THE

Pharmaceutical Journal

AND

Transactions.

THIRD SERIES.

VOLUME I.

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INTRODUCTORY.

Hard upon thirty years ago the first number of the 'PHARMACEUTICAL JOURNAL' was printed for "the purpose of circulating information respecting the nature and objects of the Pharmaceutical Society . . . the Editor solicited the support and assistance of his friends in the supply of scientific articles." That Editor was Jacob Bell; and, in his zeal to advance his order, he determined to continue the publication until he saw his way clear to "propose the establishment of a monthly or quarterly journal of pharmacy."

The soil on which he proposed to work had always lain fallow; there might be, and were, cultivated spots in the land of pharmacy, but so hedged in as to be utterly useless to all save their owners: there were no highways through which their produce could be carried, no courses through which their pleasant waters could escape to fertilize the surrounding fallow.

Bell's Journal furnished the needed outlet, and at the end of six months he found that the influx of scientific papers and other matter had increased to such an extent that it was difficult to restrict the dimensions of each number within the prescribed limits. Chemists and druggists found the advantage of a periodical interchange of ideas, and the old notion, that they were the most exclusive of Englishmen as regarded each other, was happily dispelled.

Through eighteen years Bell laboured and was rewarded by success,—the advancement of pharmacy and the elevation of pharmacists were to him the highest of all rewards. But then came a cloud over the scene, and, in what appeared to be the full tide of his energy, the guiding spirit of the Journal and of the Society was called away. So ended the first series of the 'PHARMACEUTICAL JOURNAL.'

But living and dying, the welfare of the Pharmaceutical Society was an object of the deepest interest to its originator, and in the immediate anticipation of the close of his labours, Jacob Bell passed the copyright of his Journal over to the Society as a free gift of what had become a valuable property, accompanied by suggestions for its maintenance, founded on the experience of the past eighteen years,—suggestions of dangers to be avoided as well as objects to be pursued.

THIRD SERIES, No. 1.

The Council on whom, as trustees, the duty of publication was thus conferred, resolved unanimously to carry out their work in the manner indicated by Mr. Bell, and accordingly secured the services of those gentlemen who had from the commencement been his coadjutors, to co-operate with a Committee, consisting of the President of the Society for the time being, Mr. Morson, and Mr. Daniel Hanbury: thus the second series of the Journal was commenced, which ended last month on the completion of its eleventh volume.

Other members of the Council were afterwards added to the Publication Committee, but twelve months since it was deemed that single responsibility was better than divided authority for such work. The Journal seemed to lack that unity of purpose and independence of tone which it had possessed originally; and when we remember that Mr. Bell, as sole proprietor, was responsible to no man for its contents, it is easy to account for the absence of a certain amount of spirit which had in his day characterized its articles.

As proof, however, that the interest of the work has not flagged, we may point to the resolution just arrived at, to alter the monthly to a weekly issue, in accordance with which we this day send forth the first number of the third series.

Various circumstances combine to render this change desirable; the enlarged sphere of operation which has been accorded to the Pharmaceutical Society by recent legislation; the great extension of the Society, but chiefly the greater demand for such information as it is our province to convey in these pages,—a demand first engendered, and since increased by the 'PHARMACEUTICAL JOURNAL' itself, an appetite increased by the food supplied. We believe, could Jacob Bell look down on the present condition of Pharmacy in Great Britain, he would say, "Well done!" He would say, too, "Go on, but ever remember the principles on which we founded our Society and its Journal; let private interest find no place among you; love of science has increased immeasurably in the minds of Chemists and Druggists, let the special sciences of our trade have due space accorded to them; but fail not also to remember that we have still *a trade* to care for, and let not the questions concerning that trade be overlooked; let Pharmaceutical ethics be inculcated on broad general principles, and trouble not yourselves, except in flagrant cases, with private modes of conducting business; the Journal is the property of the Society, and should ever be mindful of its interests, but, although the organ, it must not sink into the mere tool of the Council. One point more: if you would secure for the Journal an increase of that distinct influence which it is surely exercising upon public opinion generally, and on the opinion of the medical profession particularly, be sure that those who are immediately concerned in conducting it are so independent that, whilst they realize their responsibility for all that may be admitted to its pages, they may have ample play for the exercise of those honourable motives which are too often, under like circumstances, hampered by unnecessary restrictions; in fact, unless its Editor be independent, it will be impossible to ensure unity of aim and purpose."

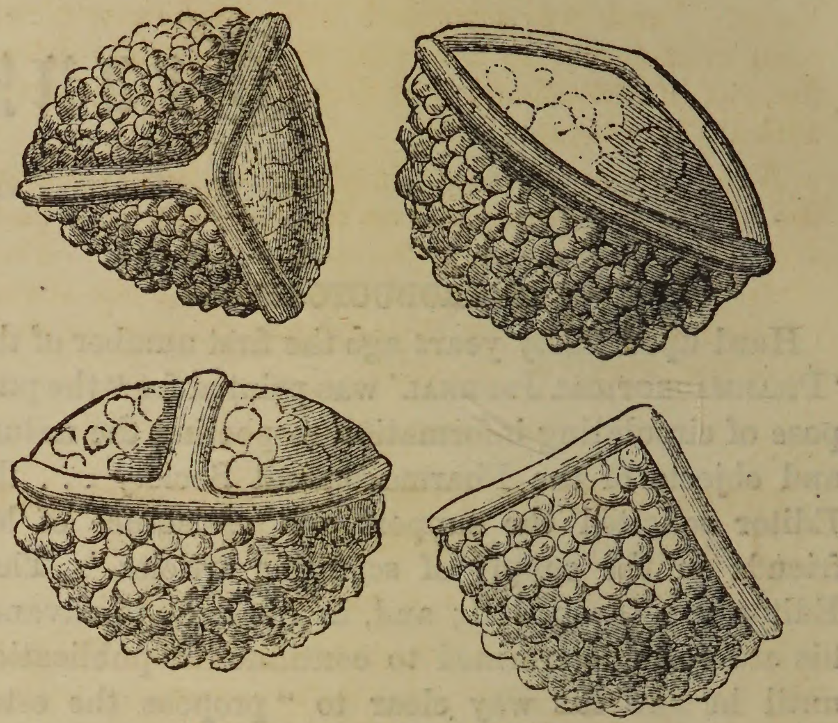
HASAN-i-YUSAF.

BY M. C. COOKE.

One of the obscure substances occasionally and locally employed in India for medicinal purposes by the natives is known by the name of "Hasan-i-Yusaf." This is seldom mentioned, and does not appear to be generally known in India itself. Lahore, and probably Kashmir, seem to be almost the only places where it has any reputation, and for what diseases it is supposed to be a remedy we have no information. After some ineffectual attempts we at length succeeded, through the kindness of Dr. J. L. Stewart, in obtaining a sample of this drug by post from Mr. B. Powell, of Lahore.

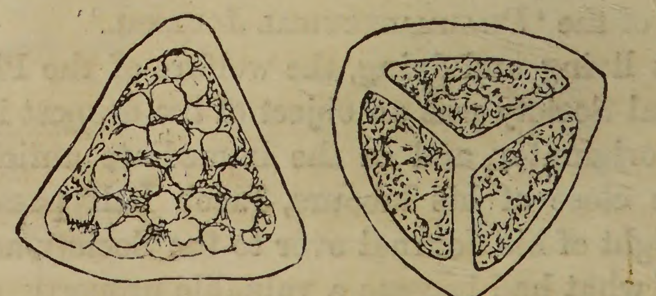
The description of this substance given by Honigberger in his 'Thirty-five Years in the East' is very brief. "Hossen Jussif," he writes, "is officinal in Lahore. It is a whitish seed of the smallest size, very likely to be mistaken for unripe poppy seeds." In reference to this, there is a note in the 'Handbook of the Economic Products of the Punjab' (p. 384), to the effect that the "Hasan-i-yusaf is a minute, siliceous shell of a triangular form, found floating on lakes and ponds in the hills of Kashmir, whence it is skimmed off and dried. Erroneously described by Honigberger and others as a seed." A little more explicit information on the same subject is given in another portion of that work (p. 320). Repeating the name as "Hussan Yusuf," it states:—"This is a very interesting specimen of the siliceous frustule of one of the *Diatomaceæ*. It is of a pyramidal form with a convex base, and on each triangular face is a prominent, rounded knot. These markings are not affected by acids, and remain after heating to redness. When heated in a reduction tube, it gives off a peculiar smell and combustible gas, showing that it is quite in a fresh state, otherwise it appears somewhat similar to a fossil. 'Hussan Yusuf' is collected in lakes and ponds in the hills around Srinagar, in Kashmir. It floats on the surface, and is skimmed off and dried."

A momentary glance is quite sufficient to convince any one practically acquainted with the *Diatomaceæ* that this white granular powder is not composed of diatoms, and has no affinity with the *Diatomaceæ* whatever. It was suggested that it might be foraminiferous, to which there is a greater resemblance. Fortunately we sent a little to Dr. Henry Carter, F.R.S., who was well acquainted with microscopic objects in India, and foraminifera in particular. This gentleman at once suggested its affinity with the spores of



"Hasan-i-Yusaf" from Kashmir.

Selaginella, and furnished for comparison those of *Selaginella cernua*, referring at the same time to the figure at page 436 of the 'Micrographical Dictionary.' The spores of *Selaginella* are almost identical in size, but more globose, less definitely ribbed, and, although allied, are not alike. Keeping in view the place at which this substance is said to be collected, "from the surface of lakes," it occurred to us at once that some species of *Isoëtes* would be the probable source. There being a family relationship between *Selaginella* and *Isoëtes*, it seemed probable that the spores of *Isoëtes* would resemble those of *Selaginella* and the "Hasan-i-Yusaf." A reference to the figures of the fruit of *Isoëtes capsularis*, in Griffith's 'Icones Plantarum Asiaticarum,' part 2, plates 116 to 118, has confirmed the opinion that the curious substance, instead of being a diatom, consists of the macrospores of a species of *Isoëtes*, allied to, even if not identical with, the *Isoëtes capsularis* of Roxburgh, or the common European species. Especially should figure 4 of the 116th plate be compared with the "Hasan-i-Yusaf." It is, moreover, perfectly true that this substance does not appear to be at all influenced by contact with cold nitric acid; and even when subjected to boiling in acid, very slow and gradual, as well as imperfect, disintegration takes place, unless the spores are first broken up. This fact, however, is by no means fatal to the conclusion that they are *Isoëtes* spores, in which, if



Spores of *Isoëtes capsularis* from Griffith's 'Icones Plantarum.' Facsimile from Plate 116.

we mistake not, a similar result will accrue, at least, if we may judge from the treatment of *Selaginella* spores with cold acid.

It only remains to ascertain what species of *Isoëtes* is found on the lakes of Kashmir, and to compare the spores with this substance. The form, texture, porcellanic appearance, resistance to acid, place, and mode of collection, affinity to *Selaginella*, and agreement with Griffith's figures, all indicate one source, which we have indicated, for the "Hasan-i-Yusaf;" and we commend this explanation with some confidence, as removing the chief difficulties in the way of identification of this mysterious substance with its botanical source.

Note. Since writing the above we have consulted the 'Flore d'Algérie,' and on the 36th and 37th plates find excellent figures of the spores of *Isoëtes*. Those of *Isoëtes velata* are almost identical with the Hasan-i-Yusaf, and leave not the slightest ground for doubt as to the source of the latter.

FATAL CASE OF POISONING WITH CHLORAL HYDRATE.

BY J. F. BROWN.

At the present time, when the last new and fashionable remedy—hydrate of chloral—occupies so large a share of our attention, and we are very frequently called upon, both by the medical profession and the public, to answer inquiries respecting it, the following particulars can hardly fail to be interesting.

Their consideration, too, may prompt scientific men to pursue what appears to me a highly important inquiry, viz. what means exist for counteracting the effects of an excessive dose of this substance, now so extensively used.

It appears that Mrs. —, a married lady, about 59 years of age, had suffered from sleeplessness and mental agitation, and that her husband, on their quitting England, had procured an ounce bottle of the hydrate, with the view of trying its effect, and fearing that in the Continental capital to which they were proceeding, there would be a difficulty in obtaining it.

Suffering greatly from want of rest, she became very solicitous to carry out their intention, but her husband deemed it prudent to consult first a local physician. This was done, and he promised, on seeing her in consultation with an eminent professor, to send a mixture or potion containing the desired remedy. But scarcely had he quitted the room than she obtained possession, by opening a drawer, of the bottle which they had brought with them; finding, probably, some little difficulty in removing the lumps from the bottle, she placed the latter in a glass, and dissolved or washed them out by pouring into it successive quantities of water, finally swallowing in this way the whole or very nearly the whole of its contents. On his return from taking leave of the medical attendant, Mr. — learnt from his wife what she had done, and being alarmed by her saying, "I feel so ill," he started instantly to recall medical aid; so quickly, indeed, had all this passed, that he overtook the physician while descending the last flight of stairs of their hotel.

The remedies applied were an emetic, hot mustard poultices to the chest, and *bleeding from the arm;* but although these were promptly used, they were ineffectual, as the unhappy lady expired within an hour.

These circumstances were related to me by a gentleman intimately acquainted with the deceased lady and her husband, and I have only, in conclusion, to express my indebtedness to him for the permission to make them public.

Dover, June 23rd, 1870.

UNGUENTUM SABINÆ.

BY T. H. BATEMAN.

To judge from the limited demand for this ointment, it does not now find much favour among the medical profession generally, although, in the opinion of some eminent surgeons, forming one of the best external irritants and escharotics we have, acting much more efficiently in keeping open blisters, etc., than does the ung. elemi of the British Pharmacopœia, which, to some extent, has taken its place.

Looking at this ointment from a pharmaceutical point of view, it is exceedingly unsatisfactory; the specimen I have before me (supplied by a London wholesale house) is perfectly rancid, and resembles in appearance "old green elder ointment."

Dr. Royle says, "When made in a porcelain vessel, or a water-bath, it is of a yellowish-green colour, efficient and active, and will keep good for a long time," which it certainly does not, as far as my experience goes.

The B. P. orders fresh savin-tops, collected in spring, to be used, thus compelling manufacturers to make their year's stock at once, which is decidedly objectionable, as it is thus frequently sent out rancid. Although this condition does not in any way interfere with its effect as an irritant, yet it prevents its coming under the category of "elegant preparations."

Pharmaceutists (excepting those in a large way) are in the habit of trusting to their wholesale druggists for it, the demand, as a rule, being too small to justify their making even the quantity ordered in the Pharmacopœia; besides, made on a small scale, it is exceedingly wasteful, the savin-tops being so bulky as to render it difficult to strain the ointment from them.

For satisfaction's sake I have prepared some myself, adopting the following somewhat modified formula, which differs only from the B. P. in the addition of gum benzoin :—

Fresh Savin-tops (bruised)	8 oz.
Yellow Wax	3 oz.
Prepared Lard	16 oz.
Gum Benzoin (coarse powder)	1 oz.

Melt the wax and lard on a water-bath, add the gum benzoin, and digest for half an hour, constantly stirring, then add the savin-tops, and further digest for twenty minutes; lastly, strain with pressure through calico or flannel, stirring occasionally until cold.

Resulting ointment, pale yellowish-green, with the odour of savin distinctly marked, which odour I have failed to detect in most, if not all bought specimens. The addition of gum benzoin (judging from its preservative effect on other ointments) will, in this case I hope, tend to prevent any decided change from taking place.

Manbey Grove, Stratford, June 2nd, 1870.

CHLORIDE OF ETHYLIDENE.

It is curious to observe how, occasionally, medicinal agents which have been used, reported on, and laid aside, crop up again. This week the daily papers report from Berlin that Liebreich has been employing as an anæsthetic the chloride of ethylidene—that is, the monochlorinated chloride of ethyle, with which Dr. Snow made us familiar nineteen years ago. Some of our most eminent surgeons, Mr. Bowman, Sir W. Fergusson, Mr. Henry Lee, and others, operated on patients under this agent, and there was almost an unanimous opinion in favour of it, Snow himself being peculiarly impressed with its safety. The chloride when pure boils at a temperature a few degrees lower, and has a lower specific gravity and a lower vapour density than chloroform. It has a higher boiling-point, a higher specific gravity, and a higher vapour density than bichloride of methylene. Its composition is $C_2H_4Cl_2$; chloroform is $CHCl_3$; and bichloride of methylene is CH_2Cl_2. It is isomeric with Dutch liquid, but differs in boiling-point. The dose required to produce deep anæsthesia is about half an ounce. The notice of monochlorinated chloride of ethyle recalls to us the remembrance that our distinguished countryman, Snow, was suddenly seized with his fatal illness while in the act of writing on this agent. He was drawing near to the conclusion of the chapter in his work which treats of this subject, when in the middle of a sentence he wrote his last word on the page—the word was "exit."—'*Medical Times and Gazette*,' *June* 11*th*, 1870.

ON THE USE OF TINFOIL FOR PRESERVING SUBSTANCES LIABLE TO CHANGE ON EXPOSURE TO AIR.

BY ERNEST BAUDRIMONT.

Tin reduced to thin sheets has for many years been employed for preserving a great number of substances from the action of air and moisture. The thin leaves (foil) of this metal are essentially repellent of moisture. When cemented to the surface of damp walls, they protect the paperhangings which may be afterwards applied, and they are in like manner used for lining the interior of boxes and drawers in which dried medicinal leaves and flowers are kept. It has long been the practice to enclose chocolate in tinfoil, to prevent the fatty matter contained in it from soiling the paper which forms the outside wrapper; in the same way butter of cacao itself is preserved, and some sorts of sweetmeats, sausages, and cheese are among the articles similarly protected. Tobacco-pouches are lined with tinfoil to preserve the flavour and humidity of the tobacco. Cakes of opium are kept in a moist and uniform state by wrapping them in this material, and bisulphate of soda is kept in the same way, for use in making artificial Seltzer water with Briet's apparatus. Lastly, on account of the opacity of tinfoil to the rays of light, bottles are coated with it for the purpose of excluding light from vegetable substances which would be injured by its action.

Notwithstanding the knowledge of all these facts, it might be said that the application of tinfoil for the preservation of substances liable to change is still rather limited, and there seemed to be a prospect of its admitting of a more general use than has hitherto been made of it. At the same time there was an absence of any precise experiments for the purpose of determining in a scientific manner the degree of impenetrability of tinfoil. Having been engaged for some time in the investigation of this subject, I have obtained the following results:—

For many years past I have observed that cacao butter, which readily becomes rancid even when kept in bottles into which it has been introduced in the melted state, if the bottles be opened from time to time, does not undergo the same change when moulded in tablets and wrapped in tinfoil. This fact, which was confirmed by many observations, and could only be explained by assuming the impenetrability of tinfoil to atmospheric air, formed the starting-point for some experiments in the same direction, which proved satisfactory. Thus, a piece of well-burned quicklime, enclosed in a double wrapper of tinfoil, was exposed in the atmosphere of the laboratory by the side of another similar piece which was exposed without protection. While the latter became slacked, that which was protected by the tinfoil, and weighed 92·2 grams on the 1st of December, 1867, had only gained 3 decigrams in weight at the expiration of a month, and after being kept until the 25th of March, 1868, it had only increased to 94 grams. It had thus gained only 1·8 grams in four months. On being then taken out of its metallic envelope much heat was developed from absorption of moisture, and it fell into powder.

Satisfied by this experiment of the efficacy of tinfoil for preserving bodies from the action of air and moisture, it seemed probable that substances the most susceptible of change might be kept in the same way. It was found that substances so deliquescent as chloride of calcium and liver of sulphur, and efflorescent salts such as carbonate and sulphate of soda, remained almost unchanged when wrapped in tinfoil, increasing or diminishing only to a few thousandths of their weight in several weeks.

Other experiments were made of a more precise character. It is well known that fresh lemons become rapidly dried and ultimately hard when exposed to the air, and that they also become perished and covered with mould. I had endeavoured to prevent this drying and moulding by placing the lemons in close vessels, in dry air, in sand, and also in bran, but none of these methods proved efficacious. Thus, for example, in twenty-one days the lemons lost on an average, 17·33 per cent. of their weight in sand, and 17·13 per cent. in bran. Experiments were made for the purpose of ascertaining the effect of enveloping the fruit in tinfoil, and also of coating it with a film of collodion. Some of the fruit prepared in each way, and some unprepared, was weighed, exposed to the air, and again weighed at intervals of a month. This method was applied to lemons and oranges, and the following results were obtained:—

1. The unprepared fruit became rapidly dried. In two months the lemons had lost 42 per cent. of their weight, while the oranges, in the same time, had lost only 26 per cent.

2. Collodion, when applied to the fruit alone, exerted but a feeble preservative influence in retarding spontaneous evaporation. In two months lemons coated with collodion had lost 29 per cent., and oranges 22·5 per cent.

3. Tinfoil almost entirely prevents the drying of the fruit. In two months lemons lost only 1·58 per cent., and in three months 3·16 per cent. In one case, indeed, the loss was only 0·92 per cent. during the longer period. Oranges lost about 5 per cent. in two months. On the removal of the metallic envelope, the fruit was found to be as fresh and fragrant as when the experiments were commenced. These observations and experiments will tend to show the remarkable power of tinfoil in preserving substances enclosed in it from the influence of air and moisture derived from air, and may induce those who are interested in the subject to extend the application of this preservative means.—*Journal de Pharmacie et de Chimie.*

EFFECT OF BISULPHIDE OF CARBON ON WOOD.

Bisulphide of carbon, according to Sidot, renders wood very sonorous, and makes it an excellent conductor of heat and electricity. Sidot passed vapours of bisulphide of carbon over pieces of wood in a porcelain tube, first in the cold, in order to expel the air, and then at high temperature, the tube being slowly and gradually heated for an hour until it was red-hot. The various kinds of wood yield, by this treatment, a coal which is not surpassed by the most sonorous substances known. Sidot made a bell of oak wood, and subjected it to this treatment with bisulphide of carbon. The sound it gave after the process compared favourably with that of a metallic bell of equal diameter. The hardest kinds of wood seem to produce the purest and most harmonious tones. On account of its capacity of conducting heat and electricity, Sidot recommends the coal prepared in this manner for use in Bunsen's galvanic batteries, and for pencils for the electric light. Such pencils give a much intenser light than those made from the graphite of gas-retorts; they become gradually white-hot throughout their whole mass, without burning at a single point, and cool down immediately as soon as the fire is removed. Linen, hemp, cotton, paper, and silk behave similarly to wood, and the action of methylated spirits (wood naphtha), hydrocarbons, etc., resembles that of bisulphide of carbon. The coal from wood has superficial metallic lustre, is denser than common charcoal, and has a greater absorbing power for gases.—*Journal of Society of Arts.*

CULTIVATION OF IPECACUANHA IN INDIA.

The Supplement to the 'Gazette of India' of 23rd January, 1869, contained a strong representation to Government from the Inspector-General of Hospitals, dated 5th October, on the advisability of introducing the cultivation of the ipecacuanha plant in an analogous manner to that of cinchona.

The suggestion was forwarded to Dr. Anderson, the Superintendent of the Botanical Gardens, Calcutta, who stated that he had, for some years past, thought of the subject, but had been unable to procure any plants on trial until April, 1866, when one plant was sent out overland by the Director of the Royal Gardens at Kew. This original plant died soon after arrival, but, at the date of his writing, December, 1868, nine plants were in existence, artificially propagated from the original one, besides five growing at the cinchona plantations at Darjeeling, to which place a cutting had been sent in 1867.

The 'Indian Medical Gazette,' on the authority of Mr. Clarke, now acting for Dr. Anderson, quotes the remarks of that gentleman:—"When I took charge of the Gardens, in 1869, there were seven plants, all under glass, and in a very low state of vegetation. The plant had been found to grow very slowly, and, moreover, to be very shy of propagation by cuttings.

"It is very possible that when the plant once gets up, it may not prove slow-growing, and that when we once have plants that seed, it may not prove slow of propagation; but I fear many days will elapse before any produce is likely to be obtained."—*The Medical Press.*

PRODUCTION OF SOLID MANURE FROM SEWAGE.

The A B C Process.

One of the most important economic and sanitary questions of the day is that of the best means of utilizing the sewage of towns. It has occupied the attention of many eminent men among chemists, agriculturists, and engineers, and numerous processes have been suggested with a view to its solution, some of which are now undergoing extensive practical trial. Among these is the process commonly designated the A B C process, by which sewage water is deprived of most of its impurity, which is separated in the solid state, and rendered fit for use as manure, while the residual water is said to be so far purified as to be incapable of polluting the rivers it may be allowed to run into. Although it cannot be said that the purifying effect of this method of treating sewage water has been proved to be sufficient, there are many who believe in it, and still more who are interested in the trial, and wish to be acquainted with the details of the process. The following description, which has been published in the 'Engineer,' relates to the works recently erected at Hastings. It has evidently been written in the interest of the Company by whom the process is carried out, and some of the statements should therefore be received with a little reservation; but it serves, nevertheless, to explain the general nature of the operations:—

"The beauties of Hastings are too well-known to seaside visitors to require description here, and we will therefore at once take our readers to the beach, where the works of the Hastings Sewage Manure Company are situated, and where they are carrying on the 'A B C' process of utilizing sewage. We may premise that this name has been given to the process from the initial letters of the principal ingredients used in deodorizing and precipitating the sewage, viz. alum, blood, charcoal, and clay; other less important chemical materials are used, but the effect produced by the mixture with the sewage causes its instant deodorization and precipitates a manure which has been appropriately called native guano, and by which all the well-known valuable manurial qualities of sewage are retained, and the whole is converted into a dry portable manure, something similar in appearance to, and with many of the valuable properties of, Peruvian guano. Leaving the railway station and proceeding along the beach road, and passing in front of the old esplanade to the extreme eastern limit of the town, we come upon the works of the sewage company. These are situated close under the overhanging cliffs, which are 220 feet high, under which they seem to nestle, and from the neatness of the elevation of the buildings, form no unappropriate and unsightly termination to the seabeach.

"The elevation consists of a two-storied building of red, relieved by bands of black and yellow bricks, with simple windows with Gothic heads. The roof is of corrugated iron, and from the side nearest to the cliff springs up a chimney 65 feet in height, of good proportions, and giving a very effective finish to the whole.

"Entering by the western door, the visitor is first struck by the line of iron pillars supporting the drying floor, between which the eight centrifugals used for drying the manure, each with its accompanying engine, may be seen. Passing between these, we will take the visitor to the spot where the sewage first enters the works, and will do our best to describe the process which so quickly converts this offensive substance into clear water and into valuable manure.

"The sewer is egg-shaped, 6 feet by 4 feet, and conveys the whole sewage of Hastings. This is received into a square chamber, 13 feet by 10 feet, in which an agitator revolves at great speed, not only to thoroughly mix the 'A B C' with the sewage, but to tear up all extraneous and heterogeneous matters which are brought down the sewers. On one side of this agitating pit are two smaller pits to contain the 'A B C' mixture; these are used alternately, and in them the various chemicals above mentioned are mixed with water, and also stirred up by an agitator.

"A chain of endless buckets delivers this mixture into the agitating chamber, where it is thoroughly stirred with the sewage. In less than a minute the chemical part of the 'A B C' process is over, deodorization has taken place, the solid part of the sewage has curdled into flakes, and the remainder of the process is entirely mechanical. The sewage thus treated then flows into the settling tanks, originally built by the local board of Hastings some years previous to the sewage company commencing their operations. The size of the original tank was 214 feet long, 100 feet wide, and divided by seven lines of piers, which carry arches in the direction of its length, the crown of these arches being a few feet below the level of the beach. The reason for the tank being covered in this instance is owing to the tank being below the level of the sea, and as the sewage can be pent up during the hours of high tide. Under other circumstances the company would have preferred to put up tanks of their own construction, open to the air, so as to admit of the oxidization of the effluent water, the process being entirely free from all disagreeable odour from the moment the 'A B C' process touches the sewage.

"The tank is divided lengthwise by a wall, each portion being used alternately. The sewage, treated as previously mentioned, remains quiescent, allowing the solid particles of both the previously soluble and suspended matter to settle. At the end of the tank nearest the sea, an angular brick weir, about 4 feet high, encloses the outfall. It is pierced by falling penstocks or sluices, which can be regulated as becomes necessary. Over this the effluent water flows to the outfall sewer, consisting of a line of 4 feet cast-iron pipes, carried out nearly a quarter of a mile to the eastward to low water.

These iron pipes, constructed and laid out at an enormous cost—a relic of the old system of discharging sewage into the sea,—are entirely unnecessary to the 'A B C' process. This effluent water is perfectly clean and inodorous, and is the only part of the Hastings sewage which is allowed to escape, thus preventing all future pollution to the neighbouring bathing beach. At Leamington, where the 'A B C' process is also in operation, the effluent water runs into the river Leam so free from impurity that it has been declared by Dr. Letheby to be practically innocuous.

"Having thus followed the process to the discharge of the effluent water, we will now return to the remaining and most important part of the operations, viz. the manurial part of the sewage. The mud deposited at the bottom of the tanks is pumped through a 6-inch iron pipe, direct into the centrifugal or into a storage tank as may be required. The adoption of these centrifugals to the purpose of drying the manure is one of the most interesting features of the process. They are eight in number, each worked by an attendant engine of 4-horse power, and which have all been christened by the names of, we doubt not, some favourites among the fair sex, as seen by the plates attached, Mabel, Maggie, Edith, Harriet, etc. They consist each of a circular wire gauze basket, 40 inches in diameter, enclosed in a cast-iron case of about 2 feet in depth, rotating on a powerful spindle and driven by means of a band round the fly-wheel of their respective engines, at the rate of about 1200 to 1500 revolutions per minute. Through the gauze of these the moisture of the mud is driven off by centrifugal force, leaving a partially dried solid deposit on the sides of the basket. The moisture or water thus driven off is returned to the agitating pit, to assist in re-treating fresh sewage.

"The solid manure is then removed to the acidifying chamber, where it is sprinkled with sulphuric acid, the object being to entirely fix its ammonia and prevent its escape until absorbed by the roots of the plants. The gases which are generated at the moment of this mixture are conducted by a flue to the boiler furnaces, and there harmlessly consumed. Applied to one of the centrifugals is a clever self-emptying machine, which discharges the mud without hand labour in the form of a solid pipe, which will eventually be conveyed on an endless band into the acidifying chamber. From this chamber the manure is lifted to the drying room above, where it is spread to the depth of 8 inches on a steam floor, which is supplied by the exhaust steam from the various engines employed. It is first deposited on the hottest portion of the floor, and as the moisture is driven off removed to the cooler portion, thus avoiding any chance of over-heating the manure. After twelve hours, the manure, now really become native guano, is made into heaps, where it is allowed to remain until the fermentation, which immediately begins, has ceased. By this fermentation all animal life, such as entozoa, tape-worm eggs, etc., is entirely destroyed. The manure is then lifted and put into bags ready for the farmers' use. This manure has earned already a high reputation among them, as is satisfactorily proved by the increased orders received from the farmers who have tried it. Its price, delivered at any railway station in England or Wales, is now £5 per ton, whilst we believe its cost does not exceed 30*s*. The demand for it has been so great at the Leamington works, we were informed lately, when on our visit of inspection, that it has been found impossible to meet it, and orders that would exhaust the supply until the autumn are still unexecuted. An engine of 16-horse power nominal, which drives the pump of the agitators, was constructed by Manlove, Alliott, and Co., of Nottingham, who also supplied the centrifugals and their engines. The pumps, shafting, and piping are from the works of Mr. Thomas Middleton, of Southwark. The contractor for the building was Mr. John Howell.

"The plans were designed by the managing directors of the Native Guano Company, and executed and carried out by their staff, assisted by Messrs. Ellis and Birch, of Westminster. We were surprised to hear how quickly these works have been erected, manure having been actually made within seven weeks from the issue of the contracts."

The Sulphur Beds of California.—Sulphur has been chiefly supplied from the sides of Mount Etna, in Sicily, but the works on the shore of Clear Lake produce now four tons a day. The Sicilian brimstone costs in California 4 cents per lb., but the domestic article is sold for 3½ cents. Clear Lake occupies the crater of an extinct volcano, and the evidences of volcanic action abound in the vicinity. Within a triangle of about twenty-five miles to the side there are volcanic scoria, trap, lava, obsidian, tufa, warm springs, and other remains of eruptions, with signs of subterranean heat not far from the surface. The sulphur bed of Clear Lake consists of a bank resembling ashes, containing numerous alkaline and sulphur-springs with vent-holes, from which sulphurous fumes escape. Pure sulphur crystals deposited from the fumes surround these holes. The earth, containing about 50 per cent. of sulphur, is placed in an iron retort heated to a high temperature, so that the sulphur is driven off in fumes into a receiver, where it settles in a liquid form, and runs out into pine boxes 2 feet long and 1 foot square. The lump sulphur is used chiefly for making powder and sulphuric acid, which last is employed in making bluestone, giant-powder, nitric acid, and muriatic acid, and in refining gold and silver. The consumption of sulphuric, nitric, and muriatic acids on the coasts amounts to 2,000,000 lb., and the entire demand is supplied by home manufacture. Flowers of sulphur have also been produced at Clear Lake. The fumes passing off from the retort are in this case led into a large cool chamber, where they condense into a flaky snow-like condition.—*Scientific Opinion.*

Immunity of Monkeys to Strychnia.—In a former number of this Journal we recorded a case in which a monkey was found to be perfectly insusceptible to the action of strychnia. This subject has been investigated by Dr. Theobald Ringer, and the results have been published in the 'Indian Medical Gazette.' The following facts have been elicited:—1st. That the "lungoor" may be said to be proof against strychnia; 2nd, That the "pouch-cheek" monkey is susceptible, but not so readily as a human being; 3rd, That the old saying that a monkey will never eat anything that is "poisonous" is clearly shown; the "lungoor" readily eating and relishing the strychnia, which produced no ill effects upon him, whilst the "pouch-cheek" monkey refused the same, and fell a victim to the poison.

A New Insect Poison.—M. Cloez considers the following to be a complete annihilator for plant lice, and other small insects:—Take 3½ ounces of quassia chips, and 5 drachms of stavesacre seed powdered; these are to be put into seven pints of water, and boiled until reduced to five pints. When the liquid is cooled, strain it, and use with a water-pot or syringe.

The Pharmaceutical Journal.

SATURDAY, JULY 2, 1870.

THE 'LANCET' AND THE MUTUAL MEDICAL AID SOCIETY.

We are glad to find that the leading medical journal has taken up the subject of co-operative trading as applied to the medical profession. There is no doubt that the Mutual Medical Aid Society, to which we alluded in our last number, would affect medical men much more than pharmacists; for although it is proposed that medicines as well as advice should be supplied to those who subscribe to the association, yet the subscribers would, in most cases, belong to the class of persons who generally get advice and medicine together from a general practitioner. But, admitting that our members would probably not be directly affected by the particular institution referred to, to so great an extent as others, still the influence of this extension of a system from which chemists are already suffering would be felt as an aggravation of the evils they have so much cause to complain of. The 'Lancet' denies the statement which had been made in one of the daily papers, to the effect that the proposal to establish a Mutual Medical Aid Society had received the sanction of the medical profession, and says "the exact contrary is the case."

Referring in a subsequent article to a statement in the 'Graphic,' that, if the Mutual Medical Aid Society is not really self-supporting, persons of honourable feeling, however strained in means, would shrink from associating themselves with it, while, on the other hand, if it is self-supporting there could be no reason for refusing any one desirous of subscribing, —for why should persons of unlimited means pay more for services than the market value?—the 'Lancet' very justly observes, "We would advise the eminent medical promoters of this trading scheme to look out sharply for their own fees. How do they know that the Committee will not begin by putting up the posts of consulting surgeon and physician to public competition, in order to ascertain the market value of the commodity they require? Such a competition might not add to the dignity of the profession, but it would perhaps enable us to estimate the value of consultees from a trading point of view."

THE TREATMENT AND UTILIZATION OF SEWAGE.

Many of our readers are no doubt aware that a Committee, appointed by the British Association, "to report on the treatment and utilization of sewage," has been in operation for some time. It was first appointed in 1868 at the meeting of the Association at Norwich, and was reappointed last year at Exeter. The subject was considered by the Association to be one deserving of a thorough investigation, but this would necessarily involve considerable expense for experiments, especially analyses; and as the Association has no funds adequate and available for such purpose, an appeal was made to the various municipal authorities and other governing bodies officially interested in the subject, for the funds required for the investigation. It appears that a sufficient amount to defray the expenses has thus been raised, and the Committee, comprising men eminent in their respective departments, and possessing the requisite engineering, chemical, medical, and agricultural knowledge, to qualify them for such an inquiry, have already obtained much valuable information, especially with reference to the methods adopted in most civilized countries of dealing with town refuse, and with reference to the engineering questions involved in methods that have been adopted or suggested. Much of this information was obtained in the first year of the Committee's operations, with a grant of only £10, but, with the accession of much larger funds, disagreement has arisen among the members of the Committee as to the method of doing and paying for the work.

It appears that a majority of the Committee have decided that the independence and disinterestedness of the members of the Committee should be placed beyond suspicion by their duties being of a strictly honorary character, and all paid work being obtained from without, while two of the chemists in the Committee differ on this point, and contend that it would be perfectly consistent with their position, and conducive to the interests of those who have contributed the funds, that the chemical work should be done under the guidance and supervision of chemical members of the Committee, to whom mere working expenses should be paid.

Both of these appear to be legitimate modes of proceeding under special circumstances, the nature of which may determine the preference for one or the other, and it is much to be regretted that the successful issue of an important investigation should be endangered by a public dispute on such a question.

SALE OF POISONS (IRELAND) BILL.

The Bill for regulating the sale of poisons in Ireland, which, as introduced in the House of Commons on the 24th of May, by the Solicitor-General for Ireland, was given *in extenso* in our number issued on the 1st of June, is now waiting a second reading in the House of Lords. It has undergone one or two slight alterations, as, for instance, in section 1, the proviso that the Apothecaries' Hall of Dublin might, with the sanction of the Privy Council, add to the schedule of poisons, has been struck out, and that power is now given to the King and Queen's College of Physicians in Ireland. In the schedule of poisons, the preparations of prussic acid, of the cyanides, and of atropine, have been struck out. With these exceptions the Bill appears to remain intact.

BETTS'S METALLIC CAPSULES.

PROSECUTIONS AGAINST RETAIL CHEMISTS.

The long-pending suits in Chancery, which were commenced by Mr. Betts about five years ago, against a number of retail chemists and perfumers, for selling articles capped with metallic capsules which the plaintiff alleged were not of his manufacture and the use of which was an infringement of his patent rights, have at last been decided by Vice-Chancellor James, and we are happy to say that the decision is wholly in favour of the defendants. The circumstances under which the suits were instituted are described at page 41, Vol. VII., 2nd series, of this Journal, and allusion has been made to the subject several times since. In our next issue we shall give an account of the trial, which has occupied two days. We can only state here that the cases were all dismissed with costs, and that the Vice-Chancellor, in giving judgment, condemned in strong terms the conduct of the plaintiff in this affair.

PROFESSOR HUXLEY ON MATERIA MEDICA AS A BRANCH OF MEDICAL EDUCATION.

In an address delivered by Professor Huxley the other day, on the occasion of the distribution of prizes to the medical students at University College, in alluding to subjects he would omit from the curriculum of medical education, the following remarks were made:—

"I must confess, if I had my way, I would abolish Materia Medica* altogether. I recollect, when I was at the University of London, Dr. Pereira was the examiner,—and you know that Pereira's 'Materia Medica' was a book *de omnibus rebus*. I recollect my struggles with that book late at night and early in the morning (I worked very hard in those days), and I do believe that I got that book into my head somehow or other, but then I will undertake to say that I forgot it all a week afterwards. Not one trace of a knowledge of drugs has remained in my memory from that time to this; and really, as a matter of common sense, I cannot understand the arguments for obliging a medical man to know all about drugs, and where they come from. Why not make him belong to the Iron and Steel Institute, and learn something about cutlery, because he uses knives? But do not suppose, after all these deductions, there would not be ample room for your activity. Let us count up what we have left. I suppose, at the outside, all the time that can be hoped for for medical education is about four years. That is taking the outside limit. Well, what have you in those four years upon my estimate? Physics applied to physiology, chemistry applied to physiology, physiology, anatomy, surgery, medicine, obstetrics, hygiene, and medical jurisprudence,—nine subjects for four years! And when you consider what those subjects are, and that the acquirement of anything beyond the rudiments of any one of them may tax the energies of a lifetime, I think that even those energies which you, young gentlemen, have been displaying for the last hour or two might be taxed to keep thoroughly up to what is wanted for your medical career; and I entertain a very strong conviction that any one who adds to medical education one iota or tittle beyond what is absolutely necessary is guilty of a very grave offence."

* "It will, I hope, be understood that I do not include Therapeutics under this head."

"AN AGE OF PROGRESS."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I beg you will allow me space in your next issue to protest against the character of one of the leading articles in your last.

I could excuse, though I could not approve the tone of some of the speakers who were borne along in the storm of debate at the annual meeting; and I could extenuate, though certainly I could not justify the conduct of a scrutineer who allowed his excited feelings to eclipse his judgment; but I can acknowledge no excuse for the publication of a leading article, professedly giving a deliberate opinion,—a calm judgment founded upon the superior knowledge of the writer,—in contrast to the ignorance and impetuosity of the bulk of the members of our Society, yet containing statements which, though partial truths, are virtually misrepresentations, and containing remarks which can only be regarded as sneering and unjust towards the men whom it professes to honour.

I could not have imagined, Sir, that an article so puerile and undignified could have fallen from your pen, nor that your judgment, which I have always held in high estimation, could have yielded a place of honour to a communication which was scarcely entitled to space in the columns of anonymous correspondence.

Were it not that the editorship is vacant at the moment I write, I would say that justice demands a public apology, and a fair representation of the case in your next number; but as the Journal in July may appear under the authority of a new editor, or, perhaps, without an editor at all, I beg to draw attention to one or two points which may enable your readers to form a more just estimate of the merits of the case than they are at present likely to possess.

In saying that Mr. Bottle has attended no committee meeting, does not justice require that the context should clearly state that he has never been called to one? The partial truth is, that he has never attended a single committee; the lurking injustice is the statement of this truth in such a way as to leave the impression that he has neglected his duty.

Might it not be said with equal truth that the London members, being in majority, elected one another to the committees, and fixed the days of meeting at such times as would not be convenient to any one at a distance? and as your article states three-fourths of the business of the Council is pre-arranged at these committee meetings, and a country member attending Council without the knowledge which committee work would give him, has no chance against his metropolitan brethren,—might we not, with equal justice, conclude that the country members of the Council were thus virtually set aside, and hopelessly helpless till their constituents had placed a majority on their side to enable them to arrange matters better, and thus to save the Society from being entirely in the hands of the London tradesmen, who form but a small minority of its members?

This is a conclusion which might be drawn from a more careful examination of the published information than that which you have offered us, and not unlikely to be arrived at by the provincial pharmacists, if party spirit is fostered by such one-sided writing being allowed to appear as official matter.

The truth is, that the country members of the Council do not feel that their distance disqualifies them for the acceptance of committee work, for they *have* accepted the same; they now *have* elected one another to work along with their London brethren in *all* the committees; they have elected *every country member* of Council to at least one committee, and two of them—Mr. Abraham and Mr. Edwards—to as many as four committees each; they have arranged the times of meeting of the committees, so that a frequent attendance of the country members will not be impracticable; and, though their presence will always involve twice as great a sacrifice as is required to be made by those residing within a cab drive of Bloomsbury, it is an injustice to condemn them before they have had a trial.

May I ask why Mr. Deane is mentioned among those who are geographically unable to attend? unless it be to mislead those, if there are such, who do not know that Clapham is an easy omnibus ride from Bloomsbury Square. And may I ask why an unfair view of the attendance of London members is given by drawing attention to those who have been many times present, and omitting to notice those who have been absent so often as to show that the geographical qualification is no guarantee of regularity?

I sought to justify this omission on the ground of your remarks having reference to members of the new Council only, but this I find is not the case, as the number fifteen applies to Mr. Morson, who is not on the present Council. Then, in the hope of yet justifying the omissions, I expected to find then the names of founders of the Society,—men who are willingly acknowledged to have earned their laurels and their ease, and would be gladly seen at a meeting without constant attendance being expected of them. But against this, Sir, I find the first name you have thus omitted is that of Mr. Ince, who has been called to the library committee seventeen times, and has attended it only once.

I can, therefore, come to no other conclusion than that you have picked out the good numbers, with the intention of implying that residence in London ensured good attendance, and omitted to notice that the London list also included two attendances in response to twenty-one summonses (Ince), two attendances in response to thirty-four summonses (Orridge), and six attendances in response to thirty-one summonses (Squire), because these facts detract from the apparent strength of your position. One would think that the first of these names, so intimately associated with ethics, should have prompted a fairer statement of the case. I can only imagine that some unfortunate circumstance disturbed your usual cool judgment when you wrote this article, or you could not have offered to your provincial friends the information that the Council is not a Young Men's Mutual Improvement Association,—a piece of information which a day's reflection would, no doubt, show you is both uncalled for and offensive; nor could you, as editor of a scientific journal, have penned a sentence implying that Mr. Brady is less worthy of our respect in consequence of his pursuit of natural history.

Barnard S. Proctor.

11, *Grey Street, Newcastle, June 24th*, 1870.

TO THE READERS OF THE PHARMACEUTICAL JOURNAL.

I wrote the Leader entitled "An Age of Progress." It has excited undue praise, but there are some who take exception to the statements it contains.

It struck me that it might prejudice the Editor of the 'Pharmaceutical Journal' were he supposed to be the author. The only part he has had in the transaction was to tone-down, modify, and materially improve my sentences, to their great advantage. I see not one syllable I wish to retract or alter: in obedience to Journal usage the article was not signed, a circumstance I regret. I define the word *Council* to prove that it is an assembly for deliberation and not at all for discussion. I object to reporting its proceedings for reasons I have given so often that I am afraid of their repetition. Amongst them are. First, conclusions are arrived at, in the main, by conversational means, perfectly legitimate but unadapted for publication. Secondly, the actual work is done in Committee, and it has happened to myself and others, that in order not to be eternally present before the board, or to gain the reputation of being heard for much speaking, I and others have used the friendly services of a councillor to bring forward our particular Resolutions. In that case, a gentleman in the Country, wishing to know his man and give his vote, is led into error. A sign post is an excellent institution but it is desirable that it should not point the wrong way. Thirdly debates do arise occasionally. I have accurately described them as a storm passing over otherwise tranquil waters. These of necessity often involve personal matters which it would be most unwise to reveal. Their publication would sow an abundant harvest of ill-will, misunderstanding and estrangement.

But this is not the point about which I am called in question. I have stated the truism that neither as I could direct the home affairs of a firm in Manchester, neither can those residing at a long distance from the metropolis conduct home London business. Fearing however that this paragraph might be misinterpreted into a slight passed on our Provincial friends, the identical sentence was submitted to the President and met with his approval. Desiring to make assurance doubly sure, I added, that these very persons were amongst the utterly best men of our Society. Was it possible to take more care? Could sentences be more guarded? Moreover the directors of this Journal and other Editors know with what elaborate trouble I prepare my press communications. Easy writing is never read. Two gentlemen in another periodical have ventured on a description of the same affair, namely the *character* of the Election. One, formerly a member of Council, (not myself) supplied the materials; the Editor did the text. Between them, they termed the transaction of the month of May, "Reaping the Whirlwind." With them, I regret the non-election of Mr. Williams.

To me besides it is a grief that Mr. Charles Savory has not been allowed to take that position to which he is so fully entitled, and to discharge the duties of which he is so admirably competent. But one thing disturbs me—that I should have been so fearfully misinterpreted as to cause a suspicion that I had raised a sarcasm at the expense of Mr. Brady. This was not particularly probable as with one exception he is the nearest friend I have, and no Pharmacist can be prouder of his scientific reputation than myself.

It is my fortune, or misfortune, in this case the latter, to be a diligent reader of French. In that language the commonest of all common things is to impute as a fault a known, acknowledged excellence. When a celebrated songstress was addressed thus, "Madame vous êtes charmante, bien que vous savez chanter," the lady did not resent as an insult the remark regarding her vocal abilities. That a pharmacist at Newcastle should be engaged in scientific pursuits or devoted to the study of Natural History, is to his highest praise. My Leader assumed this to be understood.

What is this about? I state that to appoint on Committee work those who live at considerable distances is unwise and injudicious. So it is. Should this sentiment be considered a depreciation of Provincial ability, I repudiate the notion. I am an officer and Member of the British Pharmaceutical Conference which alone would be sufficient denial. Last month I left for the next five years, the thorny path of Journalism: but I would ask the readers of this Journal not always to expect to be written to as an Infant School. Let them give and take—let them allow a man to have an opinion of his own.

Meanwhile do not visit my sins on the Editor. He was less likely to scrutinize my short essay because I was on the regular staff, and my contributions have never yet been refused. I had requested that space should be reserved for my article among the leaders, and there was little time left for deliberation after the manuscript was sent. The issue of the Journal was delayed to admit of alterations which the Editor suggested, but I am solely responsible for the article as it stands.

Nothing remains but for me to thank Professor Redwood for his courtesy and his editorial care in this instance.

JOSEPH INCE.

26, *St. George's Place, Hyde Park Corner, S.W.,*
June 25th, 1870.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

June 15th, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden, and Southall.

Thirty-four candidates presented themselves for examination; the following passed, and were duly registered:—

As PHARMACEUTICAL CHEMISTS.

*Fryer, Charles .... Guildford.
Horsley, Thomas Wood .... Manchester.
Furmston, Samuel Chambers .... Wycombe.
Tuck, William Henry .... Surbiton.

As CHEMISTS AND DRUGGISTS.

*Masson, George .... London.
*Appleby, Calvert .... East Retford.
*Powell, Thomas Henry .... Hornsey Rise.
*Pick, Richard .... Hull.
*Wing, Lewis .... Torquay.
Davison, Anthony .... Kidderminster.
Wallis, Herbert Boyd .... London.
Warren, William .... Chertsey.
Griffin, Thomas .... Bromley.
Horton, Walter Charles .... Windsor.
Browne, Joseph Alleyne .... London.
Botterill, George Thomas ...... Boston.
Goodenough, Joshua .... Norwich.
Barclay, Arthur Edward ...... Lee.
Read, Henry Holditch .... Peterborough.
Wonfor, Herbert Ison .... Southampton.
Osborne, James .... Ashbourne.
Hill, William Edward .... Leicester.
Vincent, Philip .... Fulham.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

The following, having presented to the Board certificates of examination by legally constituted Examining Bodies, and the said certificates having been approved, were registered as

APPRENTICES OR STUDENTS.

Barclay, Arthur Edward .... Lee.
Green, Marryat Hahnemann .... Peckham.
Webb, Frederick Brooks .... Birmingham.

EXAMINATION IN EDINBURGH.

May 30th, 1870.

Present—Messrs. Ainslie, Brown, Buchanan, Kemp, and Young.

Eight candidates presented themselves for the Major and Minor Examinations; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Duncan, Joseph .... Edinburgh.
Finlay, James .... Edinburgh.

MINOR (as Chemists and Druggists).

Gilmour, David .... Edinburgh.
Howie, William Lamond .... Edinburgh.
Macfarlane, Patrick .... Alexandria, N.B.
Paton, James .... Edinburgh.

MODIFIED EXAMINATION.

Seven candidates presented themselves for examination; the following six passed, and were registered as

CHEMISTS AND DRUGGISTS.

Campbell, William .... Glasgow.
Chalmers, William .... Glasgow.
Campbell, Lorne John Malcolm .. Helensburgh.
Drysdale, Robert .... Glasgow.
Greig, William, jun. .... Glasgow.
Yoxall, Henry .... Belfast.

FIRST, OR PRELIMINARY EXAMINATION.

Eleven candidates were examined; the following eight passed, and were registered as

APPRENTICES OR STUDENTS.

Gilmour, David .... Edinburgh.
Hardie, Alexander .... Edinburgh.
Macauly, John .... Helensburgh.
Macfarlane, Patrick .... Alexandria, N.B.
Macfarlane, William .... Girvan.
Paton, James .... Edinburgh.
Thomson, Charles M. .... Edinburgh.
Todrick, William .... Edinburgh.

* Passed with honours.

Provincial Transactions.

ABERDEEN ASSOCIATION OF ASSISTANT CHEMISTS AND DRUGGISTS.

The half-yearly General Meeting of the above Association was held in the U. P. Hall, St. Paul Street, on the 13th inst.; Mr. James Thorn, President, in the chair.

Mr. W. Donald, Secretary, submitted a report of the proceedings of the Association for the past six months, showing that a number of scientific and interesting subjects had been brought before the Society, and much research and ability had been displayed by those members who had contributed papers during the session. The finances were also reported to be in a very satisfactory state, and the attendance of the members has been such as to leave no doubt of the continued prosperity of the Association. During the half-year, ten gentlemen have been elected as members, making a total of fifty-two since the formation of the Society in 1868; but several of those, from various unavoidable causes, have left the Society, leaving on the roll at present forty-five members; but as that includes representatives from almost every shop in town, we have every reason to feel gratified at the success already attained.

Classes have been formed in connection with the Society under the tuition of Mr. Roy, the subjects taught being those embraced in the preliminary examination of the Pharmaceutical Society, and thirty-seven members have already availed themselves of the opportunity thus afforded them of preparing for examination.

Messrs. Thorn and Donald received hearty votes of thanks for their exertions on behalf of the Society, and the following were then elected office-bearers for the ensuing six months, viz.:—Mr. W. Donald, *President;* Mr. J. Bertie, *Vice-President;* and Mr. J. Thorn, *Secretary and Treasurer.*

LIVERPOOL CHEMISTS' ASSOCIATION.

Fifteenth General Meeting, held May 13th, 1870; the President, Mr. J. Abraham, in the chair.

Messrs. W. L. Fewster and W. Hope were duly elected members of the Association.

The President read an extract from the 'Scotsman' relative to Sir James Simpson's obligations to Mr. D. Waldie for the suggestion of chloroform as an anæsthetic. Mr. Waldie had prepared it to make chloric ether of constant composition.

Mr. Redford said that chloral seemed to act best when given in small doses. It was not of uniform quality, some having a fetid smell, which may explain the unsatisfactory results sometimes following its administration.

The Secretary read a paper recently published on "Crab-oil," a sample of which had been shown at a previous meeting. It is a vegetable oil obtained from the fruit of the *Carapa Guianensis*, and is said to be useful in rheumatism.

Mr. Jones gave the results of some experiments on the use of chloral in photography. He found that it gave considerably greater sensitiveness.

The meeting then adjourned to the tea-room, where the remainder of the evening was spent in the examination of microscopic objects.

Sixteenth and concluding Meeting, held May 26th. In the absence of Mr. Abraham, the chair was taken by the Vice-President, Mr. J. T. Robinson.

A letter was read from Dr. Symes, recommending that the Association should provide four or five books for autograph prescriptions, and offering to fill one of them himself.

Mr. Shaw proposed that the thanks of the meeting should be given to Dr. Symes for his generous offer, and that the question be referred to the Council to consider the best means of carrying out the suggestion.

Mr. Robinson seconded the motion, which was carried unanimously.

Mr. Mason exhibited a sample of artificial alizarine, beautifully crystallized, manufactured by Dr. Calvert; and Mr. Davies showed two pieces of print dyed with it.

Mr. Tate suggested that copies of the list of subjects proposed for papers at the Pharmaceutical Conference should, if possible, be distributed among the members. He thought that apprentices and others actually engaged in making preparations might give some valuable information.

Mr. Redford said that the meetings of the Association were the proper times for such communications, and that at the Conference the results of men of experience were wanted rather than first efforts.

Mr. Tate then read a paper, entitled, "Notes on Pharmacy," Part 2. The paper contained a short *résumé* of the principal discoveries or improvements in pharmacy since the beginning of the year. Referring to the "Adulteration of Food and Drugs Bill," Mr. Tate pointed out that probably medical men would be almost exclusively appointed analysts under the Act. He considered Pharmaceutical Chemists to be far more competent, and thought that the Pharmaceutical Society should carefully watch such legislation.

After a few remarks from Messrs. Robinson, Shaw, and Davies,

Mr. Robinson closed the session with some valedictory remarks. He said that as he had only known that day that he would have to supply the place of the President, he had not prepared an address, but he wished strongly to urge upon the members the necessity of greater earnestness in contributing papers for the meetings. Unless young men would exert themselves, and come forward in the place of those whose years entitled them to rest, the Association would die out, and it would serve it right. The Pharmaceutical Conference was coming, and he hoped that, by seeing and hearing men who had made a position for themselves by hard work, new life would be infused into the younger members of the Association. He concluded by expressing the pleasure which he had felt in listening to some of Mr. Davies's lectures, of which he spoke in complimentary terms.

Mr. Tate proposed a vote of thanks to Mr. Robinson, and said that he hoped to hear fuller and freer discussion at the meetings.

Mr. Redford seconded the motion, and agreed thoroughly with Mr. Robinson's remarks, thanking him for his frank strictures on the results of the session.

The vote was carried by acclamation, and the session closed.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The First Annual Meeting of the above Association was held at the Temperance Hall, Birmingham, on May 27; the President, Mr. W. Southall, in the chair.

There was not a large attendance of members.

The Hon. Sec. read the Report of the Council and Statement of Accounts, which show that the Association is of service to its members, and has a balance in hand of upwards of £12.

Report presented by the Council of the Midland Counties Chemists' Association, May, 1870.

The Council in presenting their first Annual Report to the members of this Association, prefer giving simple statements of their proceedings for the past year, and submitting the same without comment, either congratulatory or otherwise. The object of this Association being the general advancement of the interests of the trade, it will be perceived how far the Council have kept that object in view.

After three preliminary meetings, a General Meeting was held on May 7th, 1869, which was numerously attended, and there were appointed the President, Treasurer, Hon. Secretaries, and Council, who were entrusted more especially with the preparation of a Dispensing and Retail Price List. In compliance therewith the Council held no less than nine consecutive meetings, which were followed by a General Meeting, and the price list, as it now stands, was adopted and circulated to each member of the Association; a charge of 1*s*. per copy was made to non-members beyond the precincts of Birmingham.

In the course of these meetings efforts were also made to unite the members of the trade in the one common object; your Council canvassed the whole of the town, when the number of enrolled members reached just over one hundred; also, about 250 chemists of the neighbourhood were invited, by circular, etc., to join, and upwards of thirty of these sent in their names and subscriptions.

An invitation from the Pharmaceutical Conference was received and acknowledged for a deputation from this Association, but its formation being too recent, it was deemed advisable to decline. The supper at Nock's Hotel was not so well attended as desirable, but a very pleasant evening was spent by those present.

Your Council have had their attention called to the objectionable practice of a small shopkeeper vending paregoric, but on this occasion could not take further proceedings.

A deputation was appointed to wait upon the Borough Inspection Committee, relative to the exorbitant charge for the licence for the sale and storage of petroleum, under the new Act, which took place on December 22nd, 1869, and although letters were read from Liverpool, Manchester, and Bristol, stating the low terms for the licence in those places, the Borough Inspection Committee refused to make any alteration.

An appeal from the Birmingham Chemists' Assistants' Association, applying for accommodation to hold their weekly meetings, was made to the Council, when it was unanimously resolved that arrangements should be entered into with the Temperance Hall Committee to grant them the use of a room for that purpose for a period of six months, ending June, 1870. Action was also taken in unison with other Associations objecting to any legislation interfering with the storing and dispensing of poisons.

The Association has been the medium of compelling a self-styled chemist and druggist to take down his signboard, and the Secretaries, with the consent of the President, deemed it expedient to caution the members against being duped by a vendor of questionable vermin eradicator.

Your Council now retire from their duties, which they have endeavoured to carry out faithfully, and hope that their successors will be able to accomplish much more for the welfare of Chemists and Druggists, and for this Association in particular.

The election of officers for the ensuing year, and the consideration of Mr. Arblaster's letter to the Home Secretary on the amount charged for the petroleum licence in Birmingham, formed the chief business of the meeting.

Joseph Lucas, 4, Calmore Row, } *Hon. Secs.*
A. Stirling Grieves, 16, Spiceal Street, }
June, 1870.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The adjourned Annual Meeting of this Society was held at the Exchange Rooms, on Friday evening, May 27th; the President in the chair.

The minutes of the previous meeting having been adopted, the Hon. Secretary then read the following

Report.

In presenting their first Annual Report, the Council of the Nottingham and Notts Chemists' Association take the opportunity of congratulating the members upon the very satisfactory position of the Society generally, as well as financially.

The Society was established in December, 1868, for the purpose of advancing the interests of chemistry and pharmacy in the district, for providing means for the scientific education of the Assistants and Apprentices, and for the encouragement of feelings of mutual goodwill and esteem amongst its members.

The Inaugural Meeting was held at the Exchange Rooms in February, 1869.

The number of Members enrolled at and since that meeting, was 53, and of Associates, 48.

During the Session which now terminates, several very interesting papers have been read:—

On February 12, "The President's Address."

On March 12, "The evening was devoted to the discussion of the Pharmacy Act."

On April 8, Address on "Pharmaceutical Education." H. S. Evans, Esq.

On May 14, A paper "On the Results of Examination of Some Samples of Tincture of Opium." Mr. Mayfield. A paper "On Botany and its Relations to Pharmacy." Mr. Rayner.

On October 19, "Address," by the President.

On November 19, "Hints on Dispensing." Mr. R. Fitzhugh.

On December 10, "French Pharmacy." Mr. Mayfield.

On February 11, 1870, "On Accidental Poisoning and the Precautions Adopted for its Prevention, with Special Reference to the Proposed Bye-laws of the Pharmaceutical Society."

On March 11, "Adjourned Discussion on the Subject of the Previous Meeting."

On April 8, An address on "The Amusement and Recreation to be Derived from, and the Advantages Accruing to the Pharmaceutist by the Study of Botany." T. Burnie, Esq.

The meetings have afforded opportunities for the discussion of matters of interest to the profession generally,—such as the Pharmacy Act, the operations of the Petroleum Act, etc.

A deputation was appointed to wait on the Watch Committee with a view to modify the local regulations of this Act; the result of which was satisfactory.

A lengthened discussion took place on the proposed compulsory regulations respecting the keeping of poisons, and a resolution was unanimously adopted against any compulsory measures in that direction, it being considered that chemists did generally, in their ordinary course of business, adopt sufficient precaution for their own and the public safety. The resolution was forwarded to the Pharmaceutical Society. Your Council acknowledge, with gratitude, the kindness of the then Vice-President, now President, of the Pharmaceutical Society, Mr. H. S. Evans, in coming from London to deliver an address to the Society on such a subject as "Pharmaceutical Education." Such an address was very encouraging to a young Society, when coming from so high an authority. The Society, as a mark of their appreciation of Mr. Evans's kindness, honoured themselves by electing that gentleman as their first honorary member.

Amongst other donations made to the Society, not the least useful and interesting are a cabinet, containing materia medica specimens, from Messrs. Evans, Son, and Co., and a second one from Southall, Son, and Dymond. These cabinets are of great service to the students, and the Council have consented that they should circulate amongst the members for the use of the Associates, under certain restrictions.

Arrangements were made by which the collection of books, formerly in the possession of the old Society, were transferred to the new. Several valuable works, standard as well as elementary, have been added to the library, and a good nucleus is now formed, which your Council hope soon to see developed into a good reference as well as circulating library,—useful alike to all connected with the Association; and while they acknowledge with thankfulness the donations which have been made to it from time to time, your Council would earnestly impress upon members the necessity of using their utmost endeavours to add to its extent and usefulness.

The librarian announces a tolerably good circulation, which, has, however, somewhat diminished during the last few months. The Council are anxious that the Associates should avail themselves of the advantages of the library, which is even now capable of supplying them with suitable books in the various branches of science to which their attention must be called.

A petition was presented to the Council, signed by most of the Associates, praying that they might unite to form a section for their own instruction; your Council had great pleasure in complying with their request, reserving to themselves the right to direct their studies, and suggesting that a Secretary to the section should be appointed to confer with the Council in the interests of the Associates.

Mr. Overton was appointed Secretary, and your Council engaged a room in the house of the Constitutional Association, for the purposes of the section, and engaged Mr. Hughes as teacher. The section meetings have been held weekly, on Monday evenings, and a good attendance has been the result,—Pharmaceutical Chemistry and Materia Medica being the subjects appointed for study; at the completion of the course, two prizes were offered by the Council for competition, and awarded respectively to Mr. Bathamley and Mr. Johnston. Messrs. Parker and Smith kindly offered two prizes for competition amongst the younger students, which were obtained by Mr. Evan Jenkins and Mr. Ward. As an inducement to the Associates to prosecute their studies, your Council throw this course open, free of charge. Your Council made arrangements with the lecturer on chemistry at the Mechanics' Institution, in connection with the Science and Art Department, for the admission of Associates to this class at half the usual fees.

Your Council also provided a Latin Class, which has been in operation for nine months with satisfactory results. At the end of the first course a prize was presented by your Council to Mr. Johnston as being the most advanced Student, and your President presented a second prize to Mr. Copley, who passed the best examination amongst the Junior Associates. Arrangements have been made for a course of lessons on botany, which commenced in April, and will be continued weekly during the summer months. Your Council have to acknowledge with gratitude the kindness of Mr. Burnie in offering to conduct this class entirely free of charge; and also the kindness of Dr. Mills for his assistance by demonstrating to the students the wonders of structural botany by aid of the microscope. These meetings are held at the room of the Society in Friar Lane, every Monday evening, commencing at nine o'clock.

As the attendance has been hitherto rather limited, your Council would earnestly request the Associates to make every endeavour to attend this class, and the employers also to use their influence with those who are unwilling, and to extend their permission to those who are willing to study so important a branch of their business.

In conclusion, your Council hope that their work, as embodied in this report, will give satisfaction to the members and show the great use of such societies as this, and, in resigning their trust, would like to add a few words on the practical working of the Society.

In the first place, at the Monthly Meetings every exertion has been made to provide subjects for discussion which would be a means of mutual instruction.

Your Council regret that the attendance of members has been very poor; they would respectfully urge upon all the difficulty of sustaining societies like this without the presence and aid of the members.

A cordial spirit of co-operation is the one thing wanting to assure the success of this Association, and to enable the Council to carry on those works so auspiciously begun, which have already produced great results, and by which much greater are yet to be anticipated. The educational advantages have in no way been better exemplified than in the many admirable answers given by the Students in reply to the examination questions, and your Council hope that every Associate will endeavour, during the ensuing Session, to make a point of attending the various classes provided for him, as far as the exigencies of business will allow. Your Council, though thankful for what they have been enabled to do, feel that the usefulness of the Society would be much enhanced by a "local habitation" of its own, and would suggest to their successors in office, the desirability of taking a room or rooms in a central position, which might be devoted to all purposes of the Society,—as reading-room, library, class and general meeting room, where the property of the Society might be preserved, and the nucleus of a museum collected. The purchase of a good working microscope would be beneficial, and various other instruments and apparatus not frequently used, but often useful. Your Council believe that this would be a means of giving a practical value to the Society, and would tend to promote a greater personal interest and a greater personal attendance.

The Treasurer's report was afterwards read, showing the state of the Society's funds to be as follows:—

		£	s.	d.
Session 1869–70.	Receipts . . .	44	9	0
" "	Expenditure . .	30	1	1
	Balance in Treasurer's hands .	£14	7	11

It was afterwards proposed and carried that the reports be printed and circulated amongst the Members and Associates of the Society, and all chemists resident in the town and country.

After passing an alteration of the bye-laws with respect to the Annual Meeting, a cordial vote of thanks was accorded to the President, Mr. Atherton, for his services during the past Session.

The following officers were then appointed for the ensuing year:—

President: J. H. Atherton, F.C.S.
Vice-President: R. Fitzhugh, F.C.S.
Treasurer: J. Rayner.
Honorary Secretary: J. T. Mayfield.
Council: Messrs. Bailey, Jas. Jenkins, W. H. Parker, W. Smith, White, Whitworth, Waterall, and Woodward.

Meetings of Scientific Societies.

CHEMICAL SOCIETY.

The last of the Scientific Meetings of this Society for the session which has just ended was held at Burlington House on Thursday, the 16th of June; Professor Williamson, F.R.S., President, in the chair.

A paper was read by Mr. James Bell "On Fermentation," in which the author described a number of experiments which had been made for the purpose of determining what forms of ferment may be obtained by submitting albumen derived from different sources to a variety of conditions.

When egg albumen was mixed with cane sugar, and the mixture allowed to ferment at 75° F., a species of yeast was formed, consisting of fungoid cells, which differed from those of ordinary yeast, and by which only a very small quantity, 0·2 per cent., of alcohol was produced.

The albumen of flour and of malt, used in the same way, yielded results similar to those previously described, the yeast so produced having very little fermentative power.

Cold water extracts of flour and of malt, added to solution of cane sugar, with which was a little glucose, became mucilaginous, and the production of yeast-cells in this mucilage may be easily watched.

The blue mould which forms on infusion of malt, and the mould from lemon-juice, were found to act as good ferments in solution of grape sugar.

From some comparative experiments made with grape juice, to which various quantities of glucose had been added, the author concluded that the fermentation of must would be rendered more complete and exhaustive by the addition of a certain quantity of glucose.

The President, in remarking on this paper, said that, although it was usual to speak of the yeast *plant* in connection with fermentation, the organism appeared in all its functions to be animal rather than vegetable. The products of its secretion, he said, are less complex than those it takes in. Moreover, it does not, like plants, require light for its vital process; nor does it absorb heat, but, on the contrary, gives it off.

Another paper read at the same meeting was "On Organic Matter in Water," by Dr. Heisch.

The author, having been consulted by a manufacturer of lemonade, who suddenly found that all his lemonade after a few days became turbid, and acquired a disagreeable odour, found, on examining the liquid under the microscope, that it was full of small spherical cells, with, in most cases, a bright nucleus.

Further investigation of the subject led to the conclusion that the source of the evil was organic contamination of the water used in the manufacture. On putting a few grains of the purest crystallized sugar into some of the water, it became turbid in a few hours, and was found to contain the cells previously described. It seemed probable, from inquiries made, that sewage had gained access to the well, and to this Dr. Heisch was disposed to ascribe the result. Experiments were made with various samples of water, to which sugar was added, as already described; and in every case in which the water used had produced diarrhœa, or other mischief of that sort, when employed as a beverage, on treating it with sugar, the characteristic cells were developed, usually within twenty-four hours, the temperature being kept at 60° or 70° F., and light freely admitted to the liquid. A minute quantity of sewage itself was added to a solution of sugar, which had been previously ascertained to be free from the cells, and the solution was soon afterwards found to contain them.

A number of experiments were made with the view of ascertaining whether other substances besides sewage were capable of producing organisms such as had been observed in the cases referred to, when added to solution of sugar; but, although in a few instances growths were produced, they never resembled the cells caused by sewage.

The author states that filtering the water through the finest Swedish paper does not remove the germs, and boiling for half an hour does not destroy their vitality. Filtration through a good bed of animal charcoal was found to be the most effectual mode of removing them, and even in this case the charcoal must be freely exposed to the air from time to time, or it soon loses its purifying power.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Acidum Arseniosum. *Arsenious Acid.*—White arsenic of commerce is procured by heating certain ores in a current of air. These ores are compounds of arsenicum and sulphur, with the metal copper or iron, or sometimes nickel and cobalt. Atmospheric oxygen, combining with the sulphur, gives rise to sulphurous acid gas, SO_2; with the metal it forms an oxide; with the arsenic, As_2O_3. This last collects in the flues of the furnaces, whence it is removed and purified by resublimation.

[§ Occurs as a heavy white powder, or in sublimed masses, which usually present a stratified appearance, caused by the existence of separate layers, differing from each other in degrees of opacity. When slowly sublimed in a glass-tube, it forms minute brilliant and transparent octahedral crystals.]

White arsenic belongs strictly to the class of bodies already described as anhydrides; it is not itself an acid, for it contains no hydrogen, but it is supposed to form the acid when boiled with water, in which it dissolves only sparingly. The formula of the acid, although it cannot be isolated, is inferred to be H_3AsO_3,

$$As_2O_3+3H_2O=2H_3AsO_3$$

from the composition of its salts; arsenite of silver being Ag'_3AsO_3. The potassium arsenite is probably formed in preparing Fowler's solution (liquor arsenicalis) by boiling white arsenic, water, and carbonate of potash together.

When white arsenic is mixed with charcoal, and heated in a flask or tube, it loses its oxygen, which combines with carbon, and escapes in the form of carbonic oxide, and a crystalline sublimate of the element arsenicum is formed in the cool part.

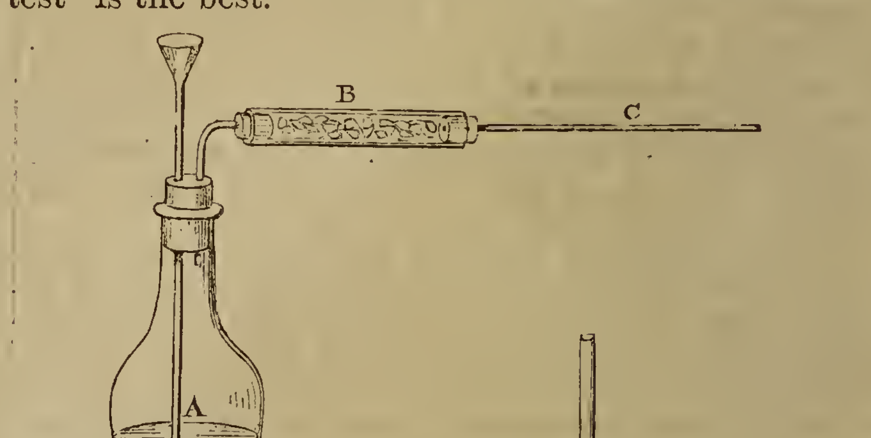
$$2As_2O_3+3C_2=As_4+6CO.$$

Arsenious anhydride and soluble arsenites may be recognised by the tests following:—

[§ Its solution gives with ammonio-nitrate of silver a canary-yellow precipitate (Ag'_3AsO_3), insoluble in water, but readily dissolved by ammonia, and by nitric acid. Sprinkled on a red-hot coal, it emits an alliaceous odour.]

Sulphuretted hydrogen passed into a solution of it acidified with HCl, gives a yellow precipitate, As_2S_3, which is readily soluble in sulphide of ammonium. Sulphide of cadmium, which is like it in colour, is not soluble in sulphide of ammonium.

To detect a compound of arsenic, whether pure or mixed with other matters, a modification of "Marsh's test" is the best.



A is a six-ounce flask fitted with funnel-tube, and containing pure granulated zinc and dilute sulphuric acid. The hydrogen produced in A is conducted through B, a short wide tube, containing chloride of calcium, to absorb moisture from the gas. C is a tube of hard glass, which will bear the heat of the

Bunsen gas flame without collapsing. The solution of arsenic introduced into A gives, by the action of the zinc and acid, arsenuretted hydrogen:—

$$As_2O_3 + xZn + xH_2SO_4.$$
$$= xZnSO_4 + 3H_2O + 2AsH_3 + (x-6)H_2.$$

[x=any indefinite number of atoms.)

The mixture of hydrogen and arsenuretted hydrogen escapes through C, which is heated to redness after the air has all been driven out. The elementary arsenic is then deposited as a brown or black shining stain on the glass, just beyond the lamp, whilst the hydrogen passes on and escapes.

For estimating the amount of pure white arsenic in any of its preparations, the Pharmacopœia indicates that 4 decigrams of it dissolved with about twice its weight of bicarbonate of soda, discharge the colour of 80·8 cubic centimetres of the volumetric solution of iodine.

White arsenic, when treated with iodine in the presence of water, gives rise to hydriodic acid and arsenic anhydride; both these are colourless, and therefore the brown colour of the iodine disappears.

$$As_2O_3 + 2OH_2 + 2I_2 = As_2O_5 + 4HI.$$

One molecule of white arsenic (198 grams), according to this equation, will reduce 4 atoms ($127 \times 4 = 508$ grams) of iodine. Now 508 grams iodine are contained in 40,000 cub. centims. of the solution (for in making it 12·7 grams are dissolved in 1000 of the liquid), so that 40,000 cc. would be the quantity decolorized by 1 gram-molecule of white arsenic. Such an amount would never be used in an experiment, but a simple calculation shows that the quantities indicated in the B. P. are in the same proportion to each other. For

Grams of As_2O_3.		Cc. of Vol. Sol. of I.		Gram As_2O_3.		Vol. Sol. I.
198	:	40,000	as	·4	:	80·8

The best antidote to white arsenic is freshly made ferric hydrate; it gives rise to an insoluble ferrous arseniate.

Arsenic Acid.—The substance generally known by this name is again the anhydride, not the true acid. It is prepared by boiling white arsenic with nitric acid, and evaporating to dryness; the residue is a white powder, the anhydride, As_2O_5. By dissolving this in water, and concentrating the solution, the acid, H_3AsO_4, is obtained in deliquescent crystals. Arsenic acid and its salts are distinguished from arsenites, and also from phosphates, by giving a red precipitate with nitrate of silver, Ag_3AsO_4.

Sodæ Arsenias. *Arseniate of Soda*, $Na_2HAsO_4, 7H_2O$.—Arsenious acid, nitrate of soda, and dry carbonate of soda, are thoroughly mixed, and then fused at a red heat in a crucible. When the effervescence (caused by the escape of N_2O_3 and CO_2) has ceased, the fused salt is poured out upon a stone. As soon as it has solidified, the mass is boiled in water and the liquid set by to crystallize. The ingredients react in the following manner:—

$$\overset{198}{As_2O_3} + \overset{85\times2=170}{2NaNO_3} + \overset{106}{Na_2CO_3}$$
$$= \underset{\text{Sodium pyro-arseniate.}}{Na_4As_2O_7} + N_2O_3 + CO_2.$$

It will be seen that the proportions of the ingredients ordered in the B.P. are nearly identical with those required theoretically, as shown in the equation; the carbonate of soda only being in trifling excess.

Parts of As_2O_3.		$NaNO_3$.	Na_2CO_3.
Theory . . .	198	170	106
Being nearly =	10	$8\frac{1}{2}$	$5\frac{1}{3}$
B.P.	10	$8\frac{1}{2}$	$5\frac{1}{2}$

Arseniate of soda crystallizes sometimes with 12 instead of 7 molecules of water; the tests of the B.P. must, therefore, be made use of to identify the official salt. At 300° F. it loses the whole of its water of crystallization, amounting to 40·38 per cent. 1 gram of the residue, that is, of anhydrous arseniate of sodium, mixed with 5·3 cubic centimetres of volumetric soda (which converts it into trisodic arseniate, Na_3AsO_4), continues to give a precipitate of arseniate of silver with volumetric nitrate of silver, till 161·3 cubic centimetres of the latter have been added.

Ferri Arsenias. *Arseniate of Iron.*—Made by mixing together solutions of arseniate and acetate of soda and sulphate of iron. The arseniate and sulphate of iron would alone give rise to the production of an acid arseniate of iron, which would not be precipitated, probably thus:—

$$4Na_2HAsO_4 + 4FeSO_4$$
$$= 4Na_2SO_4 + Fe_32AsO_4 + Fe''H_42AsO_4.$$

But the addition of the acetate of soda remedies this, and the whole of the iron is precipitated as arseniate.

$$2Na_2HAsO_4 + 3FeSO_4 + 2NaC_2H_3O_2$$
$$= 3Na_2SO_4 + Fe_32AsO_4 + 2HC_2H_3O_2.$$

[§ A small quantity boiled with excess of caustic soda and filtered, gives, when exactly neutralized by nitric acid, a brick-red precipitate on the addition of solution of nitrate of silver.] This distinguishes it from the phosphate, which it closely resembles in appearance.

Acidum Benzoicum. *Benzoic Acid.*—May be prepared,—

1. By mixing benzoin with sand, and heating cautiously; the benzoic acid rises and condenses in the cool cover of the pot in crystals.

2. By boiling benzoin with half its weight of slaked lime, which forms, with the acid present, benzoate of lime, filtering, concentrating, and adding hydrochloric acid. On cooling, the acid crystallizes.

3. By boiling hippurate of lime, obtained by adding lime to cows' and horses' urine, with hydrochloric acid.

$$\underset{\text{Hippuric acid, or benzo-glycocine.}}{HC_2(C_7H_5O)H_3NO_2} + \underset{\text{Water.}}{H_2O}$$
$$= \underset{\text{Glycocine.}}{C_2H_5NO_2} + \underset{\text{Benzoic acid.}}{HC_7H_5O_2}.$$

4. By oxidizing naphthaline with nitric acid,

$$\underset{\text{Naphthaline.}}{C_{10}H_8} + \underset{\text{Oxygen, from the nitric acid.}}{4O_2}$$
$$= \underset{\text{Phthalic acid.}}{H_2C_8H_4O_4} + \underset{\text{Oxalic acid.}}{H_2C_2O_4}.$$

and converting the phthalic acid into a salt of lime, and heating this pretty strongly with hydrate of lime. The phthalate of lime is converted into benzoate and carbonate.

$$\underset{\text{Phthalate of lime.}}{2CaC_8H_4O_4} + \underset{\text{Hydrate of lime.}}{Ca2HO}$$
$$= \underset{\text{Benzoate.}}{Ca2C_7H_5O_2} + \underset{\text{Carbonate.}}{CaCO_3}.$$

5. By exposing essential oil of almonds (benzoic aldehyde or hydride of benzoyl) to the air, it absorbs oxygen.

$$2C_7H_5OH + O_2 = 2C_7H_5OHO.$$
Hydride of benzoyl. Hydrate of benzoyl, or benzoic acid.

Benzoic acid is never manufactured in this way, but the reaction is interesting and important. Benzoic acid is crystalline, volatile, very soluble in spirit and in alkaline solutions, but only slightly soluble in water. Cinnamic acid resembles it closely in this respect, but differs from it in giving a calcium salt, which is much less soluble in water than the benzoate, and also by this test. [§ Boiled with solution of bichromate of potash and sulphuric acid, it evolves an odour of hydride of benzoyl.]

$$2HC_9H_7O_2 + 5O_2$$
Cinnamic acid.

$$= 2HC_7H_5O + 2H_2O + 4CO_2.$$
Benzoic hydride.

Benzoic acid does not, under the same reagents, evolve any odour.

Reviews.

Lecture Notes for Chemical Students. By Edward Frankland, F.R.S., Professor of Chemistry in the Royal School of Mines. Vol. I. Inorganic Chemistry.

We are very glad to welcome the reappearance of Dr. Frankland's 'Lecture Notes.' Whatever may be the views of individual teachers on the question of chemical notation, and whatever may be the objection to the particular system adopted in the present instance, a book which gives a really systematic form to the fragmentary and discursive snatches of commingled fact and theory hitherto found in most manuals, cannot but be acceptable to professors as well as to students. The chief object of the small volume before us, as explained in the preface, is to relieve the student from the task of making very copious notes in the lecture-theatre, and so allow him to concentrate his attention upon the arguments and explanations of the speaker. Now it not only well fulfils this purpose, —a sufficiently useful one, when it is considered how rare among students is the art of making good notes such as will be afterwards serviceable in private,—but it gives a framework, the outline and connecting links of which stand out quite boldly through the scanty drapery of description with which it is clothed. The description of the properties of the bodies treated of is almost entirely omitted, but on looking through the book it will be seen that all the reactions which serve to establish the relationship between the several members of any series of bodies, are brought into sufficient prominence, and every pains seems to have been taken to supply all the information required to back up the system of classification advocated.

The arrangement of the matter is in accordance with the classification of the elements founded on their atomicity or quantivalence; but this classification is presented in a judiciously modified form. The elements are arranged as monads, dyads, etc., according to the number of atoms of hydrogen which their atoms are capable respectively of representing; but the monads, for example, are subdivided into four subclasses or sections. The first contains hydrogen only. Even now that everybody quite believes in the thoroughly metallic character of hydrogen, it is still necessary, considering its physical peculiarities and small atomic weight, to set it apart from the solid metals potassium, sodium, and silver. The second section of monads includes fluorine, chlorine, bromine, and iodine; the third comprises cæsium, rubidium, potassium, sodium, and lithium; the fourth, thallium and silver: and so on through six groups up to the hexads. One of the strange results of this sort of arrangement, however, is that we have to look for lead, which is at least as closely related to thallium as any of the alkaline group, in the fourth column among the tetrads. Oxygen is, in like manner, dissociated from its kindred sulphur, aluminium from chromium and iron, copper from silver, zinc from cadmium. But of course, all these questions would be fully discussed in the lectures, of which these notes are but the skeleton. Such objections are moreover applicable to every scheme of classification which has hitherto been proposed.

We have to congratulate the learned author upon having laid aside in this his second edition, the greater part of the cumbrous and, to our mind, objectionable graphic formulæ, with which the pages of his first edition were so obtrusively overloaded.

So much has been urged both for and against the employment of this kind of notation in the pages of this Journal, as well as elsewhere, that it would be superfluous to reiterate those arguments. We would merely direct notice to the fact that either his opponents' remonstrances, or the late discussion in the chemical world on the (we had almost said the *late*) atomic theory, or possibly original considerations have certainly induced Dr. Frankland to think better of it, and expunge from his reprint the greater number of these intricate and ingeniously disposed patterns. A few, it is true, linger, but they are mere ghosts, which no one need be afraid of. And that no doubt may remain that Dr. Frankland has modified his teaching, if not his creed, we quote the first lines of his former volume, and set them side by side with the words he now writes.

"*Definition.*—Chemistry is the science which treats of the—

1866.	1870.
atomic composition of bodies, and of those changes in matter which result from an alteration in the relative position of atoms.	composition of all kinds of matter, and of those changes in composition which result from the action, either of different kinds of matter upon each other, or of external forces upon one and the same kind of matter."

We repeat, we congratulate him on this emendation, and, doing so, we feel satisfied that the book will prove as useful as we have every right to expect it to be, from its own intrinsic merits, and from the high standing of its distinguished author. W. A. T.

The Students' Flora of the British Islands. By J. D. Hooker, C.B., M.D., D.C.L., LL.D., F.R.S., L.S., etc., Director of the Royal Gardens, Kew. London: Macmillan and Co. 1870. Fcap. 8vo, pp. xx. 504.

This book is, as might be expected from such an accomplished botanist as Dr. Hooker, one which will undoubtedly prove a most useful manual to students and others interested in the British Flora, and we may safely predict for it a wide and lasting success. Its object, as stated in the preface, is "to supply students and field botanists with a fuller account of the plants of the British Flora than the manuals hitherto in use aim at giving." In it will be found, as the result of the author's well-known extensive acquaintance with plants of all parts of the world, a much broader and more philosophic idea of genera and species than we might have met with if the work had been written by one whose attention had been more exclusively restricted to the flora of so limited an area as our own.

In the arrangement of the book the 'London Catalogue' of 1867 has been followed, and the well-known works of Syme and Watson have been freely consulted, but its great value arises from the fact that all the ordinal, generic, and specific characters of the plants have been rewritten by the author, and great care has been taken to render these descriptions as simple and perfect as possible.

From pages i. to viii. we have an excellent preface, followed by (ix. to xx.) a "Synopsis of the Natural Orders," instead of the usual artificial key, Dr. Hooker remarking that from experience he finds such artificial keys produce superficial habits amongst students; whilst diagnoses are more conducive to habits of observation. This change too is of advantage to the student's future studies in Botany, as it familiarizes him with the method always employed in more scientific works. Next follow the descriptions of the plants themselves, the names of the orders, genera, and species being in Egyptian type, rendering them at once distinct from the other letter-press. As an illustration of the book, we will quote from it the description of the sweet Violet.

"2. **V. odorata**, *L.*; slightly hairy or downy, runners very long, leaves broadly cordate, spur nearly straight, style hooked, stigma oblique. *Sweet Violet.*

"Hedgebanks and copses, wild in E. and S. E. England, naturalized elsewhere, perhaps native of E. Ireland; fl. March–May.—*Rootstock* short, scarred. *Leaves* deeply cordate at the base, sinus closed; stipules glandular. *Bracts* at or about the middle of the peduncle. *Flowers* fragrant, blue, white, or red-purple; lateral petals with or without a tuft of hairs; spur short, obtuse. *Anther-spurs* linear-oblong. *Capsule* pubescent, pedicels decurved.—DISTRIB. Europe, N. Africa, N. and W. Asia, to the Himalaya."

In the Umbelliferæ, in addition to the diagnosis, there is an analytical key. In some of the critical genera, Dr. Hooker has followed some well-known authority. The genera *Rosa* and *Rubus* have had the benefit of Mr. Baker's care, whose well-known accurate knowledge of them is fully recognized by British and Continental botanists.

In conclusion, we cordially recommend the book to students as a companion in their country rambles in search of

"These stars of earth,—these golden flowers."

A pastime at once healthgiving, intellectual, and mentally elevating and soothing.

BOOKS RECEIVED.

ECZEMA; its Nature and Treatment, and incidentally the influence of Constitutional conditions on Skin Diseases, being the Lettsonian Lectures for the Session 1869–70. By TILBURY FOX, M.D., etc. London: Henry Renshaw, 356, Strand. 1870.

CHARACTERISTICS OF THE PRINCIPAL WINES WE DRINK. By A. DUPRÉ, Ph.D., F.C.S. Reprinted from the 'Popular Science Review.' London: Robert Hardwicke, 192, Piccadilly. 1870.

Obituary.

SIR JAMES CLARK, BART., M.D., F.R.S.

We regret to have to announce the death of this eminent physician, which occurred on Wednesday, the 29th of June, at Bagshot Park, Surrey. The deceased baronet, who was the son of a farmer, was born in Banffshire, in 1788. He was educated at King's College, Aberdeen, and completed his medical studies at Edinburgh University, where he took the degree of M.D. Having passed some years in the service of the navy, he, in 1820, settled as a physician in Rome. Six years afterwards he returned to England, and practised in London. He was appointed physician to the Duchess of Kent and Princess Victoria, as well as to the late King of the Belgians, and on the accession of her Majesty to the throne, she made him her first physician, and conferred upon him a baronetcy. Sir James took a lively interest in the proceedings of the Pharmaceutical Society, especially at the time of its establishment, and for many years afterwards. He died at the advanced age of eighty-two.

We have also to announce the death of Mr. Thomas Salman, Cornwall Road, Westbourne Park, a much respected member of our Society. He died at his residence on the 12th of June, deeply and deservedly regretted by a large circle of friends.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

THE "AGE OF PROGRESS," AND THE PROVINCIAL MEMBERS.

Dear Sir,—In the last issue of the Journal, in the article entitled "An Age of Progress," you laudably endeavour to enlighten the benighted provincial members of the Pharmaceutical Society, and so philanthropic is your aim, that you kindly become the interpreter of a word, the subtle meaning of which you presume to think they have hitherto been unable to comprehend; in short, you attempt, though I apprehend without the least necessity, to show what the Pharmaceutical Council is, and what it is not.

I grant you that the Council is not "A Young Man's Mutual Improvement Association," I also grant you that it "aims at working out and protecting the interests of the Pharmaceutical Society," "which are grave," that its "talk" is "serious talk," and "thoroughly effectual as regards result;" but from the grave and effectual character of its proceedings I maintain that the "serious talk" which culminates occasionally in speech-making, when a "storm passes over its otherwise tranquil waters," is eminently *useful* for publication, and would do much to enlighten the provincials, and consequently would forward "An Age of Progress."

Of such vital interest have the proceedings of the Society become, since the passing of the Pharmacy Act, not only to the members themselves but to the entire trade, that nothing but dissatisfaction and want of perfect confidence will prevail, until the Council's proceedings are fully and faithfully reported.

No doubt there will be some slight disadvantage in publicity, but the greater weight of advantage will counterbalance all inconvenience. The only safe and simple plan is that of publicity, and whether the present Council will or not, that object will be attained.

If it be wished to have a good and reliable Council, composed of trusted and tried men, what better plan can be devised to enable the "provincials" to judge of their character and capacity than that which publicity would afford? If it be wished not to have another avalanche of "provincials," publicity may avert this great disaster.

I am sure I regret, and all will regret, that any gentlemen who have faithfully served us on the Council should be passed by. Still I cannot see how such an unfortunate result can be prevented at a time of excitement, like that preceding the recent election, when the trade, perhaps solely for the want of that information which fully reported proceedings would give, was rudely disturbed and unsettled by the premature and unwise attempt to interfere with patent medicines, and with the storage of poisons.

I trust, however, notwithstanding the free provincial admixture in the new Council, that it will be as useful and as zealous as any of its predecessors.

I am, dear Sir, your obedient servant,

ROBERT HAMPTON.

Manchester, June 20, 1870.

Sir,—Entirely agreeing with your article on the "Age of Progress," I beg leave to offer a few remarks upon the cause which, in my opinion, has elected a Council not well chosen to carry on the important duties of the Society.

Being one of the founders I speak with some experience, and although I have never taken an active part in its affairs, I have been ever ready to uphold the Council and strengthen their hands, whenever I have considered them unjustly attacked, as may be seen by reference to Vol. IV., First Series, p. 97, in a letter signed "A Town Member," and also in Vol. X., First Series, p. 210.

I believe that the Boards, as constituted from year to year, have done good service to the whole body of chemists, and that they have fairly earned our best thanks for the manner in which they have advanced our interest, in the broadest sense of the word; and therefore it was with the deepest pain I found the Council engaged, in the past year, in propounding a system of conducting business, as touching poisons, so extremely offensive, that I do not wonder it brought down a storm of indignation at the last annual meeting, which had the deplorable effect of depriving us of the valuable experience and services of many old members of the Council. Surely no man can have a greater influence to bear upon him, in the handling of poisons, than his own material interest.

As I have read in the Journal, from month to month, recommendations and propositions for the keeping of poisons, with the view of legal compulsion, I have felt perfectly ashamed of my calling. My own system being, to my mind, infinitely superior to any proposition I have seen, still I could not presume to recommend it to others, as every chemist must be guided by the construction of his shop, and other considerations.

I have hitherto forborne to make any comment upon the subject, believing it would all come to nothing, which the case now plainly shows.

I shall, at any time, feel much pleasure in showing my method of keeping poisons to any chemist,—not as being any wonderful contrivance, but for the simplicity which common prudence dictates. Doubting not most other chemists have a place equally good, and many perhaps better, nevertheless I have faith in my own, and should repel any interference.

If the Council will keep within their legitimate province, they will soon re-establish confidence, and, at the next election, have a due balance of experienced London members, who certainly are in the best position to render good service to the trade at large.

I am, Sir, your obedient servant,
John Beaton.

Kilburn, June 20th, 1870.

Dear Sir,—Will you kindly allow me to point out an error in the editorial article of the 15th instant? You speak of the provinces as being "omniscient," now that is just what they *are not*, and the desire for a greater amount of knowledge was the mainspring of their action in the matter of the election; had they been allowed to *know* a little more, they might possibly have *done* a little less; and had the statement of attendance on Committees been published *before* the election instead of *after*, the gentleman who has attended forty-four times would have stood higher on the list than he did. Further, we find from that statement that four members of the Council, who live within "omnibus ride from Bloomsbury Square" have attended just ten times amongst them, so that proximity to the Council-room does not necessarily produce attendance there.

Neither are we to be blamed for the "absence of names long held in reverence," seeing that those names were not even on the list of candidates; had they been so, they would hardly have been rejected. Even in the provinces there is *some* respect for Morson, Squire, and Deane, who have worked so long and so well, and whose names are an honour to British pharmacy.

Let us hope that the late storm will have the effect of clearing the atmosphere, and of bringing the Council and the members into better accord than has been the case for some time past, and there will then be no cause to regret our action in the matter.

Yours truly,
W. Wilkinson.

Manchester, June 20, 1870.

The Sale of Homœopathic Medicines by Pharmacists.

Sir,—It was not my intention to make any further remarks upon the above subject; but if you have no objection to carry the discussion into your new series, I should feel obliged if you will permit me to reply to Mr. Giles's second letter. In the first place, let me assure him that so far as I am concerned his letters have caused no annoyance whatever, and I believe he wrote them from a desire to benefit the trade generally.

I think that the real cause of the traffic in homœopathic medicines is to be found *not* "in the hardships under which pharmacy is often conducted," but in the fact that the public demands them. If there are any who "feel it inexpressibly painful" and "a degradation to themselves and their calling" to sell such medicines, to them are Mr. Giles's remarks very well suited, even if their "poverty and not their will consents." but I believe there are very few, if any, who feel thus.

Mr. Giles says, he *did not* represent the sale of homœopathic medicines as a "breach of trade honesty." Surely he must have forgotten his former statements, or does he desire to recall them, but knows not how to do so? What does he mean when he says, "They (the world) may possibly deduce another inference from this over-eagerness to make money all round, *obviously in defiance of conscience and consistency;* they may not unreasonably conclude that the pharmaceutist who humbugs one customer with his consent, may humbug the rest for his own profit, and that he who knowingly sells innocent sugar-plums for deadly aconite, may not scruple to sell cheap powdered slate for costly scammony"?

After such statements, I am surprised he should *deny* that he represented the sale of the above medicines as a breach of trade honesty. Does he mean to assert that if a chemist is open to a suspicion of supplying slate for scammony, he is not also open to the imputation of a breach of trade honesty? I maintain that if a chemist is suspected of selling slate for scammony, he may very reasonably be suspected of supplying rad. rhei ang. for rad. rhei E. I. elect., and if that is not "a breach of trade honesty," I should like to know what is?

Mr. Giles disowns Morrison's pills, but acknowledges Parr's pills "et hoc genus omne," and says that my argument is founded on an assumption. Well, Sir, I am agreeable to his substitution, or if he will, Perry Davis's Pain-Killer, of which it may be said—

"It matters not a pin,
Whether rubbed out or taken in,
Its effect is just the same."

My argument will then be founded *not* on an assumption, but on *an admitted fact*. He further states that he has a considerable respect for patent medicines (mark, *considerable* respect). I never before heard a chemist make such a statement, and I am inclined to think that Mr. Giles stands alone in this respect. But I am still more astonished when he says, "They are, at all events, based upon rational principles of therapeutics, such as pharmacy acknowledges." The principles on which patent medicines, as a class, are based (so far as my knowledge goes), are that one medicine is a remedy, or more frequently a specific for various diseases and disorders, differing materially from each other, and that, too, entirely regardless of differences in constitution and sex. And I was not aware before, that pharmacy acknowledged such principles.

If, however, such be the case, why do chemists adorn their shops with such a varied number of therapeutic agents when a few would answer the same purpose? Such an array is useless if Mr. Giles's statement is true. If he is inclined to dispute what I have said, I ask him to read a few of the many handbills that he receives from his wholesale house, and I think he will find that I have simply stated facts. With regard to the solution of camphor, it is undoubtedly an allopathic remedy; but it is only fair to state that homœopathy has brought it into such general use.

Again, with regard to Mr. Giles's prediction of the duration of homœopathy, he says that, according to his observation, it is already extinct as a form of medical practice. Mr. Giles has, I think, put his astrological telescope to the blind eye. I beg to inform him that "as a form of medical practice" it is far from extinct, as the rapidly increasing number of homœopathic physicians clearly shows. He says, too, that if left alone he "sincerely believes the present generation will outlive it." I suppose he means if left alone by chemists. Well, Sir, if it is left alone, I sincerely wish Mr. Giles a long life and a happy one. I quite agree with Mr. Swenden, when he says, "One thing is certain, that if homœopathy be destined to advance, and it certainly is gaining ground, the united opposition of the whole of the pharmacists in the country could not check it, for the motive of our opposition would be too apparent."

Mr. Giles is pleased to term homœopathy "*arrant folly,*" *ergo*, those who believe in it are arrant fools! including, of course, homœopathic M.D.'s. Really, how very complimentary we are! Permit me to remind him that homœopathic M.D.'s have to go through the same curriculum as allopathic M.D.'s before they can practise homœopathy. Again, he says, "Homœopathic practitioners do not now trust to homœopathic doses, etc.; they do not themselves use those absurd globules," etc. Here again, I think, Mr. Giles's observation is somewhat limited. Only very recently I asked a medical gentleman if he thought that pilules and globules were rarely if ever prescribed? and he replied, that he thought they were used quite as much as formerly, and I know he uses them largely himself.

In conclusion, permit me to remark, that I am as desirous as Mr. Giles to see our business raised to the rank of a profession, but I think he is going the wrong way to work to bring about such a result; at any rate, trying to clean the wrong end of the stick first. There are many things of far greater importance that want reforming in pharmacy before the sale of homœopathic medicines. Let him go to our country towns, large and small, and examine the class of business there, including Bristol, and he will find that 70 if not 80 per cent., or more even, is mixed up with the business of a grocer, hosier, cheesemonger, oil and colour merchant, or perhaps even all combined, and not unfrequently a genteel liquor traffic to boot. Let Mr. Giles endeavour to rid the business of such branches of trade, and I feel assured he will have the hearty co-operation of his *confrères*.

I am desirous, too, to see the business of a homœopathic and allopathic chemist kept entirely distinct; and I feel assured that homœopaths do not wish pharmacists, for their sake, to do anything that is "inexpressibly painful," or that they "feel to be a degradation to themselves and their calling." If the two businesses are kept so distinct, I firmly believe that homœopathy will make far greater strides than hitherto; and I hope that pharmacists will be more loyal to those "rational principles of therapeutics, such as pharmacy acknowledges," and to "scientific investigation" that the day may not be postponed when homœopathy shall have a "clear field and no favour" from pharmacists.

Apologizing for thus trespassing upon your space a second time,

I remain, yours respectfully,
ALFRED MARSHALL.

Highbury, June 16, 1870.

Sir,—As one of the offenders against whom Mr. Giles has directed his heavy onslaught in this month's Journal, may I be allowed to make a few observations?

I am pleased to recognize, and bow down to the lofty standard claimed by him for the pharmaceutical chemist, but what *is* the cause of the hot displeasure manifested by him towards homœopathy *in particular*, when he confesses that for Parr's pills, and other preparations from the *quack laboratory*, he has "considerable respect"?

At all events, homœopathy is practised by men of education and professional status, whose prescriptions the chemist must either literally follow or reject. Are we, as a body, prepared to adopt the latter alternative? But what shall we say of the *professional* standing of the pet quacks of Mr. Giles, and what of their scientific (?) preparations?

May not any ignorant pretender send as many nostrums *into the market* as he please, and impose, to any extent, upon public credulity through his mendacious statements, that he is allowed to publish with impunity? There is no guarantee of medical knowledge demanded of *him*. The law is strict *only* in enforcing the affixing of a stamp of proper value to every package he sends out.

May I use Mr. Giles's own word, and ask, can "humbug" towards a nation go further? It is needless, I am sure, to place before Mr. Giles a long list of the names of those who, entirely ignorant of medical knowledge and therapeutic skill, do not hesitate to blazon forth by every roadside, and through the universal press, their miserable medicaments, their lying protestations, but "luring to destroy."

I believe that very many pharmaceutical chemists, as well as myself, sell homœopathic medicines for the same reason that *we* sell quack medicines,—because the public demand them. We have no more credence in the practice than Mr. Giles himself, but, in fact, look upon homœopathy, from our stand-point, as one of the follies of the day, which now and then influence the public mind, to be displaced after a short season by some other novelty.

I should be glad to see a clean sweep made of all such medical myths from every pharmacy, and I doubt not many share in the feeling. With how much pleasure, then, should we have received Mr. Giles's avowal, had it been to this effect, that he not only abominated homœopathy but quackery *also!*

As an advanced man amongst us, he could venture (for the love of science) to take the initiatory step, since his business status could bear the drawback his yearly returns might show, and the pioneer's glory would perhaps be deemed by him a sufficient reward.

I have but just had my attention called to Mr. Giles's letter in the *April* number of the Journal, and am amazed at his forgetfulness of all proper courtesy towards *us*, especially in that portion of it, in paragraph 3, beginning "They may possibly," and ending "I know." I fear Mr. Giles wrote not only *calamo currente*, and therefore with little reflection, but also *atramento felleo*, hence his fierce and unwarrantable deduction.

I hope Mr. Giles does not assume that he himself is the only pharmaceutist influenced by high-souled honour in his calling. If he possess it, let him *rejoice* that others share that (to the pharmaceutist) precious treasure. We want *all* the help we can have to elevate our calling to its true position, but that can only be done by unity and good feeling; such advocacy as that of Mr. Giles, in the passage referred to, will effect nothing but disaster.

Mr. Swenden, in his letter of the 9th of April, has well referred to the business division of the matter in dispute. I will not, therefore, take up more of your space by any further remarks of mine. I could not, however, pass over *a swoop* so *relentless* and *uncalled for* without entering a protest against it.

I beg to remain, Sir, yours obediently,
THOMAS WITHERINGTON,
Local Secretary.

Worcester, June 16, 1870.

WORK FOR LOCAL SECRETARIES.

Sir,—Most of the Local Secretaries, whom I have known, seem to hold the office in vain; they do nothing for the benefit of their brethren, and the office gets no respect. Many of them cannot point to any work done, except, perhaps, that they have got some unauthorized neighbour into hot water for calling himself a "chemist," or some registered man fined because his printer accidentally slipped "pharmaceutical" into his address. Now, I would propose to Local Secretaries work profitable and pleasant, to make efforts to get the members of the trade together, and thus to form scientific and trade associations of which it will be an honour to be secretary; and one of the first subjects calling for their attention would be the prices of drugs, and for dispensing. It is a notorious fact, that many well-to-do chemists and pharmaceutists charge absurdly low prices—prices which, a little consideration would show, cannot pay in a business making such small returns as ours does. Some of our brethren forget to charge for skill, and want reminding of it. If a person presents a prescription to me consisting of—

Magnes. Sulphat. ℥j
Aquæ ℥viij,

I consider I am entitled to 1*s.* 6*d.* for dispensing it, and should make that charge, though I know many of my neighbours would charge 9*d.* or 10*d.* for it, and experience tells me that my customers like the medicine better at 1*s.* 6*d.* than at 9*d.* Our Local Secretaries may do great service to the trade by promoting amicable discussion and settlement of prices. There are probably but few in the trade who approve of low prices, but they adopt them because they fancy, or some unreliable customer tells them, that Mr. So-and-So is selling at low prices, and then, not to be outdone, they adopt Mr. So-and-So's fancied low scale.

If he can afford it, let the Local Secretary invite *all* his brethren to supper, or if he cannot, let him suggest such a meeting at some suitable place, and try to secure a good attendance; nothing brings men together and sets them at their ease like a supper, afterward discuss trade subjects, and let the Secretary be prepared to bring the talk to practical issue by resolutions, put into the hands of suitable men. The first meeting, well managed, would be sure to result in many other such being held. It seems most natural that men in the same trade should be friendly with one another, and should band together for mutual benefit. Will the Local Secretaries try?

QUINTUS.

EXEMPTION FROM JURIES.

Sir,—One would imagine when the Pharmaceutical Chemists were legally exempt from serving upon juries, that we had got rid of a very great nuisance, and so we should if we could only get our names properly erased from the Jury Lists, and so prevent ourselves from being summoned; but there is the difficulty.

You will be surprised to hear that since I have been exempt I have been summoned four or five times, and this has been done after my having taken the usual means to prevent it, viz. getting my name cancelled from the list. This would appear an easy matter, but it is not so; for I find the county select the jury from one list and the borough from another, and unless you annually trouble yourself in the matter your name is put upon the list, and when once summoned you are in duty bound to attend to claim exemption. This, of course, is a morning wasted. I thought this year I would be very particular in the matter, and you can, therefore, imagine my surprise on receiving another summons about a month ago. This I found was owing to my private residence being in the parish of Penn, and my name, unknown to me, being put upon another list altogether. This is very unpleasant, and the object of my writing to you is to ascertain if chemists in the larger towns are put to similar annoyance, and if not, the means they adopt to effectually prevent it. There is certainly fault to be found with the officials, who ought, by this time, to be aware of our exemption. I believe my neighbours have been troubled in a similar manner.

Yours truly,
W. Y. Brevitt.

Wolverhampton, June 24th, 1870.

Order of Merit at Examinations.

Dear Sir,—There is one part of our present system of examinations that I do not think is altogether right; for this reason I beg a portion of your space in the Journal. The point I wish to bring before you is this, "the arrangement of successful candidates *in order of merit*." That, Sir, I think is not quite justly carried out. For instance, a candidate presents himself for the Minor, and fails in three out of six tables, therefore is plucked, as it is commonly termed. He gets a note to say he is eligible to again appear in three months, when he will be re-examined in those subjects in which he previously failed. He is, at the end of that time, well up in those subjects; and the marks of the subjects he passed in at the previous examination are added to those acquired at the second examination. When the Journal is published, and the list appears, we find him perhaps second, or third, with several behind him, who have passed at their first attempt.

To the various readers of the Journal these facts are not shown, as no difference is made between those who pass first or second time, and often it makes those who have two examinations appear superior to one who passes the first time. This takes away the credit of passing without failure.

If to be placed in order of merit, I think they should be again examined in all the subjects, to entitle them to be arranged in the list as is now the rule.

Indeed, as matters are now, many will not mind failing first time, in order to get to the top of the list the second time. This is not written *simply* on my *own* account, but for the benefit of those who may follow.

Trusting others better able than myself will take up the subject,

I am, Sir, respectfully yours,
A Successful Minor Candidate.

Pendleton, June 21, 1870.

[We understand that an alteration has already been made in the mode of classifying successful candidates which will meet the writer's views.—Ed. Pharm. Journ.]

The Valisneria Plant and the Breeding of Leeches.

Sir,—In the April number Mr. Colton asks for information respecting the propagation of the Valisneria in leech aquaria, but observing no reply I venture to offer the following remarks:—

A mixture of sand, small stones, and shells is all that is required as *ground* for the root.

The plant should be placed lightly in and allowed to rest, and should not be rejected though apparently dead, as fresh shoots sometimes spring up when the leaves appear decayed.

The Valisneria does not appear to enjoy direct light, nor does it thrive in a dull corner. A good reflected light seems best suited for it, and the nearer to the open door of the shop the better; this I think is important.

By following these simple rules my stock of plants has, in less than three years, increased forty-fold. I shall be happy to send Mr. Colton one or two healthy plants, etc., if he will tell me *how;* and while on the subject of aquaria, which, as I think, are neither uninteresting nor out of place in our shops, may I ask him whether the breeding leeches are of the ordinary size, or, as I am told, much larger, and how his young brood is getting on?

Yours respectfully,
B.

33, *Norfolk Terrace, W., June* 24, 1870.

P.S. I should say the above are but jottings of my own experience; I do not give them as scientific facts.—B.

Anonymous Correspondence.

Sir,—I think it very desirable, and I hope it will be a point insisted on by the Editors of the new series of the Journal, that correspondents subscribe their communications with their names and addresses. Many letters lose half their value from want of attention to this. How much more valuable would the letters of "One who has known the drug trade more than thirty years," and that of N. H. in the supplementary number of the 15th of June have been, if the names and addresses of the writers had been given! A real *bonâ-fide* name is something substantial; but there is something shadowy and unreal in initial letters and fictitious names.

One correspondent who asks a question, relating to cough lozenges, that may be called "silly," because it has been so often answered, and has appended initials corresponding to my own, might, but for this denial, be mistaken for me.

I am, Sir, yours faithfully,
F. M. Rimmington.

Carbolate of Iodine.—Dr. Evans, of Dublin, has sent us a communication on this subject, in which, referring to Dr. W. G. Smith's note in our last number, he says, there was no controversy as to the fact, that ammonia will decolorize tincture of iodine, but as to the question, whether the so-called "carbolate of iodine" was decolorized in that way, which had been proved in the negative. This controversy must now be considered closed.

Barnsley Chemists.—A correspondent from Barnsley, who signs himself "Pipes and Tobacco," has written to vindicate himself and fellow-chemists from the imputations implied in the letter of "Spes," in the May number of this Journal. He says, "I feel persuaded, in my own mind, that our brother-tradesman (whoever he may be) has written upon first thought; for who would not fain think, that had he ('Spes') coupled kindness of heart with his intelligence, he would never have presumed to interfere with another man's business. After reading Spes's complaint over several times, I have come to the conclusion that the true cause of it is, in the fact of a customer having stood before him with a prescription dispensed by another chemist at a lower rate than he himself named; and by duly acknowledging this to be the true cause of his letter, and not what is sold, but how it is sold, the chemists of Barnsley will, I have no doubt, unanimously adopt the motto, 'Spectemur agendo.'"

Amateur wishes for a process by which he can prepare condensed milk.

Pepper's Ghost.—Mr. Pollard, of Rhyde, refers "Inquirer," on the above subject, to Pepper's 'Cyclopædic Science Simplified' (Warne and Co.).

"*Nemo*" (St. Andrew's) would probly find the filtration of the water through animal charcoal effect what he requires.

"*Minor Y. Z.*"—*Chloral Hydrate* and *Alcoholate of Chloral*. See Vol. XI. (n. s.) pp. 150, 721, and 846.

"*An Inquirer.*"—*Chloric Ether* and *Spirit of Chloroform.* See Vol. I. (n. s.) pp. 304, 343; Vol. III. (n. s.) p. 533; and Vol. XI. (n. s.) p. 662.

"*Major Maude*" (Watton).—The apparatus for preparing nitrous oxide gas may be obtained of Messrs. Ash and Son, Broad Street, Golden Square. When the gas is used largely, it may be stored in a gasometer with advantage.

S. G.—Dissolve the tannic acid in the glycerine, the sulphate of zinc in the water, then mix the two solutions. The resulting lotion should be clear.

Mr. Wilkinson's communication on the Regulations for Storing Poisons will appear next week.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W.*

PHARMACEUTICAL PROSPECTS IN CANADA.

BY J. BAKER EDWARDS, PH.D., F.C.S.

From some previous reports* your readers will be prepared to understand the present position of Canadian Pharmacy,—at least in Lower Canada, now best known as the province of Quebec. During the last session of the Local Legislatures, Bills were introduced to regulate the practice of Pharmacy both in the province of Quebec and in that of Ontario.

Both of these Bills, though diverse in character, and each supposed to be best adapted to the several localities, failed to pass into law, chiefly in consequence of medical opposition.

The Bill brought forward in Ontario closely follows the British Acts, and is likewise trammelled with poison regulations; that of Quebec, on the other hand, simply incorporated a College of Pharmacy, with powers of registration, examination, and penal statutes against offenders.

In Ontario no legislation at present exists touching Pharmacy, so that the Bill had to run the gauntlet of the free-traders. It was quietly shelved in Committee.

In Quebec, on the other hand, Pharmacy has had some recognition from the times of early settlement, and licences were required in order to practise it, which were obtainable from the Governor-General on presentation of satisfactory documents. This power, founded so far back as the 28th Geo. III. c. 8, in the year 1787, is probably the oldest enactment restricting British Pharmacy on record. A provincial medical board, appointed by the Governor, conducted the examination of candidates and granted licences to persons selling, vending, or distributing by retail, medicines in Lower Canada.† In 1847, the physicians and surgeons of Lower Canada obtained an Act of Incorporation, and assumed the functions of the Provincial Board; but the clauses in their Bill regulating the druggists and apothecaries were expunged, on the understanding and assurance that the chemists would incorporate themselves as a pharmaceutical society and make proper regulations for their own body. This they neglected to do, and, in 1864, the College of Physicians and Surgeons amended their Act, and obtained a clause requiring that no person should carry on the business of an apothecary‡ or chemist and druggist without a licence from the Board, to be granted after passing such examination as the Board may deem satisfactory. In 1865, the Board, by a bye-law, added the condition, "That the candidate for Pharmacy must also furnish proof that he has attended at some university, college, or incorporated school of medicine or of pharmacy within her Majesty's dominions, lectures on the following branches, viz. Chemistry, two courses, six months each; Materia Medica and Pharmacy, two courses, six months each; Botany, one course, three months." At present, although this curriculum has not been very strictly insisted on in individual cases, it is a legal barrier to the examination of competent persons already in business or of young men arriving from abroad. In the debates on the College of Pharmacy Bill at Quebec, the representatives of the Medical Board urged with great effect that many of the promoters of the Bill were persons who had neglected the existing regulations, and that the public had no proof of their competence; this objection was really of the most technical character, because the promoters were well known as leading members of the trade, both wholesale and retail, and most of them had been many years in business. To meet it, however, several presented themselves to the College Board at the next meeting, and applied for licences, but were informed that they must comply with the bye-law requiring attendance on lectures before the College could proceed to their examination. The present powers are, therefore, unsatisfactory to all parties, and probably both the chemists and the College will apply for further legislation during the next session of Parliament. Every such discussion tends to show how unsatisfactory is the attempt of the medical profession to legislate for or to attempt to regulate Pharmacy. This, the most thoughtful of the profession have from time to time acknowledged; and the worthy editor of the 'Canada Medical Journal'* supports this view in the following graceful terms:—

"With regard to the apothecaries and druggists obtaining an Act of Incorporation, we most fully endorse the views held by the late talented editor of the 'British American Medical Journal,' viz. 'We have long thought that, considering their number, their respectability, and the specific objects of their pursuits, they should be specially endowed with powers peculiar to themselves;' with this addition, that twenty-three years have more than quadrupled their number, and that the druggists and apothecaries of this part of the Dominion are, as a class, reliable, trustworthy, and thoroughly conversant with the details of their profession." . . . "It is in every way desirable that they should be incorporated, nor can we see what just grounds can be urged against their having the management of their own affairs."

On the other hand, an unthinking majority of the profession desire simply to retain power, and effectually resist reform measures.

In this respect, the French element is especially felt to be a great barrier to educational progress, being eminently conservative.

The debate in Committee at Quebec on this Bill was the most exciting and impassioned that has been seen or heard there for years. Some of the doctors, members of the Assembly, simply ignored all that had been done in Great Britain and America during the past twenty years; refused to recognize the examination of the Pharmaceutical Society; and rested their arguments entirely upon their own antecedents and "vested interests;" and the question assumes the aspect of a battle of races, with a large French majority, or a pitched battle between Montreal and Quebec, with French Canadians as umpires.

The French pharmaciens have generally complied with the law, but the English sturdily resisted it. In Quebec nearly all the druggists are licensed by the College, whilst in Montreal only four or five have complied with the law. The College has no penal clauses to enforce its laws, so that its powers may be set at defiance with impunity; but, upon the other hand, the unlicensed chemist has no power to recover a just debt, because he has placed himself *ultra legem*.

* See 'Pharmaceutical Movements,' vol. ix. p. 9; Montreal C. A. vol. ix. p. 104; 'Pharmacy in Canada,' vol. xi. p. 354.
† 'Canada Medical Journal,' vol. vi. no. 11.
‡ This term is generally adopted in America to denote a pharmacist, not a medical practitioner.

* Dr. G. E. Fenwick, C. M. J. vol. vi. no. 11, p. 526.

On the subject of a suitable pharmaceutical curriculum the medical mind is also quite at variance with pharmaceutical experience.

It has been abundantly proved that mere attendance on lectures will not educate the pharmaceutical student; and although it is an unquestionable advantage to the student to have his knowledge systematized by such means, yet habits of exact and exhaustive reading, of individual judgment and interpretation, of successful manipulation, and of self-reliance, are formed, not in the lecture-room, but in the laboratory and the library.

And there can be little question in the minds of those who have received its advantages, that synthetical and analytical manipulations in the laboratory are the only sound, true, and essential bases of an advanced pharmaceutical education. Chemical lectures, with merely flashy experiments and no laboratory instruction, and materia medica lectures, without museums, form but a poor curriculum, whatever be the number of "courses" prescribed.

In 1858, the College introduced a very stringent measure, which was successfully resisted. It demanded as a curriculum—*

A sound elementary education.

Certificates of good moral character.

One course of lectures on Medical Jurisprudence;

Two courses on Materia Medica;

Two courses on Chemistry;

Each of six months, at a MEDICAL college.

It also contained penal clauses for—

"Vending a spurious or adulterated medicine." Penalty, £5 to £10.

"Practising pharmacy for gain without a diploma." Penalty, £5 to £20.

"Sale of poison without certificate and registration." Penalty, £2.

"Poisons to be kept in a private and safe place, and in yellow bottles, legibly labelled." Penalty, £5.

"Visitation of governors to inspect shops." Penalty for resistance, £5.

In 1860,† a Bill was introduced to compel druggists to keep open from 6 A.M. to 9 P.M. from April to November, and certain hours on Sundays; it was rather an "early opening" than an "early closing" movement. This was also successfully resisted.

It is obvious that, unless pharmacists will legislate for themselves, they will be legislated for; and if they will not educate themselves, they will be educated more or less. It is highly desirable that the regulations adopted by British, Canadian, and American pharmaceutical bodies shall be, as far as practicable, assimilated, and the standards of education be consistent, if not uniform; and the more I see of the means of education available in various countries, the more confidently do I endorse the opinion of our lamented Jacob Bell, that our pharmaceutical students should avoid medical schools, and that it is our duty, wherever possible, to provide and encourage schools of practical chemistry and pharmacy, which are the true basis of pharmaceutical education.

ON SMOKE,—THE THEORY OF ITS FORMATION.

BY SHEURER-KESTNER.

It is well known that pure carbon, when burned even with an insufficient supply of air, never produces smoke. Thus wood-charcoal and coke produce none, while hydrocarbons, on the contrary, emit smoke when burnt with insufficient quantity of air, and some of them even cannot be ignited without yielding a smoky flame.

It is stated, in some works on chemistry, that the production of smoke, and therefore of soot, takes place in the following way:—A hydrocarbon being ignited, and taking fire, the hydrogen, being the more combustible body, is first oxidized, and there does not then remain enough oxygen for the combustion of the carbon, so that this is precipitated in the form of soot, and thus forms smoke. It is hardly necessary to insist on the unsatisfactory nature of this explanation, which I must say, however, is never advanced excepting as an hypothesis.

In fact, when a hydrocarbon is ignited, or, in other terms, when the first ignition is communicated to the molecules which should cause the oxidation of the whole substance, we cannot consider the hydrocarbon as a simple mixture of hydrogen and carbon; and still more, in saying that hydrogen is more combustible than carbon, we adopt a second hypothesis, for the hydrocarbon contains the vapour of carbon, and we know nothing of the more or less combustible nature of the vapour of carbon; it is, therefore, but one hypothesis used to solve another. We find a deposit, a separation of carbon, and we simply know this fact.

The investigations of M. H. Sainte-Claire Deville on dissociation, and those of Berthelot on the action of heat on hydrocarbons, induced me to endeavour, through some new experiments, to throw light on this hitherto obscure question.

M. H. Sainte-Claire Deville has shown that when a compound gas is brought to a sufficiently high temperature, the elements of which it is composed separate; that if the mixture resulting from this dissociation be quickly cooled, there will be found in the product a simple mixture in the place of the original compound; but if, on the contrary, the cooling has taken place slowly, the elements will be found to have recombined so as to form the original compound. Such was the first of the observations on which I rested my investigation.

On the other hand, M. Berthelot has shown that, on submitting certain compound bodies, and especially the hydrocarbons, to the action of a high temperature, it is possible to produce new compounds resulting from the elements of the first, and that this decomposition may be accompanied by a deposition of charcoal.

These two classes of facts being once admitted, the theoretical question of the formation of soot is almost solved. In fact, what occurs in a fireplace charged with coals? Let us suppose that the grate is covered with incandescent coal, that it only contains ignited coke: it emits no smoke. Let us now put fresh coals on the fire, and we soon find black smoke covering the mass and passing into the chimney. After a time the smoke diminishes, and finally ceases until the fuel has been renewed.

Here is what passes in this case. When the coal, composed of hydrocarbons, comes in contact with the incandescent fuel, the hydrocarbons soon become heated to a sufficient extent to cause their distillation. The vapours, coming in contact with the air, become immediately ignited, and consume the oxygen by which they are surrounded. If fresh quantities of air do not replace the oxygen already consumed,

* Pharm. Journ. Vol. XVIII. o.s. p. 44.
† Pharm. Journ. Vol. XI. N.S. p. 245.

the gas will pass up the chimney in the state in which it left the fire, that is, imperfectly burned; and thus we have hydrocarbons in the gaseous products of the combustion of coal. This is the first hypothesis I have to present.

The second hypothesis rests on the observation of M. H. Sainte-Claire Deville. At the moment when the hydrocarbons are disengaged, being brought to a very high temperature, they behave like a mixture of carbon vapour and hydrogen. If a sufficient quantity of air were supplied to this gas, its combustion would be complete; otherwise it would be imperfect, and we should have the result of a cooling more or less rapid. If the cooling should take place quickly, as would happen when it comes in contact with surrounding cold objects or cold air, a separation of carbon in the form of soot would occur, and free hydrogen would be left, which thus accounts for the presence of this element, as well as hydrocarbons, in the gaseous products of combustion, some of the hydrocarbons resulting from recombination of the elements, as explained by Deville.

Again, the third hypothesis rests on the observation of M. Berthelot. The hydrocarbons distilled from the coals are submitted to the heat of the fire, and decomposed. They form new compounds with deposition of charcoal, or, in other words, with the production of smoke. If there should arrive a sufficient quantity of air, the combustion of the whole will take place, but if there is a deficiency of air, the smoke will remain, together with the new hydrocarbon.

It is thus that smoke is produced. We have seen that there is always a deficiency of air as a necessary cause. This statement may appear extraordinary, as it has been found that the gaseous products of the combustion of coal always contain an excess of air. This, however, is not inconsistent with the previous statement, for in saying that there is a deficiency of air, what is meant is that this is the case in each volume or stratum of air in which combustion has taken place, but the gases which pass into the chimney may be regarded as a collection of such volumes mixed with others rich in oxygen, and these would be too much cooled to admit of their entering into combination.

It results from these theoretical considerations, that for the purpose of avoiding or diminishing smoke, it suffices to cause the intimate admixture of the gases the moment they quit the fire. In fact, this method has been practically applied with success. The first application of these principles was made by M. Harteg.*

The furnace of M. Harteg consists of two fireplaces, side by side, running parallel, and separated by a wall. The fires in these two fireplaces are fed alternately, and the currents of gas being directed one against the other at the back of the furnace, the strata are thus broken up and mixed so as greatly to diminish the amount of smoke.

M. Brix† diminishes greatly the amount of smoke or prevents it altogether, by introducing a little air in a minutely divided state behind the bridge of the furnace. This air supplies the required oxygen at the moment when the combustible gases are still sufficiently heated for them to become ignited, and the admixture is readily effected, but with some loss of combustible matter.

* Harteg, 'Sur la Combustion des Houilles de Saxe.'
† Brix, 'Sur la Combustion de la Houille de Prusse.'

Lastly, M. Thierry's process consists in introducing a jet of steam over the surface of the fire. The steam does not exert any chemical action, but operates mechanically by mixing the gases, and thus diminishes the amount of smoke.

The following experiment I have repeated frequently, and always with the same results:—If a metallic tube be introduced into the current of gases in the furnace by passing it through a hole in the brickwork, the following observations may be made,—when the tube is kept cold by an external current of cold water, a large quantity of soot will be deposited upon it, which will increase until the action of the cold water ceases. If the current of water be stopped, and the tube allowed to become hot, the soot will gradually disappear, and will not be again deposited under these circumstances but its formation may be at once determined by renewing the cooling process. After the explanation I have given of the production of smoke, the foregoing result is easily explained. The dissociated gases coming into contact with a cold surface, deposit the carbon, but at a sufficiently elevated temperature this combines with oxygen and passes off as carbonic acid.—*Répertoire de Pharmacie.*

ON DE LOSSEN'S OXY-AMMONIA.

BY M. E. FREMY.

In a previous communication on nitrous acid I announced the production of a body possessing reducing power in a high degree, and which is formed when nitrous acid or nitrites are submitted to the action of hydrogen, sulphuretted hydrogen, sulphurous acid, the alkali metals, zinc, tin, etc.

I was unable immediately to determine the nature of this body, and ascertain whether its composition was NH_3O* as thought to be the case by Maumené, whose publication on the subject has been of great use to me, because by the method I then adopted I obtained it in quantities insufficient for the purpose.

I have recently discovered a method of easily producing this derivative of nitrous acid, and have accurately determined its characters and nature. I have found that it possesses very marked basic properties.

I prepare it in the following manner:—I treat tin with concentrated hydrochloric acid, inducing chemical action by a slight elevation of temperature; when hydrogen is abundantly produced, I add to the liquor either nitrous acid or a nitrite, or, more simply, nitric acid; I precipitate the protoxide of tin with ammonia; evaporate the liquor to dryness by means of a water-bath, or *in vacuo;* and lastly, treat the dry residue several times with absolute alcohol, which dissolves the hydrochlorate of the base.

The circumstances under which this basic substance has been produced, and the way in which it is prepared led me to think that it is nothing else than oxy-ammonia, the important discovery of which is due to M. Lossen. The formula for oxy-ammonia, NH_3O, which might otherwise be written, $N_2H_4O.H_2O$, shows, among other things, that oxy-ammonia might be considered to be a hydrate of nitrous acid (nitrous anhydride) in which two atoms of oxygen are replaced by an equivalent quantity of hydrogen. Its production by the reducing action of hydrogen on nitrous acid or a nitrite, is thus perfectly intelligible.

But for the further elucidation of the subject, thus assuming so simple an aspect, two points remained to be determined.

* The notation in this paper has been changed from that used by the author to the new notation now used in this country.

The basic substance which I produced with nitrous acid and the nitrites is characterized by a very decided reducing power; the neutral and acid salts of this base produce the same effect,—thus, they immediately decompose permanganate of potash and iodic acid. The reducing power which the salts possess, is, however, greatly augmented when the base is set free by means of an alkali, and a liquor is thus obtained which reduces salts of copper, mercury, silver, and gold.

On the other hand, there is no mention made by M. Lossen, or in the publications of other chemists who have studied oxy-ammonia, of the reducing action of that substance.

Is therefore the base which I have obtained different from that of M. Lossen?

Assisted by a young chemist, M. Maudet, I have repeated M. Lossen's experiments, and prepared oxy-ammonia by the method he has described, causing a mixture of hydrochloric acid and tin to act on the nitric ether of wood spirit; and I have thus obtained a base with all the characters of that I produced with nitrous acid, and which, like it, possesses great reducing power. —*Répertoire de Pharmacie.*

ON THE PREPARATION OF SUBACETATE OF LEAD BY THE COLD PROCESS.

BY M. NERNING.

When this preparation is made with heat, the acetate of lead is liable to dissolve excess of oxide of lead, and insoluble basic acetate is thus produced, forming a white flocculent precipitate, which renders the liquid turbid. To obviate this inconvenience, M. Nerning proposes to operate as follows:—Put the water, litharge, and acetate of lead into a bottle, and let them stand, with frequent agitation, for twenty-four hours, then filter. The solution thus obtained answers all the purposes for which it is required in pharmacy, and, if kept in a well-stoppered bottle, it will remain clear even when kept for a long time.—*Journal de Pharmacie et de Chimie.**

MODE OF PREPARING THE CUTCH OF COMMERCE FROM THE ACACIA CATECHU.

BY CLAUDE DUMAINE.

Of this tree there are two varieties,—a white and a red kind; but the cutch or catechu is almost always prepared from the red kind, the white being seldom cut down. Cutch, or catechu, is prepared thus:—The tree is cut down to about 6 to 12 inches from the ground, and chopped into small pieces, the smaller branches and bark being rejected. The chopped wood is then taken to the place of manufacture, generally under trees in the open air, and placed over a brisk fire in mud jars, called *gharrahs*, filled with about two-thirds of water. This is allowed to boil down till, with the extracted matter, it forms a liquid of syrupy consistence. The contents of several jars are then poured into a larger jar and again placed over a brisk fire for a period of from two to four hours, and, when sufficiently boiled down, it is poured out over mats covered with ashes of cow dung and allowed to dry. The wood, when dry, is used for fuel.—*Journ. of Agr. and Hortic. Soc. of India, part iv. p.* 399. 1869.

* The editor, in a note, states with reference to this process, that it has long been adopted in the military hospitals, the following being the proportions of ingredients used:—Crystallized acetate of lead three hundred parts; litharge, in fine powder, a hundred parts; distilled water, six hundred and fifty parts. Put them into a bottle, shake them from time to time, and at the expiration of six or eight hours, filter.

THE PRESENT PROSPECTS OF THE SEWAGE QUESTION IN RELATION TO THE PUBLIC HEALTH.

BY HENRY LETHEBY, ESQ., M.B.

(*Read before the Metropolitan Association of Medical Officers of Health, May* 21, 1870.)

Hasty and inconsiderate legislation, promoted by those who, as the sequel will show, had no real knowledge of either the principles or practice of the subject with which they officiously meddled, together with the most mischievous charlatanism, has brought the whole question of the disposal of sewage into such a frightful mess, that the public are not only loud in their complaints of the injury inflicted on them, but are equally emphatic in their demands for a remedy.

A review of the parliamentary history of this subject would be instructive, and it would also be amusing, but for its serious results and its solemn prolixity; for it would show how Blue-book upon Blue-book, and report upon report, from the same officious hands, and in the same wearisome tone and bewilderment of facts and figures, had so perplexed the Legislature, that they were glad to dispose of the subject by hasty legislation, or by handing it over to some Royal Commission, not always discreetly chosen.

But bad as are the consequences of this, the prospects of the future are worse, for there is a well-grounded fear that the same incompetent school of sanitarians who have been concerned with our present difficulties, will also be concerned with the future, and that Parliament will again have to correct the errors of inconsiderate legislation. If this can be prevented it will be of vast importance to the public, and none are better able to assist in the matter than the health officers of this metropolis. It is with this object I draw your attention to it, and ask you to give it your serious consideration.

In the first place, let us inquire what is the nature of the thing we have to deal with. Sewage is at all times a very complex material, for it is composed not only of the solid and liquid excreta of the population, but also of the fluid refuse of every branch of industry, as the filth of kitchens, laundries, and dye-houses; the drainings from stables, slaughter-houses, and the public markets; the various liquid impurities of trades and manufactures; and the washings of streets and alleys. These, with the ejecta of the inhabitants, and a large volume of water, compose the sewage of towns. But each of these constituents has its specific influence on the composition of the general mass, and on the putrefaction to which it is subject. Every town or city, therefore,—in fact, every part of a city,—has its own peculiar quality of sewage, varying with the density of the population, the habits of the people, as to their diet, cleanliness, and trade pursuits; with the season of the year, the state of the weather, the day of the week, and even the hour of the day. This makes it difficult to obtain precise information of the nature and composition of sewage. Nevertheless, there are two ways by which the subject may be approached,—as by ascertaining the average amounts of solid and liquid matters contributed by each individual, and by the various branches of industry; and secondly, by making careful analysis of the sewage collected throughout the day at various seasons of the year.

Messrs. Lawes and Way in this country, and MM. Wolf and Lehmann on the Continent, have determined, with very nearly the same results, the average proportion of solid and liquid matters discharged daily from the human body. It varies, of course, with age and sex, but broadly it may be said that, taking a thousand individuals at all ages, as they are found in a population, they contribute about 2640 lbs. of liquid and moist excreta. In the dry state it would amount to about 141 lbs. This is at the daily rate of 42·25 oz. of moist, or 2·25 oz. of dry matter per head of the population. The washings of streets have been carefully examined by Professor Way, who finds that the liquid discharged into the gullies, after a heavy shower of rain, contains, in the case of granite roads, about 813·3 grs. of solid matter per gallon, and of this 276·2 grs. are dissolved, and 537·1 grs. suspended. In that of wood pavements it contains only about 39 grs. per gallon, of which 34 grs. are dissolved and 5 grs. suspended. The general average of the washings of several streets differently paved, and with various amounts of traffic, gave 262·6 grs. of solid matter per gallon, of which 113·3 grs. were dissolved, and 149·3 grs. suspended. The refuse of factories, etc., cannot be easily determined, and therefore we are obliged to rely for our results on the second method of investigation—namely, the analysis of the sewage at different times and places.

In this metropolis the sewage discharged by day contains about 94 grs. of solid matter per gallon, of which 38 grs. are suspended, and 56 grs. dissolved: of the suspended matters, 17 grs. are organic, and 21 grs. mineral; and of the dissolved, 15 grs. are organic, and 41 grs. mineral. The night sewage is not so rich in solid elements, for it contains only about 79 grs. of solid matter per gallon, of which 14 grs. are suspended and 64 grs. dissolved; and of these, 15 grs. are organic, and 64 mineral—the organic being distributed very evenly between the soluble and insoluble constituents.

Branch sewers, and those which are nearly stagnant, are generally very foul, for the sewage of them contains from 150 grs. to 500 grs. of solid matter per gallon, of which from 90 grs. to 250 grs. are suspended. The organic matter ranges from 20 grs. to 120 grs. in the soluble part, and from 20 grs. to 176 grs. in the insoluble.

Taking the average of all the results obtained in the examination of the metropolitan sewage by Dr. Hofmann, Mr. Witt, Professor Way, and myself, it may be said that it contains about 90·4 grs. of solid matter per gallon, of which about 29·8 grs. are suspended, and 60·6 grs. dissolved, there being about 15 grs. of organic matter in each of these constituents.

A storm of rain does not diminish the proportion of solid matter, for although it has a tendency to dilute the sewage, yet it washes away so large a quantity of filth from the streets, and disturbs so much of the sediment in the stagnant sewers, that the sewage after a storm generally contains more than the average proportion of solid impurity. Taking 90 grs. per gallon as the usual amount, it will be increased after a storm to 125 grs. per gallon, of which 64 grs. are suspended, and 61 grs. dissolved.

The physical properties of sewage are peculiar, for when examined under the microscope the clear liquor is found to contain a large quantity of amorphous organic matter, with filaments of various fungi, and it swarms with the lower forms of animal life, as beaded *spirulina*, *vibriones*, and *monads*; but soon after exposure to the air higher forms of infusoria appear, as *paramecium*, *vorticella*, *rotifera*, etc. The sedimentary matter consists of the remains of undigested food, as muscular fibre, husk and hair of wheat, the cells and starch of potato, and the tissues of vegetables, as cotton, cabbage, etc., and fibres of wool. It also contains the products of some of the secretions, as yellow biliary matter, intestinal mucus, and crystals of uric acid and triple phosphate; besides the *débris* of the streets, as particles of granite, flint, and carbonate of lime, with a large quantity of black amorphous matter.

(*To be continued.*)

THE "A B C" PROCESS FOR THE TREATMENT OF SEWAGE.

This process of purification, which has been adopted at Leicester and also on the south coast, at Hastings, and which is sometimes called "Sillar's process," was patented by Messrs. W. C. and R. G. Sillar, and W. G. Wigner. The process is described in the specification of the patent as follows:—

"We add to the sewage to be purified a mixture consisting of the following ingredients:—Alum, blood, clay, magnesia or one of its compounds, by preference the carbonate or the sulphate, manganate of potash, or other compound of manganese, burnt clay, otherwise known as ballast, chloride of sodium, animal charcoal, vegetable charcoal, and magnesian limestone. Of these substances, the manganese compound, the burnt clay, chloride of sodium, and magnesian limestone may be omitted, and it is not essential that both animal and vegetable charcoal should be used. If any of the ingredients named should from any cause be present in sufficient quantity in the sewage, it may, of course, be omitted from the mixture. The proportions in which the ingredients are to be used vary according to the nature of the sewage to be purified, as, for instance, if a large proportion of urine is present, we increase the proportion of clay; if the sewage is much diluted, we slightly increase the proportion of alum and blood; if it contains a large proportion of street refuse, we decrease the proportion of clay.

"For ordinary sewage the following proportions have answered well:—

Alum	600	parts.
Blood	1	"
Clay	1900	"
Magnesia	5	"
Manganate of potash . .	10	"
Burnt clay	25	"
Chloride of sodium . .	10	"
Animal charcoal . . .	15	"
Vegetable charcoal . . .	20	"
Magnesian limestone . .	2	"

"These substances are mixed together and added to the sewage to be purified until a further addition produces no further precipitate. The quantity required will be about four pounds of the mixture to one thousand gallons of sewage. In many cases it is preferable to mix the above compound with a small quantity of water, and add it in a liquid state to the sewage. The sewage must then be thoroughly mixed with the compound, and allowed to flow into settling tanks. The greater part of the organic and other impurities will be immediately separated in the form of large flakes, which rapidly fall to the bottom, leaving the supernatant water clear and inodorous, or nearly so. The water may then be allowed to flow away into a river, or be disposed of in any other way, and the sediment or mud allowed to accumulate at the bottom of the tank. In some cases it is preferable to add the compound of manganese to the water after the sediment produced by the other ingredients has been allowed to subside. The sediment will be found to possess the power of precipitating a further quantity of sewage; it must therefore be pumped or otherwise taken from the tank, and mixed with fresh sewage, the sediment being allowed to subside in the same way as before. The sediment may be used five or six times over in this way. When the sediment no longer possesses the power of precipitating the impurities in the sewage, it must be removed from the tank and allowed to dry; when partially dry a small quantity of acid, by preference sulphuric acid, may be mixed with it, which will retain all the ammonia in a soluble form. When dried, the sediment will be a valuable manure."

THE ECLECTIC INHALER.

This apparatus, which is made by Maw and Son for Messrs. Bullock and Reynolds, is described in the following terms by Dr. Morell Mackenzie, by whom it appears to have been designed.

A good inhaler should possess these properties:—

1st. It should be capable of containing a sufficient quantity of water, and also space for holding a sufficient quantity of steam.

2ndly. It should provide for the perfect medication of the vapour inhaled, by necessitating the passage of air through the liquid; or, in other words, it should allow the patient to inhale, NOT merely the medicated steam ascending from the hot liquid, but air which has passed through the liquid and become saturated with the volatile matter. This has been called the hookah or bubble-bubble principle, and has been *imperfectly* provided for in many inhalers.

3rdly. It should require very little effort on the part of the patient.

4thly. It should be capable of being kept at a uniform, or nearly uniform temperature.

5thly. It should be capable of being easily cleaned.

6thly. It should be capable of being used in either a sitting or recumbent position.

That the Eclectic Inhaler fulfils all these conditions will be now shown:—

a. It holds a pint of hot water, and has a larger air chamber above.

b. The perfect medication of the vapour is ensured by allowing air to pass through the medicated liquid on inspiration.

c. Absence of effort is secured by providing for the ample supply of air through the very numerous ingress holes (x and z), and for an easy passage of air through a large inhaling-tube and mouth-piece; and by being constructed in such a manner that the lower ingress-holes are only covered by about half an inch of the medicated liquids.

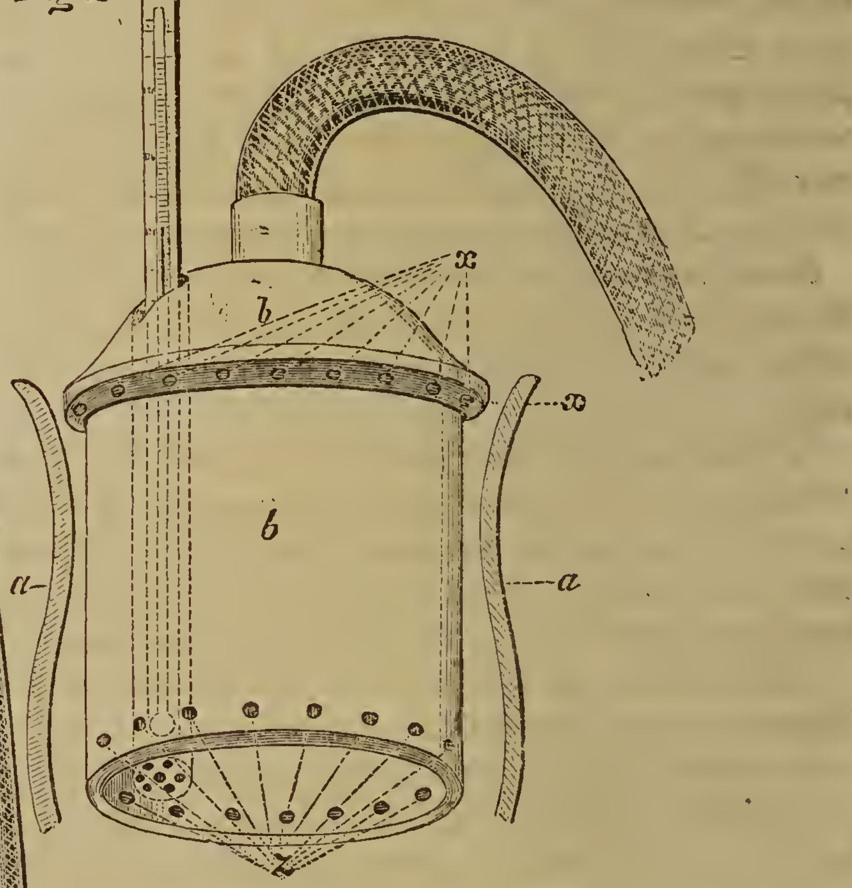
d. The temperature is maintained by a Clark's night-light, and regulated by a thermometer.

e. Cleanliness is provided for by the construction of the apparatus.

f. The use of the inhaler in any position is secured by the elastic inhaling tube, as in Curtis's.

Fig 1

Fig 2



DESCRIPTION.

The Inhaler consists of three parts—*a*, *b*, and *c*.

a is an open vase, and is essentially the containing vessel, into which the hot water and medicated solution are put. It is shown in Fig. 1, with a pint of water in it, and above the water-line is a large space for the steam.

b is a kind of lid, resembling an inverted tumbler. It is shown in Fig. 1, forming the lid of the containing vase, and in Fig. 2, with the sides of the vase drawn diagrammatically. The bottom of the tumbler forms the covering of the vase, and the sides of the tumbler dip down into it, leaving an air chamber between the two parts. When the vase has its proper quantity of water, the sides of the inverted tumbler or lid dip down only about half an inch below the water line. The circumference of the lid is perforated with small holes, as seen at x, and the circumference of what would be the rim of the tumbler is perforated in the same way at z. The apertures, both above and below, communicate with the air-chamber. When the patient inhales, air rushes through the various holes above at x, then through the air-chamber, again through the series of holes at z, and finally up to the mouth-piece, as shown by the course of the arrows. In the centre of the upper surface of the lid is a projecting nozzle, to which is attached a flexible tube, provided at its extremity with a double-valve earthenware mouth-piece. There is an opening in the lid, through which a thermometer registering high temperatures passes into the water.

c is a stand on which the vase rests, and is made hollow, so as to hold a night-light.

The Pharmaceutical Journal.

SATURDAY, JULY 9, 1870.

THE BETTS SUITS.

A condensed report of the proceedings before Vice-Chancellor James appears in page 32. Mr. Betts had filed twenty-five separate Bills in Chancery against retailers of capsuled articles; he sought injunctions, damages, and costs, and he has completely and signally failed.

Upon the testimony of Mr. Betts and his witnesses, and the arguments of counsel advanced in his interest, the Vice-Chancellor would have refused all that was asked, but when the defendant's case was entered upon, only so far as the reading of Mr. Betts's evidence under cross-examination, the Vice-Chancellor concluded to dismiss the Bills with costs, and remarked, "I must say this case seems to me about the most impudent case that ever came into Court."

Some passages in the cross-examination confirm the impressions which led to the formation of a Committee and to a subscription for defence; Mr. Betts says,

"I have no recollection of having had any conversation with Mr. Sandford in particular. I met a person of that name, amongst others, at the Pharmaceutical Society, when I do not believe the words twenty thousand pounds ever came out of my mouth."

"I told him, and I told them all together, as the Pharmaceutical synod, that with their vast numbers, their names being legion, a pound a-piece would put me straight in the matter; and if the numbers were few, five pounds a-piece would make an atonement for all that had passed."

"I think I said over thirty thousand pounds, but I did not in words say that I was resolved on being reimbursed; I said there must be something solid—something to eat."

The sentences quoted suggest whether, if all the twenty-five defendants had surrendered, the experiment of filing bills would not have been extended, and whether if £36,000, £30,000, or even £20,000 had as "something solid—something to eat," been provided by the Pharmaceutical Chemists of 1865, the cravings of Mr. Betts might not have expanded, and his operation extended far beyond the limits of the Pharmaceutical Society.

But who amongst the defendants, or the public, could have imagined that but one capsule, and that on a labelled bottle, would have been produced against each defendant, or that when Mr. Betts made affidavit that the capsules were not made by him, but were of foreign manufacture, there would be wrung from him, under cross-examination, evidence showing that they were made by his own Paris house; so that under his original oath there lurked the subtlety about Betts a Frenchman, and the same Betts as an English patentee, which led the Vice-Chancellor to say that he was shocked at such a mode of making an affidavit, and hoped never to see it again!

The extreme views contended for by Mr. Betts would, if successful, have added materially to the difficulties attending retail business; the Vice-Chancellor's remarks deal lucidly with the question, and will repay careful study; we see in them rules of conduct for the future, and thus good resulting from the litigation. Certainly the Defence Committee have been eminently successful, and deserve the best thanks of all interested in trade.

THE SCIENCE DEGREES OF THE UNIVERSITY OF LONDON.

The degrees of the University of London not only have acquired a high reputation on account of the stringency of the examinations through which they are obtained, so that they are looked upon as among the best tests of proficiency in the several departments of learning to which they relate, but they present to scientific men the peculiar advantage of including degrees relating mainly to scientific knowledge. The science degrees have become objects of ambition with scientific men, including chemists, geologists, and others, and we are very glad to observe that some of our members, associates, and students are becoming graduates in the University, and taking degrees in science. At the last examination, the result of which has just been published, we find that one of our associates, Mr. John Watts, obtained the highest degree in science, Doctor of Science, D.Sc., in the fourth branch, in which the subjects of examination were inorganic and organic chemistry, or mineralogy. Mr. Watts was a student in the Laboratory of this Institution about seven years ago; he was elected Junior Bell Scholar in 1863, and Senior Scholar in 1864. He has also passed the Major Examination of the Society.

THE POLLUTION OF RIVERS COMMISSIONS.

We alluded in our last number to the operations of a Committee appointed by the British Association, "to report on the treatment and utilization of sewage." The subject which this committee has undertaken to investigate has, in connection with other questions, occupied the attention of two commissions appointed by the Government, from whom three reports have already emanated; and one of those commissions being still in existence, further reports may be expected. The first Pollution of Rivers Commission was appointed by the Government in 1865, and consisted of Robert Rawlinson, John Thornhill Harrison, and John Thomas Way. That commission investigated the pollution of the Thames and the Lea, on which two reports were made. In 1868 the previously-formed commission was superseded by another consisting of Sir William Thomas Denison, Edward Frankland, and John Chalmers Morton, who have recently reported the results of their investigations on the Mersey and Ribble. These reports contain a large amount of valuable information relating to the past and present states of the rivers alluded to, the causes of the deterioration which has occurred in the waters of these rivers, the means which have been tried or suggested for mitigating the evils resulting from river pollution, and other subjects to which the attention of the Commissioners was directed by the terms of their appointment.

Many of the questions involved in this inquiry are of a purely chemical nature, and chemists are not agreed with regard to the solution of some of them. There are especially two views entertained of the influence of sewage on river-water. Some chemists contend that the deleterious matter communicated to rivers by the introduction of sewage, when the quantity is not very great, is soon destroyed by the natural process of oxidation, which is always occurring in running water, while others deny that this process of self-purification can be depended upon for rendering the water fit for domestic use. The Commissioners, with Dr. Frankland as their chemical guide, belong to the latter class; and Dr. Letheby, a good authority on such matters, may be taken to represent the former. We insert elsewhere the first part of a paper recently read by Dr. Letheby at a meeting of the Association of Metropolitan Officers of Health, in which his views are fully set forth.

UTILIZATION OF SEWAGE.

We understand that the authorities of Southampton, profiting by the example set them at Hastings, have determined to adopt the A B C process of utilizing the sewage of their town, and thus to preserve the local waters and beach from pollution. Any doubt that may exist as to the sufficiency of this process, a description of which was given in our last number, for purifying sewage-water so as to render it fit to be discharged into rivers, cannot apply to the waters discharged into the sea.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

July 1*st*, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden, Ince, and Southall. Dr. Greenhow was also present on behalf of the Privy Council.

MODIFIED EXAMINATION.

Thirty-eight candidates were examined; the following twenty-four passed, and were registered

As CHEMISTS AND DRUGGISTS.

Atkinson, Leonard	London.
Capell, Thomas	Steyning.
Chellew, William	London.
Dawney, Charles	Exeter.
Deane, Frederick Dawson	Jersey.
Garthwaite, William Humble	Liverpool.
Gillet, Daniel	Liverpool.
Hayward, George	Croydon.
Hume, William Andrew	Collingham.
Jenkins, David	Bridgend.
Morford, Thomas	Stoke Newington.
Moyle, Joseph	London.
Mundy, Alfred Octavius	London.
Organ, Edward	Bristol.
Pasco, George	London.
Rowell, John Childs	Reading.
Scott, Joseph	Worcester.
Smith, Charles William	Cirencester.
Smith, John Charles	London.
Squire, James	Lewes.
Stokes, Walter Edward	Sandgate.
Taylor, John	Oldham.
Taylor, Peter	London.
Wall, Alfred	Leamington.

FIRST, OR PRELIMINARY EXAMINATION.

One hundred and seventy-seven candidates were examined; the following one hundred and forty-five passed, and were registered as

APPRENTICES OR STUDENTS.

	Pank, Philip Durrell	North Walsham.
	Parsons, James	Sheerness.
	Peake, Arthur	Stalybridge.
	M'Jannet, James	North Walsham.
	Freeman, Ernest	Stourbridge.
	Lyddon, Richard	London.
Equal.	Cottam, William Procter	Lancaster.
	Parker, William	London.
Equal.	Goodacre, John William	Coventry.
	Kidd, Arthur	Broadstairs.
Equal.	Barry, Frederic	Bath.
	Marden, George	Fareham.
	Treweeks, Richard Harwood	Pembroke.
Equal.	Brookes, Frederick James	Selby.
	Daniel, John	Bromley, Kent.
	Mieklem, Austen	Reading.
	Hogg, Joseph Fawcett	North Shields.
	Fraser, Alexander	Liverpool.
	Lord, Frederick	Boston.
	Sherburn, Frederick	Keighley.
Equal.	Burder, Robert	Manchester.
	Gadd, William Fletcher	Oxford.
	Purse, Alfred Dodds	Sunderland.
	Dawson, Cantley	Stockport.
Equal.	Cooke, Edmund Herbert	Northampton.
	Pratt, Henry	Thirsk.
	Lewis, Edward	Sandown (I. W.).
Equal.	Burn, Henry	London.
	Butterworth, Albert	Sowerby.
	Farmer, William	Bilston.
	M'Cormick, Frank Henry	Cheltenham.
	Moore, Albert	Ashton-under-Lyne.
	Walton, William Henry	Croydon.
Equal.	Booth, William Grounds	Manchester.
	Tuck, Walter Barber	Eastbourne.
	Aitken, Henry, jun.	York.
Equal.	Slater, Jonathan	London.
	Taylor, Richard Eccles	Manchester.
Equal.	Robertson, George	London.
	Saunders, Thomas Bealby	Darlington.
	Sawyer, Henry	Carlisle.
	Turner, William Spencer	Hingham.
Equal.	Middleton, Christopher	Thirsk.
	Moss, Thomas Abbot	Carlisle.
	Pike, John	Great Yarmouth.
	Thompson, Frank Farrow	Cambridge.

	Plummer, Arthur	Reading.
Equal.	Dixon, Herbert	Retford.
	Johnstone, William, jun.	Nottingham.
	Holmes, Samuel	Hampstead.
Equal.	Fowler, George Bland	Bishop Stortford.
	Wilkins, Robert Elliott	Surbiton.
Equal.	Morse, Charles H. Stafford	Bishop Stortford.
	Nicholls, Arthur Lindley	Shanklin.
	Martin, William James	London.
Equal.	Buckle, James	Malton.
	Jackson, Richard	Carlisle.
	Leece, Frederick	Preston.
	Windle, John Thomas	Lower Norwood.
Equal.	Cuttle, Arthur Edward	Scarborough.
	Stables, William Skilbeck	Scarborough.
Equal.	Cox, George	Tewkesbury.
	Gardner, James Clarke	Newcastle-on-Tyne.
Equal.	Loadman, James	Liverpool.
	Morgan, Richard	London.
Equal.	Matterson, John Kitching	York.
	Shillcock, Arthur	London.
	Clifford, Richard Noon	Melton Mowbray.
Equal.	Savery, William Henry	Burslem.
	Scott, Thomas Alexander	London.
Equal.	Bolton, Felix Palmer	Dover.
	Eminson, Thomas	London.
	Richmond, William Wilkinson	Carlisle.
	Somerville, John	Carlisle.
	Spilsbury, James	Stafford.
Equal.	Farquhar, James	Aberdeen.
	Ord, Septimus William	Newcastle-on-Tyne.
	Rowcroft, Albert Edward	Gravesend.
	Turner, George Thomas	London.
	Sugden, Samuel	Newchurch.
Equal.	Emson, William Nicholls	Dorchester.
	Padwick, William Guy	London.
	Spence, Robert Davis	Harrogate.
Equal.	Matthews, Ernest	Royston.
	Sandwith, William Henry	Scarborough.
Equal.	Hemingway, Edward	London.
	Lynn, Edward	Blackheath.
Equal.	Twemlow, Francis Ernest Cassiani	London.
	Spencer, Alfred Barton	Burnham Westgate.
	Thompson, Harry	Norwich.
Equal.	Davies, Thomas Rhys	Swansea.
	Thompson, Thomas	Knaresborough.
	Worthington, William	Preston.
	Shackleford, Lewis John	Weston-super-Mare.
Equal.	Hall, Alfred Lee	Winchcombe.
	Wingate, John	Lincoln.
Equal.	Riach, Charles Beverly	Aberdeen.
	Wilson, Edward William	Nottingham.
	Bridger, Thomas	Fareham.
Equal.	Knowles, William Edward	Dewsbury.
	Mattocks, Charles Reynolds	Coventry.
Equal.	Brown, Walker	Retford.
	Carlton, Arthur	Horncastle.
	Tebb, Henry	St. Ives, Hunts.
	Smith, Walter James	Rochdale.
	Taylor, John	Carlisle.
Equal.	Goodlad, John Jonathan	Birmingham.
	Stevens, Nobbs	Swaffham.
	Glazier, Walter Henry	London.
Equal.	Chambers, Machin	Lincoln.
	Green, Frank	Cartmel.
	Shakerley, Benjamin	Liskeard.
Equal.	Pickup, John Arthur	Bacup.
	Saville, George	Wakefield.
Equal.	Lister, Joseph	Preston.
	Morgan, George Henry	London.
	Prust, Thomas William	Leeds.
Equal.	Cox, William	Lincoln.
	Steele, Stephen	Steyning.
	Wyborn, Samuel	Windsor.
Equal.	Cooke, William Kendle	Brighton.
	Sawden, Alfred	Filey.
	Willan, William	Preston.
	Evans, Ebenezer Richard	Cardigan.
Equal.	Banks, Edward	Salford.
	Gatenby, Robert	Beverley.
	Threlfall, Hugh	London.
Equal.	Adkin, Thos. Rennie Hutton	Pontypridd.
	Edwards, Thomas	Newport, Mon.
	Phillips, James Wilson	Broadstairs.
	Topham, Harry	Scarborough.
	Wellington, James	Oakham.
Equal.	Baker, Robert Southey	Battle.
	Barton, William	Preston.
	Bell, George, jun.	Hull.
	Churchman, James	London.
	Cordley, William Bains	London.
	Dodds, William	Hull.
	Hawley, William	London.
	Morson, Thomas Pierre	London.
	Platt, Jakeh Wright	Delph, Saddleworth.
	Salter, Thomas	Bradninch.
	Thompson, Mark Foggitt	Thirsk.
	Tucker, William Charles	London.
	Wardle, William	London.

The following is a list of the towns at which the Examinations were held, with the number of candidates examined at each town:—

Aberdeen	2	Liskeard	1
Bath	2	Liverpool	3
Beverley	3	London	43
Birmingham	1	Manchester	3
Boston	1	Merthyr	1
Bradford	1	Monmouth	1
Bridlington	1	Newcastle-on-Tyne	4
Brighton	2	Newport	2
Bristol	2	Norwich	8
Cambridge	3	Northampton	1
Cardigan	2	Nottingham	2
Carlisle	6	Pembroke	1
Cheltenham	2	Portsmouth	2
Chester	1	Preston	7
Congleton	1	Ramsgate	2
Croydon	1	Reading	2
Coventry	2	Retford	2
Darlington	1	Rochdale	3
Devonport	1	Ryde	2
Dewsbury	1	Scarborough	4
Doncaster	2	Selby	1
Dorchester	1	Stafford	1
Dover	2	Stalybridge	1
Fareham	2	Stockport	1
Hastings	1	Stoke-on-Trent	1
Hereford	1	Stourbridge	1
Horncastle	1	Sunderland	1
Huddersfield	1	Swansea	1
Huntingdon	1	Tewkesbury	1
Hull	2	Thirsk	3
Kendal	1	Wakefield	1
Kingston	1	Wednesbury	1
Leamington	1	Weston-super-Mare	1
Leeds	2	Windsor	1
Leicester	1	Wolverhampton	1
Lewes	1	Yarmouth	1
Lincoln	5	York	3

Total number of towns, 74.

The undermentioned, having presented to the Board a Certificate of Examination by the University of Oxford, was registered as an

APPRENTICE.

Ward, Edwin .... Cheltenham.

LOCAL SECRETARIES, 1870–71.*

Aberdare	Jones, John.
Aberdeen	Davidson, Charles.
Abingdon	Smith, William.
Altrincham	Holt, William Henry.
Andover	Madgwick, William B.
Ashby-de-la-Zouch	Johnson, Samuel E.
Ashton-under-Lyne	Bostock, William.
Aylesbury	Dickins, Rowland.
Banbury	Beesley, Thomas.
Barnet	Huggins, George Thomas.
Barnstaple	Goss, Samuel.
Basingstoke	Sapp, Arkas.
Bath	Pooley, John C.
Bedford	Cuthbert, John M.
Belper	Ashton, John.
Berwick	Carr, William Graham.
Bewdley	Newman, Robert.
Birkenhead	Jones, Charles.
Birmingham	Southall, William.
Blackburn	Pickup, Thomas Hartley.
Blackheath	Lavers, Thomas H.
Bodmin	Williams, Joel D.
Bolton	Dutton, George.
Boston	Marshall, Robert.
Bradford (Yorks.)	Rogerson, Michael.
Brecon	Bright, Philip.
Bridgnorth	Deighton, Thomas M.
Bridgewater	Payne, Reuben C.
Bridlington	Ford, Christopher.
Bridport	Beach, James.
Brighton	Gwatkin, James T.
Bristol	Stoddart, William W.
Bromley (Kent)	Baxter, William W.
Buckingham	Sirett, George.
Burnley	Thomas, Richard.
Bury St. Edmunds	Portway, John.
Cambridge	Deck, Arthur.
Canterbury	Harvey, Sidney.
Cardiff	Joy, Francis William.
Cardigan	Davies, David.
Carlisle	Moss, William.
Carmarthen	Davies, Richard M.
Carnarvon	Lloyd, William.
Chatham	French, Gabriel.
Chelmsford	Baker, Charles P.
Cheltenham	Smith, Nathaniel.
Chester	Bowles, Charles A.
Chichester	Long, William E.
Chippenham	Westlake, Bernard.
Christchurch	Sharp, Henry.
Cirencester	Skinner, Thomas.
Cockermouth	Bowerbank, Joseph.
Colchester	Manthorp, Samuel.
Congleton	Goode, Charles.
Coventry	Wyley, John.
Croydon	Crafton, Ralph Caldwell.
Darlington	Abbott, John Thomas.
Deptford	Lockyer, George.
Derby	Goodall, Henry.
Devizes	Clark, Robert.
Devonport	Radford, Isaiah Can.
Dewsbury	Gloyne, Thomas H.
Diss	Gostling, Thomas P.
Doncaster	Dunhill, William W.
Dorchester	Evans, Alfred.
Dorking	Clark, William W.
Dover	Bottle, Alexander.
Dudley	Hollier, Elliott.
Dumfries	Allan, William.
Dundee	Hardie, James.
Dunfermline	Brown, William.
Durham	Sarsfield, William.
Ealing	Barry, Thomas.
Edinburgh	Mackay, John.
Elgin	Robertson, William.
Evesham	Dingley, Richard L.
Exeter	Palk, John.
Eye	Bishop, Robert.
Falkirk	Murdoch, David.
Falmouth	Newman, Walter F.
Fareham	Peat, Walter.
Farnham	Crook, George.
Flint	Jones, Michael.
Forfar	Ranken, James A.
Gainsborough	Marshall, John F.
Glasgow	Kinninmont, Alexander.
Gloucester	
Goole	Hasselby, Thomas J.
Grantham	Gamble, Richard.
Gravesend	Beaumont, William H.
Greenock	Alexander, James.
Greenwich	Tugwell, William Henry.
Guernsey	Arnold, Adolphus.
Guildford	Martin, Edward W.
Haddington	Watt, James.
Halifax	Shaw, Benjamin.
Harleston	Muskett, James.
Harrogate	Coupland, Joseph.
Hartlepool	Corner, Robert.
Harwich	Bevan, Charles F.
Hastings and St. Leonard's	Bell, J. Alfred.
Haverfordwest	Saunders, David P.
Hereford	Jennings, Reginald.
Hertford	Lines, George.
Hitchin	Ransom, William.
Holywell	Jones, John.
Horncastle	Elsey, John.
Horsham	Williams, Philip.
Huddersfield	Higgins, Tom Sellers.
Hull	Earle, Francis.
Huntingdon	Ekins, William.
Ipswich	Wiggin, John.
Ironbridge	Hartshorn, William H. T.
Jersey	Ereaut, John, jun.
Kendal	Severs, Joseph.
Kidderminster	Bond, Charles.
Kilmarnock	Rankin, William.
King's Lynn	Atmore, George.
Kingston-on-Thames	Gould, Frederick.
Knaresborough	Sindall, John William.
Knutsford	Silvester, Joseph.
Lancaster	Wearing, William.
Launceston	Eyre, Thomas S.
Leamington	Jones, Samuel U.
Leeds	Reynolds, Richard.
Leicester	Cooper, Thomas.
Leighton Buzzard	Readman, William.
Leith	Finlayson, Thomas.
Leominster	Davis, D. Frederick.
Lewes	Martin, Thomas.
Lincoln	Peppercorn, Benjamin.
Liskeard	Eliott, Samuel.
Liverpool	Abraham, John.
Ludlow	Wells, Edwin.
Lyme Regis	Thornton, Edward.
Lymington	Allen, Adam U.
Macclesfield	Wright, George W.
Maidstone	Rogers, William.
Maldon	Wallworth, David.
Manchester, Salford, etc.	Wilkinson, William.
Market Harborough	Bragg, William B.
Mauritius	Baschet, George C.
Melbourne	Francis, Henry.
Merthyr Tydfil	Smyth, Walter.
Middlesborough	Taylor, William J.
Monmouth	White, Walter.

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

Montrose	Burrell, George.
Neath	Hibbert, William.
Newark	Harvey, John.
Newbury	Childs, Philip.
Newcastle-under-Lyme	Cartwright, William.
Newcastle-on-Tyne	Proctor, Barnard S.
Newport (Isle of Wight)	Orchard, Herbert J.
Newport (Mon.)	Phillips, John.
Newtown	Owen, Edward.
Northallerton	Warrior, William.
Northampton	Barry, James.
Norwich	Sutton, Francis.
Norwood	Birch, Henry Cooper.
Nottingham	Atherton, John H.
Odiham	Hornsby, John H.
Oldham	Hargraves, Henry L.
Oswestry	Smale, Richard B.
Oxford	Walsh, Edward.
Paisley	Hatrick, William.
Pembroke	John, David W.
Pembroke Dock	Andrews, Charles.
Perth	Reid, Neil.
Peterborough	Sturton, Richard.
Petersfield	Edgeler, William B.
Plymouth	Balkwill, Alfred P.
Poole	Penney, William.
Portsmouth, etc.	Rastrick, J. L. (*Southsea*).
Preston	Houghton, William.
Ramsgate	Morton, Henry.
Reading	Spokes, Peter.
Retford	Baker, William.
Richmond (Surrey)	Hopwood, Henry J. S.
Richmond (Yorks.)	Thompson, Thomas.
Ripon	Stevenson, Thomas.
Rochdale	Taylor, Edward.
Rochester and Strood	Harris, Henry W.
Rothesay	Duncan, William.
Rugby	Garratt, John C.
Ruthin	Bancroft, John J.
Ryde (Isle of Wight)	Wavell, John.
Rye	Plomley, James F.
St. Alban's	Davenport, Edward.
St. Andrew's	Smith, William.
St. Austell	Hern, William Henry.
St. Ives (Cornwall)	Young, Tonkin.
Salisbury	Atkins, Samuel R.
Scarborough	Whitfield, John.
Selby	Colton, Thomas.
Shaftesbury	Powell, John.
Sheerness	Rayner, William.
Sheffield	Radley, William V.
Shields, North	Brown, William H.
Shields, South	Mays, Robert J. J.
Shrewsbury	Cross, William Gowen.
Sleaford	Heald, Benjamin.
Southampton	Palk, Edward.
Southport	Cumine, Frederick H.
Spalding	Rhodes, Frank.
Stafford	Averill, John.
Stalybridge	Brierley, Richard.
Stamford	Patterson, George.
Stirling	Duncanson, William.
Stockport	Lowndes, Hervey.
Stockton-on-Tees	Brayshay, William B.
Stoke-on-Trent	Adams, Jonathan H.
Stourbridge	Bland, John Handel.
Stowmarket	Simpson, Thomas.
Stratford, Essex	Allen, William H.
Stroud	Blake, William F.
Sunderland	Nicholson, John J.
Swansea	Brend, Thomas.
Sydenham	Holloway, Thomas H.
Tamworth	Allkins, Thomas B.
Taunton	Prince, Henry.
Tavistock	Gill, William.
Tenby	Davies, Moses P.
Tenterden	Willsher, Stephen H.
Tewkesbury	Allis, Francis.
Thirsk	Thompson, John.
Tiverton	Havill, Paul.
Torquay	Millar, F. C. Moss.
Truro	Serpell, Samuel.
Tunbridge Wells	Gardener, Charles.
Ulverstone	Downward, John.
Wakefield	Gissing, Thomas W.
Wallingford	Payne, Sidney.
Walsall	Highway, Henry.
Wandsworth	Nind, George.
Wareham	Randall, Thomas.
Warrington	Webster, Samuel M.
Warwick	Baly, James.
Watford	Chater, Jonathan.
Wednesbury	Gittoes, Samuel James.
Welchpool	Williams, T. Kemble.
Westbury	Taylor, Stephen.
Weston-super-Mare	Rich, Thomas.
Weymouth	Cole, Walter T.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wigan	Barnish, Edwin H.
Winchester	Powell, Edward.
Windsor	Russell, Charles J. L.
Wolverhampton	Brevitt, William Y.
Woodstock	Stubbs, Robert.
Woolwich	Rastrick, John A.
Worcester	Witherington, Thomas.
Worthing	Cortis, Charles.
Wrexham	Francis, John.
Wycombe	Furmston, Samuel C.
Yarmouth, Great	Poll, William S.
York	Davison, Ralph.

Provincial Transactions.

THE SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The last General Monthly Meeting of the winter session was held at the rooms on Wednesday evening, June 15th; Mr. Wilson, President, in the chair.

Mr. Burnell was elected a member, and Messrs. Clifton, Hutchinson, Liversidge, and Pickering, associates.

The President and Ex-President having kindly represented the Association at the recent Annual Meeting of the Pharmaceutical Society, this was deemed a favourable opportunity to receive from them a *vivâ voce* report of the Meeting and Conversazione; their remarks were listened to with great interest, and a lengthened conversation ensued thereupon, after which a cordial vote of thanks to the deputation was moved by Mr. Radley, seconded by Mr. Ward, and carried unanimously.

It being announced that on the following evening Mr. Ward would deliver the last of a course of twelve gratuitous lectures on the Chemistry of the British Pharmacopœia, Mr. Maleham, on behalf of the Council, proposed a hearty vote of thanks to Mr. Ward, and characterized the lectures as very valuable and instructive, having been carefully prepared at a great expense of time; he trusted they would be duly appreciated by the Associates who had enjoyed the privilege of listening to them.

Mr. Hudson, in eulogistic terms, seconded the motion, which was supported by Mr. Radley, who, judging from the report of some of the pupils, felt convinced that Mr. Ward had rendered the Association and the youths good service; carried with applause.

Mr. Ward briefly replied, expressing some disappointment that a larger number of the Associates had not availed themselves of the opportunity to attend.

A newly invented label-damper was presented by Messrs. Bourne and Taylor, which was handed round for examination, and appeared to possess considerable merit; this concluded the business of the meeting.

Meetings of Scientific Societies.

ROYAL INSTITUTION.

A lecture was delivered on Friday evening, June 10th, by Dr. Odling, F.R.S., Fullerian Professor of Chemistry to the Institution, "On the Ammonia Compounds of Platinum." The lecturer alluded to the discovery of ammonia gas by Priestley in 1774; to the characteristic property of this gas, H_3N, of uniting directly with hydrochloric acid gas, HCl, to form a solid deposit of sal-ammoniac, or hydrochloride of ammonia, H_3N,HCl; to the similarity of behaviour in many respects of sal-ammoniac with chloride of potassium, leading to the inference that sal-ammoniac contains a composite metal ammonium, H_4N; to the resemblance between chloride of potassium and sal-ammoniac in the way in which they are acted upon by a weak galvanic current, when a drop of mercury forms the negative pole, an amalgam of potassium, K_xHg_y, in one case, and an amalgam of ammonium, $(H_3N,H)_xHg_y$, in the other case, being thus produced; to the characteristic property of ammonia gas of freely dissolving in water and forming a liquid having many of the properties of aqueous potash, although differing from that, inasmuch as hydrate of potassium is a definite body, while hydrate of ammonium has an inferential existence only. He then said that the most interesting circumstance with regard to ammonia, was its property of serving as a type from which compounds of the most varied character may be derived by substitution. The general character of those substitution-changes was described, and the views of Laurent and others, with reference to the constitution of some of the ammonia compounds, and especially those with platinum, were referred to.

He said that his attention having of late been directed to the study of these compounds, he has succeeded in differentiating the simplest of the platinum sal-ammoniacs from several allied and isomeric bodies with which it had before been confounded; and in obtaining from it the corresponding hydrated base of the series. He has also obtained some reactions of interest with bodies belonging to the more complex series; and, as a general result of his inquiries, has ventured to put forward a new scheme of regarding the entire group of bodies. This scheme is based on the recognition of two principal facts or propositions:—

1. The different platin-ammonia compounds are produced, in the first instance, from platinous chloride, $PtCl''_2$; and just as the platinum of this compound possesses the property of taking up two additional proportions of chlorine, so as to furnish the platinic compound Cl_2PtCl_2, or $Pt''''Cl_4$, so also does the platinum of the different ammoniated bodies obtained from platinous chloride possess the property of taking up two proportions of chlorine, or its equivalent of other negative radical, so as to furnish platinic compounds corresponding to the original platinous compounds respectively. Hence the division of platin-ammonia compounds into the two classes of platinous and platinic, the compounds of the former differing in constitution from those of the latter class, just as platinic differs from platinous chloride, by a direct fixation of chlorine.

2. The monad residue, or radical amidogen, H_2N, is capable of becoming the monad radical ammon-amidogen, $H_2N.H_3N$, or H_5N_2, just as the monad radical methyl, H_3C, is capable of becoming the monad radical methylen-methyl, or ethyl, $H_3C.H_2C$, or H_5C_2.* Viewing sal-ammoniac, $H_3N.HCl$, as the analogue of methylic chloride, H_2CHCl, the difference is noticeable that, while the ammonia both of sal-ammoniac and ammon-amidogen is easily separable, the methylen both of methylic chloride and methylen-methyl is inseparable from the remaining constituents of the respective compounds. Hence the distinction between the two classes of amic and ammon-amic platinum compounds, the latter differing from the former by an actual addition of diad ammonia, much as ethylic differ from methylic compounds by a virtual addition of diad methylen. The parallelism is indicated in the under-written formulæ for methylic chloride and ethylic chloride, sal-ammoniac and ammonio-chloride of silver, respectively—

$$H_2CHCl \qquad \left.\begin{matrix} H_2C \\ H_2C \end{matrix}\right\} \begin{matrix} H \\ Cl \end{matrix} \quad \Bigg| \quad H_2N.HCl \qquad \left.\begin{matrix} H_3N \\ H_3N \end{matrix}\right\} \begin{matrix} Ag \\ Cl \end{matrix}$$

The group of platin-ammonia compounds is thus divisible into the two classes of platinous and platinic, and each of these again into the two classes of amic and ammon-amic compounds. To these four classes must yet be added a fifth subclass of di-platinic compounds, including the nitrate-chloride of Raewsky, and the subsequently-discovered nitrate of Gerhardt and chloride of Hadow. The scheme of the constitution of the entire group, in accordance with the writer's views, is exhibited in the accompanying table of the principal chloride, hydrate, nitrate, and nitrite compounds.

Platinum Bases and Salts (proposed scheme).

Platosamine.

$Pt''(H_2N)_2.2HCl$
$Pt''(H_2N)_2.2H(HO)$
$Pt''(H_2N)_2.2H(NO_3)$

Amo-platosamine (Reiset's).

$Pt''(H_5N_2)_2.2HCl.Aq.$
$Pt''(H_5N_2)_2.2H(HO)$
$Pt''(H_5N_2)_2.2H(NO_3)$

Platinamine (Gerhardt's).

$Cl_2Pt''''(H_2N)_2.2HCl$
$Cl_2Pt''''(H_2N)_2.2H(HO)$?
$(HO)_2Pt''''(H_2N)_2.2H(HO)$
$OPt''''(H_2N)_2.2H(NO_3).3Aq$?
$(NO_3)_2Pt''''(H_2N)_2.2H(NO_3)$

Amo-platinamine (Gros's).

$Cl_2Pt''''(H_5N_2)_2.2HCl$
$Cl_2Pt''''(H_5N_2)_2.2H(NO_3)$
$(HO)_2Pt''''(H_5N_2)_2.2H(NO_3)$
$(NO_2)_2Pt''''(H_5N_2)_2.2H(NO_3)$
$(NO_2)_2Pt''''(H_5N_2)_2.2HCl$

Amo-diplatinamine (Raewsky's etc.).
$Cl_2OPt_2''''(H_5N_2)_4.4HCl.$
$Cl_2OPt_2''''(H_5N_2)_4.4HNO_3.Aq.$
$(NO_3)_2OPt_2''''(H_5N_2)_4.4HNO_3.Aq.$

* 'Philosophical Magazine,' 1869, p. 459.

Law Proceedings.

THE BETTS SUITS.

Vice-Chancellor James's Court, 28*th June*, 1870.

Betts *v.* Willmott, Betts *v.* Potts, *v.* Cleaver, *v.* Field, *v.* Brooks, *v.* Foster, *v.* Pratt, *v.* Stevenson, *v.* Smith, *v.* Hall, *v.* Hart, *v.* Ellis, *v.* Warin, *v.* Cooper, and *v.* Preston.

The suits were, in 1865, commenced against customers of Mr. Rimmel, and they now came on for hearing.

Mr. Willcock, Q.C., and Mr. Everitt appeared for the plaintiff, and Mr. Kay, Q.C., Mr. Eddis, Q.C., and Mr. Langley, for the defendant in each case.

Mr. Willcock, Q.C., opened the plaintiff's case, and was followed by Mr. Everitt, relying upon purchases of one bottle from each defendant, each bottle bearing Mr. Rimmel's labels and a capsule impressed "E. Rimmel, London and Paris, Perfumer," within a bead border.

The Vice-Chancellor, at the close of the plaintiff's case, said,—

In this case the plaintiff, Mr. Betts, has filed his bill against Mr. Willmott, asking an injunction to restrain the defendant from further infringing his invention, from using his invention in this country, and for the consequential damages. It is said, and said with truth, that according to the practice of this Court the *scienter* is not material, that a patentee has a right to file his bill against a person who has innocently infringed his patent, that he is entitled to take legal proceedings at all events. But I am not prepared to hold that every user of letters patent by a person necessarily entitles the patentee not to bring an action in the County Court, but to file his bill in this Court. I think one must look at the circumstances under which, and the extent to which the infringement has taken place, and the conduct of the plaintiff and de endant, before one sanctions such a bill. If it is to be carried to the strict length, it seems impossible to draw a line which would prevent a man being entitled to file his bill against every gentleman who, in this particular case for instance, has a bottle of wine accidentally covered with a capsule in his cellar; I think there is a difference between that case and the case of a person selling articles for profit. If this had been the case of a sale of these capsules for profit, it would have been a different thing, because, in that case, the person would have been selling the metal, and I should have been disposed to interfere, or if the person were using the capsules to a large extent himself.

But I understand all the evidence here is, that a person in the employ of the plaintiff went into the shop of the defendant, and bought there a bottle of a manufactured article, called Rimmel's Toilet Vinegar, the cork of which bottle was covered with a capsule. He bought only one bottle with a capsule on. The probability is, that the defendant had sold other bottles, perhaps he had sold a few dozen bottles in the course of his trade; but he says he had not the remotest idea he was doing anything in violation of the plaintiff's patent; that he bought this in the way of trade from the wholesale dealer, and sold it perfectly innocently; and the plaintiff was informed by the article itself who the person was from whom this innocent vendor obtained it. Under those circumstances, it appears to me, he ought to have given the defendant notice that it was an infringement, and told him not to do so any more; and if he found he was doing it afterwards, he might very well have filed his bill against him, or if the defendant had refused to discover from whom he bought the article. But, no doubt, this defendant would at once have told him, "I got this from Mr. Rimmel; and if Mr. Rimmel is wrong, I will not sell any more, I do not wish to run the risk of a Chancery suit with Mr. Betts." Probably that would have been the case if he had applied to him. But the application he received was this, which does not seem to me to be the right way of dealing with a case of this kind. He says, "I received from Mr. Kent, the plaintiff's solicitor, a letter dated 10th July, stating that he was instructed by the plaintiff to commence proceedings against me for an infringement of his letters patent, by the use and sale of metallic capsules on bottles, which capsules had not been made by the plaintiff, but of precisely similar materials." To which defendant writes:—"I have received a letter from you informing me that I have infringed the patent of Betts' Metallic Capsules. Now, as I have never capsuled, or caused to be capsuled, any bottle or pot in my establishment, perhaps you will have the goodness to let me know in what way I have infringed the patent." To which the answer is:—"I beg to state that the sale by you of the capsules on bottles is the infringement complained of. Any person supplying you is equally liable, and the time will come when you will be interrogated as to who has supplied you, when, and in what quantities." Thereupon, without any further intimations, upon the same 12th of July, on which that answer is made, the bill is served on this defendant. It does appear to me that that was a very violent and oppressive mode of proceeding against this defendant and the others. It is not justified by this observation that, unless you file bills against every retail dealer, you cannot maintain your patent. I do not know whether I should have been able to dismiss the bill with costs, though I think I should have tried to do so, if it had not been for what appears an equally unusual course on the part of the defendant,—instead of saying, "I really did it innocently; I do not wish to litigate your patent;" instead of relying entirely on the facts of the case, the defendant puts in an answer, in which he submits whether the patent is a good one or not. Relying on what he then supposed to be the then state of the law, he takes upon himself to litigate the thing, by raising upon a concise statement, which is almost a cross bill, the very fact of the invalidity of the patent, and he files that statement, and bases interrogatories upon it.

Under those circumstances, it appears to me that neither side has conducted himself in a way which entitles him to the costs of these proceedings; and the order I propose to make is, to declare that the patent having expired, and the Court being satisfied that the infringement by the defendant was innocent, accidental, and trivial, and not such as to have produced any substantial damage to the plaintiff, stay all further proceedings.

Mr. Kay.—Your Honour has not heard our evidence. We have proved distinctly there is no infringement.

The Vice-Chancellor.—Do you mean to say that this capsule is not made according to Betts' patent?

Mr. Kay.—Certainly; there is no evidence of it.

The Vice-Chancellor.—I think there is, unless you have strong affirmative proof that it is not.

Mr. Kay.—We have cross-examined him, and put the article into his hands, and he cannot say whether it is his or not.

The Vice-Chancellor.—He said he could not tell without a microscope.

Mr. Kay.—No; he could not tell at all.

The Vice-Chancellor.—Did you put the capsule into his hand which was bought?

Mr. Eddis.—Yes.

The Vice-Chancellor.—Was there any mark upon it?

Mr. Kay.—There was no mark upon it at all.

The Vice-Chancellor.—Is there the microscopical mark upon it? He swears distinctly it is not his metal, but made of the same material.

Mr. Kay.—If your Honour had heard the cross-examination, you would find it perfectly impossible to maintain any case of infringement. He does not know his own material, and he cannot distinguish between one made by him and anybody else, and he says there is no process which he knows of to enable him to distinguish the things made by him from those made by anybody else. The whole of his evidence has gone to an attempt to make out a case of infringement, which has failed *in toto.*

The Vice-Chancellor.—I did not know you denied the infringement.

Mr. Kay.—Yes, and I am perfectly ready to open the whole case to your Honour, rather than be saddled with our costs of this suit.

The Vice-Chancellor.—I think you must.

Mr. Kay then proceeded to read the plaintiff's cross-examination, but he had only in part done so when the Court rose. It contained passages—

"I have a manufactory in Paris, that is Espinasse's."

"I believe the Paris house supplied Rimmel with a great many capsules at one time."

"I will not swear whether the capsules supplied to

Eugene Rimmel by the house of Espinasse in Paris, either before or after I purchased the business, bore this inscription, 'E. Rimmel, London and Paris, Perfumer;' I may have sworn they did on some former occasion, and if so, it is true."

"I will not swear that each of the capsules on the 11 Exhibits, and on those numbered 211 and 401, was not made by my house of Espinasse, or that they were not sold and delivered by that house to Eugene Rimmel."

Question. In clause 5 of the affidavit of Sandford and another, filed the 18th of January, 1869, in this suit, it is stated that you told them "to the purport that you had been put to a great expense, £20,000, with regard to your patent, and must be reimbursed," whether or not is that true?

Answer. I have no recollection of having had any conversation with Mr. Sandford in particular. I met, I believe, a person of that name amongst others at the Pharmaceutical Society, when I do not believe the words £20,000 ever came out of my mouth. It would be more like at that time, with interest and compound interest, beyond £30,000; and I do not think I ever mentioned such a thing as £20,000. What transpired there I have given an account of in one of my affidavits. It is not true that I then stated, as is mentioned in the fifth paragraph of that affidavit, "that I would sue every retailer in the country who had sold articles capsuled until I had got that sum of money." I told him, and I told them all together as the pharmaceutical synod, that with their vast numbers, their names being legion, a pound a-piece from each would put me straight in the matter; and if the numbers were few, five pounds a-piece would make an atonement for all that had passed, namely, ten years' infringement that had been going on. The reply was that they had no money, and, if that is what you mean, it will be war to the knife. I know the difference between the Pharmaceutical Society and the Defence Committee. One grew out of the other. I did not insist on a payment by the Pharmaceutical Society or its members further than as my bills were filed against any member of that society.

Question. Did you not insist on a contract by the Pharmaceutical Society?

Answer. There were negotiations for peace after this interview, and there were plans suggested for an amicable arrangement of the matters by the Pharmaceutical Society insisting on the foreign merchants who had infringed and were importing their goods into this country dealing with me thenceforward. Certain terms were proposed by me to the Pharmaceutical Society and the Defence Committee, but they were not accepted.

Question. Did not the Pharmaceutical Society as a society always refuse to identify itself with this matter?

Answer. Certainly not. They advanced to me and pleaded guilty to the infringement of my patent from one end of England to the other. I believe that Mr. Rimmel, in my mind, appeared to be the cause of that meeting.

Question. Are you certain that you did not name £25 to any person as the amount to be paid by each?

Answer. I may have said that after they had paid £5 as a penalty to me, the taxed costs of the bill which was filed against them would come to somewhere about £15 or more, and I believe that was about the amount. I think those were the terms on which many were settled with. I thought I must fine them at least £5, so that they might tell the world that they had been so fined, and then it rested between them and my lawyer. I believe I told the people at the Pharmaceutical Society that I could not declare my rights without going at once to that expense of a bill to assert my rights, and therefore I said I could not assert them but at that cost to the one or other of us. I do not recollect whether I named the sum of £25 to be paid to me. I do not recollect whether I said that I had expended £36,000 in costs. I think I said over £30,000, but I did not in words say that I was resolved on being reimbursed. I said there must be something solid, something to eat.

Other material passages appeared in the course of the proceedings.

29th June, 1870.

At the sitting of the Court, the Vice-Chancellor said,—In this case, Mr. Kay, is there any evidence of the infringement except that of Mr. Betts himself?

Mr. Kay.—None, Sir, except the sort of corroborative evidence given in the same words by some of his servants. Mr. Betts himself says in his first affidavit that he firmly believes the capsules are made in infringement of his patent.

The Vice-Chancellor.—There is nothing about capsules in the patent. Where is the evidence that they were not made of metal bought of his Paris house?

Mr. Kay.—None.

The Vice-Chancellor.—What is the evidence of the infringement? What Mr. Betts verily believes is nothing.

Mr. Kay.—And what he says as to it is quite consistent with the fact that they were obtained from himself.

The Vice-Chancellor.—What evidence is there that these capsules are not made of lead purchased from Mr. Betts?

Mr. Willcock.—There is some evidence which my friend has not read. With reference to the actual houses at which it is suggested it may have been bought, we can only give negative evidence as to that. If they had chosen to call Mr. Rimmel, we might have cross-examined him.

The Vice-Chancellor.—What evidence have you given?

Mr. Willcock.—Your Honour will find it at page 7 of the depositions:—"Will you pledge your oath whether those capsules were or not manufactured by your house of Espinasse? *A.* I believe they are infringements, and that they are not of the house of Espinasse. I found this my belief on this, that Rimmel's dies in Paris do not correspond, as I have been informed, with the stamping on those, but I will not swear that they do not correspond exactly. I do not know whether it is the fact that Dupré's capsules supplied to Rimmel bore Dupré's name upon them. The Exhibit now produced and marked W. B. 24, appears to bear a Dupré capsule. It is a tin capsule, and Dupré puts his name on the tin capsules, but not on those made of the patent metal. I do not know whether every die used by Dupré for Rimmel's capsules contained in the inner circle the words 'Paris and London,' or '39, Gerrard Street, London.' It is not known to me that every capsule made by my house of Espinasse for Rimmel bore a bead border. It is not known to me that every Courdouzy capsule supplied to Rimmel bore a rope border. I will not swear that each of the capsules on the 11 Exhibits, and on those numbered 211 and 401, was not made by my house of Espinasse, or that they were not sold and delivered by that house to Eugene Rimmel."

The Vice-Chancellor.—That is not the way to prove infringement. You do not even pledge your belief that they are not made of metal bought from you.

Mr. Willcock.—We do not sell the metals.

The Vice-Chancellor.—It would be monstrous if everybody found with a bottle of this kind were to be considered an infringer. If these bills had been filed at the commencement of the patent, no one would have bought a single capsule. I should have taken the greatest possible care not to do it. I should have said, I am not going to be drawn into a Chancery suit by buying one of these things. Have you any other evidence of the infringement?

Mr. Willcock.—The plaintiff also says, "In answer to the 4th paragraph of the defendant's affidavit, I say that the capsule on the bottle purchased at his shop, as stated in my former affidavit, was not made by me."

The Vice-Chancellor.—It might be perfectly true that the capsules were not made by him. Your patent is not for capsules, but for metal.

Mr. Willcock.—We say we did not sell it.

The Vice-Chancellor.—I see evidence that you did not make the capsules, but I do not see a statement that it was not made of your material.

Mr. Willcock.—We do not sell the material to anybody.

The Vice-Chancellor.—There is no evidence of that fact. I have not seen a particle of evidence of the fact that you do not sell, or that your agents in Paris do not sell, the materials, or that the man at Bordeaux does not sell it.

Mr. Willcock.—I wish to suppose that your Honour is not satisfied of that, and that is why I was going to the other question, because that raises the point which I wished to call your Honour's attention to. The question is put to Mr. Betts, "When you say in your affidavit of April, 1869, that the capsules were not made by you, do you mean to swear that they were not made by your French house of Espinasse?" *A.* I hold that those made by my French house are not made by me as regards England most assuredly. *Q.* Suppose capsules were made at your manufactory at Bordeaux, should you swear that they were not made by you? *A.* Decidedly, in the sense in which I understand it. Unless they are of a certain kind, they have no business to come into this country, and hence would be ignored by me, and so with my Paris or any other house abroad. I explain it in this way. Betts as a manufacturer in France is a Frenchman. I sell capsules there to be used upon bottles, and such capsules may come into this country, but no capsules off bottles of any kind should I make or tolerate to come into England, to have one set against another. There is Betts, an Englishman, and there is Betts, a Frenchman, the one with English rights, and the other with French rights. Those which may come into England are those which bear my patent trade-mark, and my legend round it, and these must come on bottles. The Betts to whom I allude is myself." It is an odd way of putting it very likely, but, at the same time it stands thus. In France his right as a patentee had expired. He manufactures in France, but then what he manufactures in France and sells, the buyer has no right to bring into England. In England he is protected against the infringement.

The Vice-Chancellor.—If I buy from him in France, surely he cannot say that I have no right to bring them into England? Do you mean to say an English patentee can establish a manufacture abroad, and then say that the person to whom he sells cannot introduce the goods into this country?

Mr. Eddis.—If your Honour looks at the next paragraph, you will see these words, "When you have spoken of foreign manufactures, have you included in that phrase yourself as a Frenchman?" *A.* "Yes, in the sense in which I used it."

Mr Willcock.—I submit to your Honour that that evidence is sufficient to establish our case.

The Vice-Chancellor.—I have read the depositions carefully through, and I must say this case seems to me about the most impudent case that ever came into Court. A man says you have infringed my patent. I did not make the capsules which you sell; I am quite sure of that; they were made by foreign manufacture. Then he is asked, Do you include in the term "foreign manufacture" the goods made by your agents abroad? and he says, "I do." I am glad my attention was called to this, because it seems to me monstrous for a man to act in this way. I must say it is not creditable to the plaintiff, when he swears in his affidavit that these goods were not made by him, to divide himself into an Englishman and a Frenchman, and to say that he meant that these goods were not made by him in his English capacity, but that they were made by him in his foreign capacity. I dismiss the bill with costs.

Mr. Eddis.—That will apply to all the suits?

The Vice-Chancellor.—Yes. I am shocked at such a mode of making an affidavit; I hope never to see it again. Each bill is dismissed with costs.

Chapters for Students.

LIGHT.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

1. Light is an agent which is, in many respects, analogous to heat, but there are one or two important differences between them. For example, heat passes through bodies by conduction, and is carried from place to place by convection as well as by radiation; light is known only in the radiant state.

2. Objects are visible only under two conditions:—*a*, when they are self-luminous, that is, when they generate light; or, *b*, when they receive light from some source, and throw it off again (reflect it) in such a way that at least some part of it strikes upon the nervous apparatus of the eye.

3. Bodies may be arranged in a rough way into three classes, according as they permit light to pass through them or not.

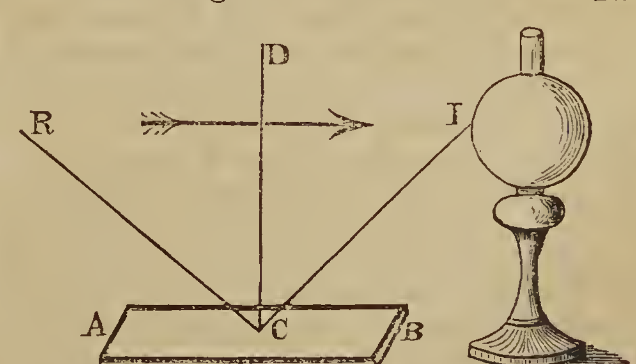
Transparent bodies, such as ordinary window-glass, are those which transmit light without sensibly scattering it. Objects are, therefore, visible through such media without alteration of outline.

Translucent bodies, for example, ground glass or fog, scatter the light which passes through them in such a way that the outlines of objects seen through them are confused or even obliterated.

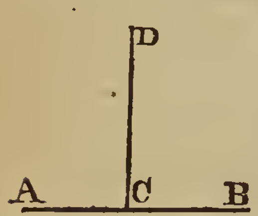
Opaque bodies are those which stop and absorb or reflect all the light which falls upon them.

There is no such thing as perfect transparency, for even air and white glass stop a part of the light incident upon them, and there is probably also no such thing as perfect opacity, for even metals, when they can be beaten thin enough, transmit a little light.

4. When a ray of light falls on a perfectly smooth surface, the whole or part of it is rejected, and it takes a new course, which is inclined at an angle to its former course. This is reflection. The law by which the direction of the reflected ray is regulated is expressed usually thus:—"The angle of incidence is equal to the angle of reflection." Suppose A B



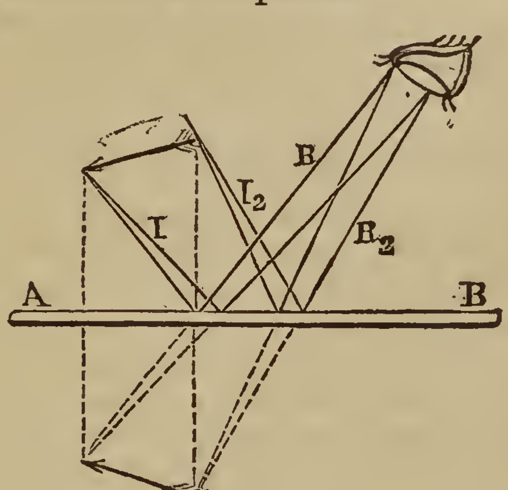
to represent the surface of a flat mirror; I, a ray coming through a small hole in the shade of the lamp, and "falling upon" the surface of the mirror, may be called the incident ray; R, the course into which it is "bent back," is the position of the reflected ray. If now a line, real or imaginary, be drawn to the surface of the mirror at the point C, the law tells us that the incident ray, I, will always form with C D the same angle that R forms with C D. And the three lines, I, C D, and R, will always be in the same plane; that is, if three rods attached to a board in the position of the lines in the figure, were used as a model, and the eye of the experimenter looked in the direction of the arrow, he would see the three coincident and appear as one.



In an experiment with a mirror he would see from this point a spot of light on looking down R, and in the direction of the arrow, he would see the hole in the lamp-shade. It will, of course, be understood, that the number of rays proceeding from the lamp are infinitely numerous. In a diagram, the course taken by one only of them can be shown with distinctness. But all of those which fall upon the mirror are reflected from their various points of incidence, according to the same law.

5. In the preceding experiment the spot of light would appear to proceed from behind the mirror. This is also the case with images of persons or things seen in ordinary looking-glasses. As a general rule, an object appears to be in the direction from which the rays which meet the eye last proceeded.

The experiment described makes use of a ray proceeding from a luminous point. The *image* of an object is the result of the association together of an infinite multitude of such points.



Suppose A B the surface of a mirror. The lines I and I_2 represent the paths of rays falling from the extremities of the arrow upon the reflecting surface. Between them there should be an infinite number of similar rays proceeding from the intermediate points. R and R_2 are the paths of the two rays represented after reflection. The arrow, therefore, seems to be in the position shown by the dotted lines, which are a continuation of R and R_2, and it appears to be at the same distance behind the reflecting surface that it is in reality in front.

In this diagram, again, it has been possible to represent only those rays which, after reflection, meet the eye. From every point of the object, however, it will be understood that rays proceed in every direction; those which are thrown downwards fall on the mirror and are reflected, and of these only a certain number, viz. those whose paths of reflection lie between R and R_2, are received in the eye.

6. Ordinary objects are visible from almost any position the experimenter may take up; the reason is, that the rays of light thrown off from objects in general are distributed in an infinite number of directions, owing to the irregularity of their surfaces. A beam of light entering through the shutter of a darkened room, and falling upon a sheet of paper, will do more to illuminate the room than if it fell upon a mirror. In the latter case, the light will be reflected in one beam, and will afford only one bright spot, instead of being distributed in all directions.

Reviews.

Manual of Qualitative Analysis. By Robert Galloway, F.C.S., Professor of Applied Chemistry in the Royal College of Science for Ireland. Churchill and Sons. 1870. Fifth Edition.

The title page of the volume before us informs us that we are presented with a fifth edition. This fact implies one or both of two things: either there is an extraordinary demand for treatises on qualitative analysis, or Professor Galloway's book is better done than others of its class.

Whilst we most willingly accord to the author of this work the large measure of praise which he undoubtedly deserves, we cannot withhold, at the same time, our opinion, that there is yet room for a good manual of qualitative analysis; we might say for two good manuals, for we should like to see every one of those already existing submitted to a process of sifting. For beginners we ought to have displayed all the most important principles deduced from just so many familiar facts as would serve to establish them in the mind of an intelligent school-boy or girl; they would then be in a position fairly to attack the subject as it is presented to them in the ordinary handbooks. When a child is first regularly instructed in writing or drawing he goes through a course of "pothooks and hangers," which, if they have no substantive value of their own, familiarize him with the nature of the work he has before him, and the tools he has to use; but in science, as generally taught, the unlucky juvenile is plunged, heels over head, into the waters of technicality, the shallows or the deeps of which he will be equally lucky if he escape. As an experiment, we should like to see some one subject, say botany, taught by the guidance of a gradational series of lesson books, similar in general principle to ordinary school "copy-books."

Professor Galloway has already made an attempt at something of this kind in his 'First Step' and 'Second Step' in chemistry, but we wish we could think he had done so with absolute success. His 'Qualitative Analysis,' which we have just most carefully examined, has given us the impression, however, that he has considerably improved with his experience in writing, and particularly in arranging. If he would now let the present volume stand as a *second* step, and would take the trouble to compile another about one-third of the size, and, not disdaining small matters, make it really suited to beginners, he would deserve the thanks of all chemical teachers.

Chemical analysis is an art; its success depends, in greatest measure, upon the judicious selection of the devices by which the characteristic properties of bodies are brought most prominently into view. One defect of the work before us is, that it fails to stamp with sufficient distinctness the diagnostic marks of each radicle and group of radicles. Unimportant properties and reactions are made as much of, except in the tables, as the most distinctive, and consequently the student finds none of those salient points to grasp at which ought to be ready to his hand. We feel bound to say, however, that there is evidence of very careful work. There are throughout, so far as we have been enabled to detect, no statements which are fundamentally incorrect.

We like the tables for contrasting the characters of the members of the several groups of basylous radicles, though we demur to the author's appropriation of all the credit due to the plan, for we find the same thing in a slightly different form in many other books.

There seems to have been great pains taken to give the latest information, and no process of importance is omitted.

Part II., devoted to the consideration of organic substances, contains a great deal of useful matter, which is generally rather shirked by writers on analysis.

Part III. includes a description of the common operations, solution, filtration, and the like, an account of Bunsen's flame reactions, and an enumeration of the reagents commonly required. Altogether, we have the groundwork of a very excellent guide for the student. If the author in the sixth edition, which he is pretty certain to reach, would consent to the excision of a considerable amount of matter, not incorrect, but foreign to the subject in hand; if he would carefully purify his pages of a number of trifling erudities and inaccuracies; and, lastly, by putting in a few good strong dashes of light and shade, make it less like a young lady's water-colour drawing, one tint all over,—he would bring his 'Manual' to a position of completeness and solid usefulness which would bid fair to double its already large circulation, and make it the leading text-book in our schools.

Index to the Native and Scientific Names of Indian and other Eastern Economic Plants and Products: prepared under the authority of the Secretary of State for India, by J. Forbes Watson, M.A., M.D., F.L.S., etc., Reporter on the Products of India. London: India Museum. 1868. Royal 8vo. Pp. viii., 637.

Though somewhat late, we now proceed to notice the above work, the publication of which we announced some time ago.

The trade which this country enjoys with India is so great in extent and in the variety of its articles, that such a book of reference as the above will be warmly welcomed by all connected therewith. To the economic botanist it will prove a valuable aid in the determination of the many new or rare products which from time to time find their way into the English markets.

These vernacular names are compiled from various publications on the botany, Materia Medica, and products of the East. Upwards of one hundred works, beside much manuscript matter, have been waded through to produce the present Index.

The work does not lay claim to be anything but a compilation. No critical examination of the orthography or correct bestowal of the names has been attempted; they are simply quoted as given by the authors from whose works they are taken.

Besides being a useful index, the book contains an immense amount of information. After the name, the language from which it is derived, and the plant to which it is applied, we have references to works where the word occurs and where information can be obtained respecting the substance; thus, under the various spellings of the fruit of *Ægle Marmelos*, as Bael, Bel, Bele, Beli, etc., we counted no less than seventeen references.

What we should very much like to see, would be a companion volume to the present one (and from the preface we are led to expect another), in which, under the botanical name, the various vernacular names are arranged, and concerning which the locality where used, synonymy, whether pure or introduced, derivation and meaning, whether collective or individual names, and whether applied to the plant as a whole or to its parts or products, would be stated.

In addition to the correct orthography of the name being given, they could be spelt as pronounced, according to Mr. Ellis's 'Glossic System,' which the English Dialect Society propose following in their 'Dictionary.' Of course this would entail much critical labour, but, with the resources at the command of the Indian Government, could undoubtedly be done; and such an Index, provided with copious references to works where the words occur, would be an immense boon to all scientific and commercial men, besides being of great philological value and interest. We say this not in any disparagement of the present work, but having felt the value of this, we long for a second, such as we describe, and which we are sure would meet with great success.

BOOKS RECEIVED.

The Unity of Medicine; its Corruptions and Divisions by Law Established in England and Wales, their Causes, Effects, and Remedy. By Frederick Davies, M.D., etc. etc. Second Edition, revised and extended to Ireland and Scotland. London: John Churchill and Sons, New Burlington Street. 8vo, pp. 302. 1870.

The Half-Yearly Abstract of the Medical Sciences. Edited by William Dornett Stone, M.D., etc. Vol. LI. January–June, 1870. London: John Churchill and Sons, New Burlington Street. 1870.

Philadelphia College of Pharmacy.—At a meeting of the College on the 27th of December last, the following gentlemen were elected corresponding members of the College:—Prof. John Attfield, London; Henry B. Brady, Newcastle-on-Tyne; John Abraham, Liverpool; T. B. Groves, Weymouth; C. R. C. Tichborne, Dublin; F. Crace Calvert, Manchester; John Mackay, Edinburgh; W. W. Stoddart, Bristol; J. C. Brough, London.

Society of Pharmacy, Paris.—We observe that Prof. Attfield and Mr. J. Collins have been elected corresponding members of this Society.

Suffocation by Carbonic Acid Gas.—An inquest has been held on the bodies of four men, John Smith, Edward Jones, Samuel Hassall, and Thomas Bedson, who were suffocated in a tube used to convey waste gas from the blast furnace to heat the furnace boilers at the North Staffordshire Coal and Iron Company's works at Talke. This waste gas, which is very light, is conveyed in a pipe 150 feet long by 4 ft. 6 in. diameter. It appears from the evidence that the works had been stopped for the purpose of cleaning the tube, and effecting some slight repairs, and Smith, the manager, with his assistants, Jones and Hassall, went to see to it. Shortly afterwards they were missed from the premises, and Bedson, in his search, entered the tube, where he also fell a victim to the gas. Attached to this tube is a large air-tube used to supply fresh air; and it seems that Smith, in his anxiety to get the repairs done, had omitted to take the precaution of clearing the tube of the gas.

Dr. A. Greatorex deposed that the cause of death was poisoning by carbonic acid gas, and the jury returned a verdict accordingly.

Dr. Percy, of the Royal School of Mines, in a letter to the 'Times,' referring to this lamentable accident, states that the poisonous ingredient of this so-called "waste gas from the blast furnaces" is carbonic oxide, the inhalation of which, whether pure or mixed with common air, rapidly destroys life. He observes that as the use of this "waste gas" for heating steam boilers is extending daily, it is important that managers of such works should be acquainted with its highly poisonous nature, and take every precaution to prevent their workmen from being exposed to its influence.

Ice.—The following singular formation of ice is recorded in the 'Central India Times,' as occurring in the Chanda district, at the village of Warrora. On the 23rd of February last, when an endeavour was made to empty a reservoir connected with a tank at that place, by opening the drainage pipe, it was found that the water would not flow. To ascertain the cause, the tank was pumped dry, when it was found that a solid mass of ice, some three feet in length, had been formed, completely choking the mouth of the pipe. When removed, it appeared opaque, somewhat similar to machine-made ice. The soil under which this phenomenon occurred is the common black loam of the Deccan (cotton soil), the piping of ordinary potter's clay, cemented at the joints with a composition of lime, linseed oil, and cotton, pounded up together, and the protecting masonry of the indigenous sandstone and mortar. The water in the reservoir and pipe had remained perfectly still for about six months previously, the pipe having been closed during that period. It is scarcely necessary to say, that the temperature at Warrora never at any time even approached freezing-point.

The Riga Pine.—M. Keller, of Darmstadt, writing in 'Cosmos,' says, that what is known outside Russia as the Riga Pine, and which has been praised for its specially good qualities, is unknown by any distinctive appellation at Riga, and is, in fact, nothing more than the ordinary *Pinus sylvestris.—Athenæum.*

The Treatment of Smallpox. — At one of the meetings of the "Vaccine Congress," in Paris, M. Jaffin brought forward not only a *specific* for smallpox, but one which he "has always found successful in every description of epidemic disease"! The remedy consists of a gramme of quinine dissolved in 120 grammes of an opiated vehicle, of which a tablespoonful is to be taken every two hours.

Obituary.

On the 27th of May, at Great Marlow, Mr. Robert Foottit, chemist.

On the 24th ult., at Shepherd's Bush, Mr. William John Beaton, son of Mr. John Beaton, of Kilburn, one of the founders of the Pharmaceutical Society.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

Betts's Suits.

Dear Sir,—I feel that I am only fulfilling my duty by at once returning my most sincere thanks to yourself and those kind friends who rallied round me with their advice and pecuniary assistance during the many years the suits 'Betts *v.* Willmott and others" have been going on.

I would at the same time congratulate the trade on the satisfactory termination of those suits as announced in your last issue.

I am, your obedient servant,
William T. Cooper,
Chairman of the Betts Defence Committee.

26, *Oxford Street, W., July 5th,* 1870.

Regulations for Storing Poisons.

Sir,—Now that the battle of the Regulations has been fought, and the danger of having vexatious restrictions imposed on our dealings with a large number of articles being over for the present,—it may be well to consider our future action in the matter. The subject has assumed an altered aspect since the Annual Meeting, for it now appears that the Privy Council, and not the Pharmaceutical Council, were the active parties in the scheme; and as it seems they require the adoption of *some* legal regulations for the keeping of poisons (the necessity for which I by no means admit), the opponents of the former proposals may perhaps be expected to assist in the endeavour to devise some plan that shall be practicable, and more likely to meet with general adoption. Not that I fear more onerous burdens being imposed on us without our consent; we have defeated "Poison Bills" before, and can do so again if need be, but perhaps it may be possible to discover some plan that shall effect all that is desired and satisfy the Government, without interfering too much with the arrangements of our shops or the requirements of our trade; and if the matter be well discussed in your columns, a more acceptable scheme may doubtless be arrived at before the next Annual Meeting.

It may, perhaps, assist in the discussion if the "Poison Schedule" be given *in extenso*, so that people may see what it really contains; and the following, I believe, will be found to comprise nearly, if not quite, every article that may fairly be included in the list:—

List of Poisons within the Meaning of the Act.

PART I.

Arsenic, Alb.	Morphiæ Acet.
„ Sulph. Flav.	„ Hydrochlor.
„ „ Rub.	„ Mecon.
Ferri Arsenias.	„ Sulph.
Liq. Arsenicalis.	Nicotine.
„ Arsen. Hydrochl.	Strychnia.
„ Arsen. et Hyd. (Donov.)	„ Liquor.
Scheele's Green.	Veratria.
Sodæ Arsen.	Cantharides.
„ „ Liquor.	Corrosive Sublimate.
Aconit. Extr.	Cyanide of Mercury.
„ Folia.	„ Potassium.
„ Linim.	„ Silver.
„ Rad.	„ Sodium.
„ Tinct.	„ Zinc.
„ „ Fleming's.	„ Potass. Solut.
Aconitia.	Emetic Tartar.
Atropia.	Ergota.
„ Liq.	„ Ext. Liquid.
„ Sulph.	„ Infus.
„ „ Liq.	„ Tinctura.
„ Unguent.	„ Liq. Secale Corn.
Brucia.	Prussic Acid, B. P.
Codeia.	„ „ Scheele's.
Conia.	Savin.
Digitalin.	„ Oil of.
Morphia.	

Fifty-three articles.

PART II.

Almond, Ess. Oil of.	Opii Extr. Liquid.
Belladonnæ Extr.	Linim. Opii.
„ Fol.	Liq. Opii Sed.
„ Linim.	Nepenthe.
„ Rad.	Pil. Ipec. c. Scill.
„ Tinct.	„ Plumbi c. Opio.
Canthar. Acet.	„ Saponis Co.
„ Liq. Epispast.	Pulv. Ipec. Co.
„ Tinct.	„ Kino Co.
Chloroform.	„ Opii Co.
Hyd. Bichlor. Liquor.	Tinct. Opii.
„ Lotio Flav.	Vinum Opii.
Morph. Acet. Liq.	Poppies, Ext. of.
„ Hydrochl. Liq.	„ Syrup of.
„ Mecon. Liq.	Oxalic Acid.
Opium.	Precipitate, Red.
„ Pulv.	„ White.
„ Extr.	Vermin Killers innumerable.

Thirty-six articles.

Being a total of 89 articles affected by the Pharmacy Act.

Now one of the chief objections to the late proposed "Regulations" was their application to every article in the above list, and it was felt not only to be impracticable to apply such stringent restrictions to so great a number of articles, but contrary to common sense to require the same rule to be adopted with articles differing so widely in their potency as they do.

A poison-closet, to be any element of safety, must be confined to a very limited number of the most powerful and dangerous articles. A cautious chemist would hardly like to put tartar emetic or morphia in the same cupboard with aconitia or strychnia, but would rather keep them as far apart as possible. Besides, it is nonsense to talk of shutting up such articles as cantharides, or ergot, or opium, or savin, or aconite, or belladonna, and many others, or even red precipitate or sublimate, in a poison-closet,—there is scarcely any one of these that could possibly be mistaken for anything else, except by the grossest carelessness or ignorance: and as to the idea that any one would attach a peculiar sanctity to such a poison-closet, or approach its doors with fear and reverence, we may be very certain that when he knows perfectly well that four-fifths of the articles contained in it can hardly be called either dangerous or deadly, the poison-closet would soon be considered of no more importance than any other part of the shop.

The same reasons hold good in regard to labelling with the word "poison," and the use of angular or other fanciful bottles. The word "poison" put on bottles containing tartar emetic, Dover's powder, syrup of poppies, tinct. belladonna, and others of like nature, would convey no warning to the mind of the druggist, and might probably create unnecessary alarm in that of the customer, whilst the use of angular bottles for such articles as those, would destroy their value (*if they have any value*) as safeguards for more dangerous substances.

In short, by far too many and too widely differing articles were affected by the proposed regulations, and if we *must* have regulations on the subject, they should be confined to a few of the more deadly and dangerous poisons and their names specified, if they are to be of any service and receive general adoption.

I am, Sir, yours sincerely,
W. Wilkinson.

Cheetham Hill, June 20, 1870.

The Late Election of Council.

Sir,—It appears to me that the constitution of the Society, rather than the judgment of its members, has been at fault in the late election of Council. I agree with Mr. Ince in thinking that there is too great a proportion of the country element in the Council, and for the reason, and only for the reason stated by him; in other respects a better selection of men could hardly have been made. On looking over the new list when it first appeared, I thought we had done well, and it was on reading the much but unjustly complained of leader in the supplementary number of the Journal, that I became fully impressed with the importance of studying something more than the quality of the men in arranging the composition of the Council. I am not so thin-skinned as Mr. Proctor appears to be, and was thankful that our attention had been drawn to this subject by an article likely to be read and pondered over; not written in the namby-pamby milk-and-water style to which Mr. Proctor would limit the editor of our Journal. In reading the article in question, and the comments upon it which have since been published, I have been anxious to form an impartial judgment, although perhaps with some of the prejudices of a provincial; but I can see nothing in the article to call forth the severe animadversions which have emanated from Newcastle. The discussion which has taken place may, however, raise the question, whether a journal, such as ours has become, is a suitable organ of communication in a Society, the members of which may be strongly opposed to each other on points affecting or supposed to affect their trade interests. It surely implies no small commendation of the editorial management of the Journal since it has been the property of the Society, that now, for the first time in eleven years, the judgment and impartiality of the editor have been called in question, and only now, when his position and influence had been previously weakened. But the circumstances by which the Society is surrounded are undergoing a change, and judging from recent manifestations, it is hardly to be anticipated for the future that there shall be that unanimity in the Council, and freedom from party spirit among the great mass of the members, which have characterized the past. Under such conditions the Journal may become a source of weakness rather than strength, and it behoves us well to consider upon what principles it is to be conducted. Let the Society either confine itself to the publication of its transactions as other scientific Societies do, or if it determines to seek influence through journalism, let it invest the editorial function with such a balance of responsibility and freedom from undue control, as may be at once consistent with the interests of the body at large, and with the spirit of honourable independence so essential to the efficient performance of editorial duties. I hope never to see the Journal of our Society become "the mere tool of the Council." One of the objects of the Journal should be to promote the temperate discussion of questions appertaining to the management of the Society, and among other important points to the composition of its Council. That provincial interests should be fairly represented is admitted by all; nor will it be denied that there is a large number of members in the Provinces, and in London also, in every way fitted to take part in the deliberations of the Council, who have never yet had a seat there. It is not desirable that the office of councillor should be permanent, or that the metropolitan element in the governing body should be so weak as to interfere with the efficient performance of the work to be done. The question is, how are we to provide for the election from year to year of a Council in which all the requisite conditions are maintained, in which town and country are sufficiently represented, in which old blood and new are duly mixed, and opportunities afforded for rising talent to manifest its abilities at the Council-board? In other Societies it is customary to have these things regulated by the bye-laws, but in our Society there is an absence of any such regulation. The consequence of this has been that that which is not officially done has been undertaken by those who, dissatisfied with the old system of following the stars, and being at the same time desirous of a change in the Council and an infusion of new blood, have sought to accomplish this through the influence of circulars, and other methods of canvassing. Now is it possible that the government of the Society should be satisfactorily conducted in this way? If committees at Manchester and Leeds are to influence the election of Councillors, why not others throughout the country? And what would be the result of this? Why, that party spirit would be fostered, and members of Council would be seeking to satisfy the requirements of those through whose influence they were elected, instead of studying the interests of the body at large. I say, then, the constitution of the Society is at fault, and the proper remedy for the defect will be the adoption of a bye-law limiting the number of provincial members of Council to (say) not more than ten, and limiting the period during which a Councilman can continuously hold office to not more than five years, but admitting him to election again after the lapse of a year.

Provincialist.

An Age of Progress.

Sir,—Of the two parts into which Mr. Ince's letter of last week is divided, the first, which has reference to the publication of the proceedings of the Council, possesses by far the more enduring interest.

It is much to be regretted that a man of his standing should have thrown the weight of his influence into the scale against publicity, from which progress is inseparable; and I would ask him in all sincerity, to consider well whether his reasons are not of the same character as those that have always been advanced, to be always in the long-run overruled by the opponents of wholesome publicity—from the case of proceedings in Parliament down to those in metropolitan vestries, and Boards of Guardians. Indeed, the analogy between the positions of members of Parliament and members of Council is too obvious to be easily overlooked; and how ridiculous would be the position of a constituency proceeding to elect its members in total ignorance of their opinions, and without the means of learning them, either by canvass, by address, or by speeches in the House! Mr. Ince, dwelling, as one may say, in the vortex of pharmaceutical life, and personally acquainted with the leading members of the Society, can have but little difficulty in selecting his candidates, but I question much whether he has realized, or indeed can realize, the difficulties of individuals less favourably situated; and I assert, without much fear of contradiction, that for the majority of members, and with the exception of a few well-known names among the candidates, a mere rule of thumb, which should lead to the striking out of alternate names or of the redundancy at the end of the list, would usually give results equally satisfactory with those at present obtained.

As a point of etymology, Mr. Ince's definition of the word Council must no doubt be accepted as correct, but examples are not difficult to find, in which it obtains a wider meaning; indeed, Mr. Ince has at this moment a notable opportunity for earning the gratitude of the Pope, and lasting renown for himself, by suggesting the means for banishing *discussion* from the great Council of the Church now sitting at

Rome—to which, by the way, the word *consilium* more especially applies.

Mr. Ince puts forward three objections to publicity. First, that most of the proceedings are of a conversational nature. So, frequently, are those of the houses of Parliament when in Committee—not to speak of vestries and such-like, which are reported without difficulty every day; nor is it to be supposed that *verbatim* reports are required. Secondly, he is afraid of not being recognized as the father of his own offspring, from the circumstance that he has sometimes made a mouthpiece of another member. I reply that he has the remedy in his own hands, and can by no possibility be worse off in that respect than he is now. His simile of the signpost is a good one, but he would hardly wish to destroy such signs because *one* had sent him in a wrong direction. His third reason is even more unsatisfactory. Why the debates which occasionally arise must of necessity be of a personal nature I do not know, though I am bound to accept his statement; but of this I am certain, that if any member can so far forget himself as to make use of personalities, or make statements the publication of which will "sow an abundant harvest of ill-will, misunderstanding, and estrangement," it is highly desirable that he shall be known to the Society at large. Nor is a feeling of uncertainty as to who may next suffer under the tender mercies of the Council likely to make us less desirous of the safeguard of publicity, of the necessity for which Mr. Ince has now himself supplied us with conclusive proof.

Charles Eve.

Hampstead, July 4th, 1870.

Sir,—May I be allowed space for a few remarks on the "Age of Progress"?

In common with many others, I feel annoyed that every now and then the Journal of our Society should be made the medium for propagating strictures and remarks which are quite uncalled for, and reflect injuriously on large numbers of the Society's friends.

The members of the Society last month elected in the usual way a new Council. Immediately on this being done, there appeared in the Journal a somewhat extraordinary leader, commenting very freely on the matter, and hinting, in no indistinct manner, that the Society had done a very foolish thing in electing such a Council. The grammatical peculiarities of the leader sufficiently indicated its author, and Mr. Ince has since acknowledged it. Had it appeared at the end of the Journal among the "Correspondence," it would probably have been regarded as representing the opinion of an individual member, and have called forth no comment; but, appearing with the editorial sanction, it was looked on, and naturally so, as representing the opinions and feelings of those who conducted the Journal.

Now, Sir, comments of the kind contained in that leader could only have been excusable had they appeared at the end of the new Council's year of office, and after, on its part, twelve months of gross mismanagement and neglect of the interests of the Society. Coming as they did, at a time when neither Mr. Ince nor any one else could have had the slightest reason for judging it, or supposing that it would prove incompetent or indifferent, they must be considered to have been quite uncalled for, and to have had no ground, either in justice or good taste.

The present Council has been chosen by the Society in the regular way, and to prejudge its action, to condemn it before trial, is a proceeding quite without parallel. Imagine the Geographical and Geological Society electing its Council, and then allowing its principal journal to speak of that election as Mr. Ince has spoken of ours. Should the Council prove incompetent, the Society will be able, at the proper time and in the proper way, to intimate its disapproval, and take proper action with regard to it. It is not wise to jump to the conclusion that, because its members are scattered over the country, they will be unable properly to attend to their duties, and that, therefore, the Society has done a very foolish thing in electing them.

I am sure that others, as well as myself, have derived both instruction and pleasure from much that Mr. Ince has written, and I regret that he should ever employ a pen—so capable of benefiting the Society, and adorning the pages of the Journal—in writing articles that causelessly rouse hostile feeling, and tend to produce that discord which already constitutes our principal weakness.

York Town. A. H. Claypole.

Sir,—I hail with satisfaction the first weekly issue of the 'Pharmaceutical Journal,' and gladly accept as an omen of impartiality the juxtaposition of Mr. Proctor's and Mr. Ince's letters. It will astonish most of your readers to learn the authorship of "An Age of Progress," and the unsatisfactory explanation will but increase the surprise. Rightly or wrongly, I have been wont to attribute to Mr. Ince a remark I read some years since in recommending the study of French (in which I fully concur), that devotion would suffer little by an occasional attendance at a French service. But if "An Age of Progress" is an example of the effect of studying French, I imagine the advantage is more than doubtful: style will not be much improved, while moral tone will be certainly lowered. Possibly the recollection of the common French adage, "Qui s'excuse, s'accuse," would have prevented Mr. Ince's letter in your last; but, in recollection of many interesting and valuable contributions from the same pen, we shall be glad to forget this last infirmity.

I trust, Sir, that you will not insist, as one of your correspondents suggests, upon the name and address of every writer. Great names are wont to carry more influence than they merit at all times; while anonymous communications are more likely to be estimated at their intrinsic worth. "We want measures, not men." There are some subjects, too, to which it would be highly undesirable to subscribe one's name. Such a subject is the appointment of local secretaries. I have an ardent desire to see the secretaryship of my own neighbourhood more worthily filled; but I should be extremely sorry to offend a neighbour, who is very worthy in many respects, by indicating my name or residence, neither would I thus put myself forward as a candidate. We want men as local secretaries who are not merely the "fathers of the trade" in age, but who are comprehensive enough to study the interests of the trade at large, whether in or out of the Society,—men, who not only collect members' subscriptions, and make an annual appeal on behalf of the Benevolent Fund, but who are in harmony with the spirit of the times, and have at least some sympathy with the measures and objects of the Pharmaceutical Society. I regret the apathy of chemists in this matter. I thank "Quintus" for his suggestions, which I, for one, should be glad to see carried out, as well as many others that might be made.

I enclose my card, and am, Sir,

Yours truly,
Henricus.

July 5th, 1870.

A. W. (Lowestoft).—*Unguentum Sulphuris Hypochloridi Compositum.* The formula will be found in Vol. X., page 66; but, for the convenience of those who may not have the early volumes, we repeat it here.

℞. Sulphuris Hypochloridi ʒij
Potassæ Subcarbonatis gr. x
Adipis purificati ℥i
Ol. Amygd. Essent. ♏x. M. ft. unguentum.

B. N. (Northampton).—We are not acquainted with Startin's 'Treatise on Diseases of the Skin.' A course of lectures on 'Chronic Diseases of the Skin,' by Mr. Startin, were published in the 'Medical Times and Gazette,' vols. xiii. and xiv.

W. L. W. (Torquay).—We believe there is no such law.

H. S.—There is no such name registered in or near London.

I. T., *H. S.*, and *A Lover of Fair Play* have sent us communications on the "cutting" system adopted by some chemists, with lists of prices charged, from which we may quote the following:—Seidlitz powders, 1*d.* each; children's powders, 1*d.* each; castor oil, 2*d.* per ounce; blue pill and black draught, 4*d.*, etc.

Aspirant should apply to the Secretary of the Apothecaries' Company.

W. P. Parry (Hammersmith) thinks that chemists ought to meet and consider what steps should be taken to counteract the injurious effects produced by co-operative stores.

A. P. S.—An Associate who has passed the Modified Examination is not entitled to call himself "Pharmacist."

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W.*

THE CHEMISTRY OF THE ATMOSPHERE.

BY J. ALFRED WANKLYN.

A first glimpse at the minute but potent constituents of the atmosphere, is afforded by Dr. Angus Smith's reports under the Alkali Act passed in the year 1863. As is doubtless known to many of our readers, it is the business of the Government Inspector under this Act to take upon himself the office of Conservator of the Atmosphere in the manufacturing districts, and in the discharge of his duty the Inspector has had before him the task of distinguishing between polluted and non-polluted air. His results, especially those just published in the report for the year 1869,* appear to us to be of the highest interest.

That the air of a close room is different from the air of a well-ventilated room; that air indoors is different from air outside; that the air of a town is different from the air of the country, and that the air of one country-place is not quite the same as the air of another country-place,—all this is matter of common observation. But wherein these differences consist has been, up to the present time, involved in the greatest obscurity, and is now, for the first time, becoming intelligible.

Towards the close of last century, immediately on the discovery of the main composition of the atmosphere, viz. that it consisted of a mixture of nitrogen and oxygen, and that the important processes of combustion and respiration consisted in chemical action of the latter on the combustible burnt or on the tissues of the animal which breathed,—the idea arose that the differences between one atmosphere and another depended on richness or poorness in oxygen. This idea, in itself so plausible, was fostered by the irregular character of the analytical results furnished by the method of analysing air, which was in vogue at that early period in the history of chemical analysis.

Many of these early measurements of the quantity of oxygen in the air were made by observing the contraction which a volume of air underwent when subjected to the action of nitric oxide. Very accurate results are possible when this process is properly performed (Cavendish got excellent results with it), but sources of error, which we understand at the present day, though they were not understood when it was in use as an analytical process, prevented the general attainment of accurate results at that period. Thus it was that great variations in the proportion of oxygen in the atmosphere were regarded as having been found by chemical analysis, and to this source may be traced those curious errors which have survived to the present day in the discourse of the itinerant lecturer, and even of the medical practitioner (in foreign countries as well as at home) who opens the window *to let in oxygen*, and is *oppressed by the excessive accumulation of carbonic acid.*

With the modern improvement in the methods of eudiometric analysis, the truth became apparent, that the proportion of oxygen in the air is very nearly constant,—Regnault, Bunsen, and all modern chemists who have examined the composition of the atmosphere, being unanimous on this point. The following determinations may be quoted:—

	Oxygen per cent.
Air from sea-shore, Scotland	20·999
,, the summit of hills, Scotland	20·980
,, suburb of Manchester . . .	20·980
,, ,, . . .	20·960
,, St. John's, Antigua	20·950
,, a close sitting-room	20·890
,, pit of a theatre, 11 P.M. . .	20·740
2 Feb. 1866. Court of Queen's Bench .	20·650

The air of a crowded room therefore contains very nearly as large a proportion of oxygen as the air of the open country. Furthermore it has been shown that great variation in the proportion of oxygen may be made without any corresponding physiological effect being produced on animals breathing such an atmosphere.

For the essential distinctive characters of different atmospheres we cannot, therefore, look to the relative percentages of oxygen in different specimens of air, but must look to other criteria. In truth, the sanitary chemistry of the atmosphere is very much like that of water; being, like the latter, concerned with very small quantities of impurities present in very large quantities of the main material. Pursuing this analogy, which may be of service in conveying a just idea of the character of atmospheric impurities, the carbonic acid present in air may be likened to the total solids contained by waters. In 100,000 volumes of average air there are about 34 volumes of carbonic acid. In 100,000 parts of average Thames water, as supplied to the metropolis by the water companies, there are about 28 parts of total solid residue. Moreover, the slight percentage of carbonic acid in the air is just as harmless as the main bulk of the total solid residue of water, and the extent of variation which actually obtains in the amount of carbonic acid in badly ventilated rooms is quite too small to be of physiological importance.

The following numbers will serve to give an idea of the actual quantities of carbonic acid which occur in different specimens of air.

100 volumes of air	Vols. of CO_2.
From the hills in Scotland contain	0·0332.
From surface of Thames (London)	0·0343.
Neighbourhood of middens contain	0·0774.
Worst parts of theatres ,,	0·3200.

The proportion of carbonic acid in the worst of these specimens of air, and probably a far higher proportion of carbonic acid, would be without physiological importance.

It is not the carbonic acid, but matter existing in air in far smaller quantity, which determines the physiological character of different atmospheres.

Referring to the report just issued, it will be seen that Dr. Angus Smith has recognized atmospheric pollution by acids, salts, and nitrogenous organic matter, the latter having been detected and measured by the ammonia-process.* The absence of vegetation in the northern manufacturing towns, and in the neighbourhood of many kinds of chemical works, is ascribed, in great part, to the presence of free acids, such as sulphuric and hydrochloric in the atmosphere; and the possibility is suggested, that to the presence of traces of different saline substances in the air of seaside watering places, may be due some of the sanitary effects which attend a sojourn in places of that description.

* Sixth Annual Report of the Inspector under the Alkali Act of 1863. London: Eyre and Spottiswoode.

* Journal of Chemical Society, 1867, vol. v. p. 445.

In reference to the nitrogenous organic matter, it is established, in a general way, that open country air contains very little, and that town air, especially that of unhealthy towns like Glasgow, contains comparatively much; also, that the air of close rooms and of privies contains comparatively much. The air of open places in London stands this test well; and, as is so well known, London is remarkably healthy.

A curiously close parallelism may be traced between the "organic character" of air and that of water.

Thus, from the data to be found in the report, it appears that one kilogramme of air collected in different parts of Chelsea (London), gave 0·035 milligramme of free ammonia, and 0·085 milligramme of albuminoid ammonia.

It is known that one kilogramme of average London water, such as is supplied by the Thames water companies, gives 0·01 milligramme of free ammonia, and 0·08 milligramme of albuminoid ammonia.

The range of variation in atmospheric air when it has been polluted is much like the range exhibited by polluted water. Thus the analysis of air from a "midden" showed—

In one kilogramme of air,
0·26 milligramme of free ammonia;
0·32 milligramme of albuminoid ammonia.

Chemists who are in the habit of using the ammonia process will recognize these numbers as being such as are given by bad well-water.

In conclusion, and to complete the parallel, the remark may be made that the daily amount of water drunk by the human subject and the daily amount (by weight) of air passed through the lungs are commensurable quantities.

CULTURE AND DISEASES OF THE SILKWORM.

Pasteur has recently investigated some of the diseases which attack the silkworm, and has published the results of his labours in a work entitled 'Sur la Maladie des Vers à Soie.' The disease, called pébrine, which has been very prevalent and destructive of late years in various parts of France, has especially engaged his attention.

Pébrine derives its name from the black specks which occur on the silkworm suffering from it, and it consists in the development of peculiar parasitic corpuscles which invade the eggs, the blood, and all the tissues of the silkworm. One of the observations of M. Pasteur is, that the corpuscles are very easy of detection in the moth of the silkworm, whilst in the earlier stages of silkworm development, *i. e.* in the stage of the egg and of the worm, the detection of the pébrine corpuscles is difficult and often impossible.

Moths, which are recognized as sound, produce sound eggs, whilst unsound moths produce unsound eggs, which, although themselves showing no sign of the disease, cannot develope into healthy worms.

Pasteur's practical advice to the silk cultivator was to examine the moth, and to make sure that healthy moths were started from. The mode of procedure in vogue before Pasteur's investigation of the subject was to examine the eggs. Pasteur remarks, that the culture of the silkworm ought to become a profitable industry in many of the colonies of Great Britain.

MUSCARIN, THE ALKALOID OF THE FLY FUNGUS.

From Wittstein's 'Vierteljahresschrift,' bd. xix. heft 2 (1870), it appears that Koppe and Schmiedeberg have extracted an alkaloid from the fly fungus (*Amanita muscaria*), and have given to it the name Muscarin. The process of preparation is very complicated and tedious, including the pressing out of the juice of the fungus, subsequent concentration by evaporation, and precipitation by means of alcohol. The alcoholic solution is evaporated, and then purified by means of sugar of lead and ammonia, which remove some insoluble matter from it; it is then dried up with powdered glass. From the dry mass a tincture in absolute alcohol is made. The evaporation and precipitation by means of ammonia and acetate of lead is repeated. The lead is subsequently removed by means of dilute sulphuric acid. To the sulphate of the new alkaloid there is added the double iodide of potassium and mercury, which throws down a precipitate containing the alkaloid in question. From this precipitate it is to be extracted by means of baryta water, etc.

Muscarin forms a crystalline mass, which is very deliquescent, fusing to a syrup on exposure to the air. It is tasteless and odourless; reacts strongly alkaline; is insoluble in ether, little soluble in chloroform, very soluble in alcohol and ether. When exposed to the action of heat, it first becomes brownish (at 80° C.), and at 100° C. is a solid, but fuses at higher temperatures; strongly heated, it evolves a smell of tobacco and burns. It is not alterable by boiling with weak solution of potash or dilute sulphuric acid. Heated with solid potash, it evolves a smell of fish, and, on further treatment, disengages abundance of ammonia.

It is a powerful base, precipitating oxides of iron and of copper from their solutions in acids. With carbonic acid, it yields a tolerably stable carbonate, and, with sulphuric acid, it gives crystalline salt, which is deliquescent.

Tannic acid precipitates it only from concentrated solutions; picric acid, chloride of platinum, and ferrocyanide of potassium give no precipitate.

The toxic effects of muscarin resemble those of the Calabar bean.

ACCIDENT DURING THE RECTIFICATION OF ETHER.

An accident, which it is difficult to account for, is described in one of the French journals, 'Répertoire de Pharmacie,' as having occurred to a chemist, M. Adrian, while engaged in the distillation of ether. The assistant who had charge of the apparatus having left the laboratory for a short time, M. Adrian observed that the ether was coming over too rapidly, and proceeded to reduce the jet of steam by which the retort was heated. While he had his hand on the steam-cock for that purpose, he saw a flame in the middle of the laboratory, on the floor, travelling towards the receiver attached to the condenser. In an instant the liquid in the receiver caught fire, the vessel broke, and some of the burning liquid was projected over M. Adrian, finally setting his clothes on fire. He suffered severe injuries from the accident, and had great difficulty in escaping with his life. The most remarkable part of the case is this, that the process was being performed by the use of steam as the source of heat, in a room from which fire was strictly excluded. Whence came the flame which was first seen in the middle of the laboratory, travelling towards the liquid, which it ignited? No doubt the vapour formed a train along the floor, and it is possible that this extended to another apartment, where it took fire.

ON COCA.

BY E. H. FOURNIER.

One of the most remarkable phenomena which claim the attention of the physiologist is the action of stimulants on the human organism. It is a well-ascertained fact that they are capable of supporting the organism in the absence of food; and, whatever the inclinations of individuals may have been, or still are, with regard to their use, it is certain that nations of the past and present cannot, or, at any rate, do not exist without them. Von Bibra, in his preface to 'Die Narkotischen Genuss-Mittel und der Mensch,' assumes the following:—"Coffee leaves, in the form of infusions, are taken by 2,000,000 of human beings; Paraguay tea is consumed by 10,000,000; coca by as many; betel is chewed by 100,000,000; chicory, either pure or mixed with coffee, by 40,000,000; cacao, either as chocolate or in some other form, by 50,000,000; 300,000,000 eat or smoke haschish; 400,000,000 use opium; Chinese tea is drunk by 500,000,000; coffee by 100,000,000. All known peoples of the earth are addicted to the use of tobacco, chiefly in the form of smoking, otherwise by snuffing or chewing." He adds that, with the exception of cacao, perhaps none of these substances has any direct nutritive power. In corroboration of the above figures, stand the reports concerning production, consumption, and taxation of these articles, from which a fair inference can be easily drawn by anybody doubting Von Bibra's accuracy.

In the present article the action of coca will be considered, as described by various travellers in South America. The substance itself is little known in Europe, but it has received considerable attention lately, and a proposal has been made, or at least hinted at, by Dr. Abl, of Zara, to introduce it here. He says,—"Coca, in the hands of cautious captains, will very probably put a stop to the much more disgusting habit of chewing tobacco, and would certainly diminish the number of those who, after shipwreck, perish from want of food." The descriptions given by Pöppig and Weddell* are not likely to stimulate the desire for the importation of the Peruvian herb. They describe the *coquero* as a sickly, tottering being, with hollow eyes, pale lips and gums, black marks at the corners of the mouth, and greenish and stumpy teeth,—a somewhat hideous counterpart to the inveterate drunkard of our own regions. Von Tschudi† mentions a case of a somewhat different character. He says, "A cholo of Huari, named Hatun Huamang, was employed by me in very laborious digging. During the whole time he was in my service, viz. five days and nights, he never tasted any food, and took only two hours' sleep nightly; but, at intervals of two and a half or three hours, he regularly masticated about half an ounce of coca leaves, and he kept an acullico continually in his mouth. I was constantly beside him, and therefore had the opportunity of closely observing him. The work for which I engaged him being finished, he accompanied me on a twelve days' journey of twenty-three leagues across the level heights. Though on foot, he kept up with the pace of my mule, and halted only for the chacchar. On leaving me, he declared that he would willingly engage himself again for the same amount of work, and that he would go through it without food, if I would but allow him a sufficient supply of coca. The village priest assured me that this man was sixty-two years of age, and that he had never known him to be ill in all his life."

* 'Voyage dans le Nord de la Boline.'

† 'Peru. Reiseskizzen.' Translated by Ross.

The *Erythroxylon Coca* is a shrub about six feet high, with bright green leaves and white blossoms. The latter are succeeded by small scarlet berries; the former are described as shaped similarly to the leaf of the cherry-tree. In the tables accompanying Von Bibra's work, some specimens are shown in nature-print (*Naturselbstdruck*). They appear to be considerably smaller than cherry leaves, although in shape not unlike them. The coca is raised for the seed, in garden beds, called almazigas. It requires humidity; therefore maize is sown between the *matas*, or young shoots, to screen them from the too great influence of the sun. When the leaves are ripe—that is to say, when, on being bent, they crack or break off—the gathering commences, and they are stripped from the branches, a task usually performed by women. The plant, thus rendered leafless, is soon again overgrown with verdant foliage. The colour of the leaves when dried is a pale green. The drying demands great care and attention, for, if they imbibe damp, they become dark, and then a lower price is obtained than when they are green. Coca is not believed to improve by keeping; the inhabitants find it unpalatable at a year old. Von Bibra estimates the yield of one acre (German) at 800 lb. of dried leaves; and he calculates that 30,000,000 lb. are annually produced.

The Indians masticate the coca generally in combination with some alkaline substance, which they carry in a small flask gourd, called the *ishcupuru*; a pouch, called the *huallqui*, or the *chuspa*, contains a supply of coca leaves. Unslacked lime pulverized is usually taken with the herb. In Cerro de Pasco, and in places still further south, the Indians use, instead of this, a preparation of the pungent ashes of the quinine. This preparation is called "llucta" or "llipta."

The flavour of coca is said to be rather pleasant. It is slightly bitter, aromatic, and similar to the worst kind of green tea. When mixed with the ashes of the musa root, as in some of the Montana regions, it is somewhat piquant, and more pleasant to European palates than it is without that addition.

In Dr. Mantegazza's prize essay* the whole subject is carefully reviewed and ably treated. Abstracts thereof are contained in the leading pharmaceutical journals. From experiments made repeatedly on himself and on other individuals, Dr. Mantegazza draws the following conclusions:—1. The leaves of the coca, chewed or taken in a weak infusion, have a stimulating effect upon the nerves and stomach, and thereby facilitate digestion very much. 2. In a small dose, coca increases the animal heat, and augments the frequency of the pulse, and consequently of respiration. 3. In a medium dose (three to four drachms) it excites the nervous system in such a manner that the movements of the muscles are made with greater ease, after which it produces a calming effect. 4. Used in a large dose, it causes delirium, hallucinations, and, finally, congestion of the brain.

An inveterate coquero, or coca-chewer, says Von Tschudi, is known at the first glance. His unsteady gait, his yellow-coloured skin, his dim and sunken eyes encircled by a purple ring, his quivering lips, and his general apathy, all bear evidence of the baneful effects of the coca juice when taken in excess. Such an individual is treated as the opium-eater is treated in Java and the East in general. Intemperance is an evil which springs from the love of self-indulgence; and the means for its gratification are, in some form or other, everywhere to be found.

Von Bibra looks upon the chewing Indian as upon an adder, quick to the touch, and resenting with demoniacal hatred an interruption of his feast and his dreams.

* Pamphlet, Milan, 1859. See 'Oesterreichische Zeitschrift für praktische Heilkunde,' Nov. 4, 1859.

Intoxicated sometimes for several weeks, the debauchee hides in the deepest forest. There, stretched upon the ground, he indulges, unmindful of flood, storm, or wild beast, fascinated by, as Bibra has it, one of his components. "Whoso," he says, "has experimented upon himself with narcotics, knows how long one is able to take stock of one's state while under their influence. It seems as if there were two individuals present, the one experiencing all the effect of stupefaction, the other conscious of that state in the one."

Dr. Weddell asserts that the Indians who accompanied him chewed coca all day long, and sat down to their suppers with a double appetite. He believes that the moderate use of coca enables a man to overcome the feeling of hunger for a longer period. The exalting effect which it produces calls out the power of the organism without leaving afterwards any sign of debility. This is proved by experiments, and a number of cases treated by Dr. Mantegazza. The Inca, who lives at a height of from 7,000 to 15,000 feet above the level of the sea, and whose meagre fare consists principally of maize, some dried meat, and potatoes of bad quality, believes that he can sustain his strength solely by the use of coca. The porter who carries the mail, and accompanies the traveller over the roughest roads at the quick pace of the mule, invigorates and strengthens himself by chewing coca. The Indian, who works half-naked in the silver and quicksilver mines, looks upon this plant as ambrosia capable of imparting new life, and of stimulating to new exertions.

Tschudi says, "It is a well-known fact, confirmed by observation and experience, that the Indians, who regularly masticate coca, require but little food, and, nevertheless, go through excessive labour with apparent ease. They therefore ascribe the most extraordinary qualities to the coca, and even believe that it might be made entirely a substitute for food." Setting aside all extravagant and visionary notions, the moderate use of coca is not merely innoxious, but it may even be very conducive to health. There are numerous examples of longevity among Indians who, almost from the age of boyhood, have been in the habit of masticating coca three times a day, and who, in the course of their lives, have consumed no less than 2700 lb., yet, nevertheless, enjoy perfect health. There are cases of individuals in Peru, by no means singular, who have actually attained the age of 130. Supposing these Indians to have begun to masticate coca at ten years old, and calculating their daily consumption as a minimum at 1 oz., the result is the consumption of 27 cwt. in 120 years.

In experimenting upon himself, Dr. Mantegazza states that an infusion of coca will increase the action of the heart to four times its normal standard; while cocoa, tea, coffee, and warm water only double it. By taking an infusion prepared from 3 dr. of the leaves, a feverish condition was produced, with increased heat of the skin, palpitation of the heart, flashes, headache, and vertigo; while the pulse rose from 70 to 134. A peculiar, roaring noise in the ear, a desire to run about, and an apparent enlargement of the intellectual horizon, indicated that the specific influence upon the brain had commenced. A peculiar, hardly describable feeling of increased strength, agility, and impulse to exertion follows; it is the first symptom of the intoxication, which is, however, quite different from the exaltation produced by alcoholics. While the latter manifests itself by increased but irregular action on the muscles, the individual intoxicated by coca feels but a gradually augmented vigour, and a desire to spend his newly-acquired strength in active labour. After some time, the intellectual sphere participates in this general exaltation, while the sensibility seems to be hardly influenced; the effect is thus quite different from that produced by coffee, and resembles in some degree that of opium. Dr. Mantegazza could, in this excited condition, write with ease and regularity. After he had taken 4 dr., he was seized with the peculiar feeling of being isolated from the external world; and, with an irresistible inclination to gymnastic exercise, he jumped upon the writing-table, moving about with ease, without breaking the lamp or other objects upon it. In his normal condition, the learned doctor is by no means given to gymnastic exercise. After this, a state of torpidity came on, accompanied by a feeling of intense comfort—consciousness being all the time perfectly clear—and by an instinctive wish not to move a limb during the whole day, not even a finger. During this sensation sleep sets in, attended by odd and rapidly-changing dreams. It may last a whole day without leaving a debility or indisposition of any kind. Dr. Mantegazza increased the dose to 18 dr. in one day; his pulse rose in consequence of it to 134. Three hours of sleep sufficed to set him right again, so that he was able to follow his daily occupation without the least indisposition, on the contrary, even with unusual facility. He had abstained for forty hours from food of any kind, and the meals then taken were very well digested. During the last stage of intoxication, and in the moment when the delirium was most intense, he described his feelings to several of his colleagues, who were watching him, as being most exquisite, ten years with coca being preferable to a million of centuries without. The description was given in writing by Dr. Mantegazza, thus:—"*Io preferiscata una vita di 10 anni con coca che un di 1,000,000 secoli senza coca.*"—*From the 'Food Journal.'*

NAVY DISPENSERS.

Admiralty, W.C., 7th July, 1870.

Sir,—I herewith transmit for the information of the Pharmaceutical Society twenty copies of the new regulations for the appointment of dispensers and assistant-dispensers in her Majesty's naval hospitals, and I have to request you will be good enough to give publicity to the same.

I am, Sir, your obedient servant,
(Signed) A. Armstrong, *Director-General.*

Elias Bremridge, Esq.,
Secretary and Registrar,
Pharmaceutical Society,
17, *Bloomsbury Square, W.C.*

Admiralty, 24th June, 1870.

Regulations relative to the Appointment of Dispensers and Assistant-Dispensers in Her Majesty's Naval Hospitals at Home and Abroad.

The Lords Commissioners of the Admiralty are pleased to direct that the following regulations relative to the qualifications of Candidates, and the pay and allowances of Dispensers and Assistant-Dispensers of her Majesty's Naval Hospitals at home and abroad, shall in future be adopted:—

1. That a Candidate for entry as Assistant-Dispenser shall make a written application to that effect, addressed to the Secretary of the Admiralty.

2. As vacancies occur, Candidates will be ordered to attend at the Office of the Director-General of the Medical Department of the Navy, observing that no person can be admitted as an Assistant-Dispenser unless he possesses the Minor qualifications of the Pharmaceutical Society; but Dispensers or Assistant-Dispensers in charge of stores must possess the Major qualifications of the Pharmaceutical Society.

3. The age of Assistant-Dispensers on entry not to be less than 20 years, or more than 25.

4. The daily pay of Assistant-Dispensers will be as follows:—

Under 5 years' service.	Under 8 years' service.	Under 11 years' service.	Under 14 years' service.	Under 17 years' service.	Under 20 years' service.
5*s*.	5*s*. 6*d*.	6*s*.	6*s*. 6*d*.	7*s*. 6*d*.	8*s*. 6*d*.

and for every additional year an addition of 6*d*. per diem, till 10*s*. a day is reached.

5. When in charge of stores an additional allowance will be granted, viz. at Haslar and Plymouth Hospitals 2*s*. per day, with the title of Dispenser; and at other Home and all Foreign Hospitals 1*s*. per day.

6. An allowance of 6*d*. per day, in lieu of fuel and lights, will be granted to all Dispensers and Assistant-Dispensers, and they will be provided with quarters.

7. Superannuation will be allowed in accordance with the Superannuation Act of 1859, and a Certificate of Qualification will be required from the Civil Service Commissioners, under the terms of the Order in Council of 4th June, 1870, published in the 'London Gazette' of the 7th June, 1870.

8. Assistant-Dispensers will be liable to serve in any of her Majesty's Naval Hospitals at home or abroad, to which they may from time to time be appointed.

By command of their Lordships,

Vernon Lushington.

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

The following paper contains an account of some investigations that I have made on the chemical reactions and combinations of carbonic anhydride, ammonia, and water with each other. The properties and relations of such bodies as these being of primary importance in the theory of chemistry, they have indeed already received a large share of the attention of chemists; and therefore, besides much that has come to be known concerning them, of which it would be impossible now to ascertain the discoverers, several valuable memoirs have been written upon them. Nevertheless, I think it will be generally admitted that the combinations of these bodies are still felt not to conform in a clear manner to the ammonium theory, the theory of the general constitution of salts, and even the theory of combining proportions.

In attempting to arrive at a more satisfactory knowledge of these combinations, I have made out much that I believe will be found to be new, both to chemical literature and the traditions of the laboratory, and of service in helping to decide as to the normal character of these combinations.

General History.—The first contribution to a knowledge of the chemistry of the carbonated compounds of ammonia must be considered to be that of Black* in 1756, pointing out the difference between solution of ammonia and the solid carbonate of commerce. After this we find Priestley making out the difference between ammonia and its carbonate in his 'Experiments and Observations relating to Alkaline Air' in 1774.†

The first recorded quantitative analysis of a compound of carbonic anhydride and ammonia, as far as I can discover, is that by Bergmann, in 1774.‡

The variable composition of the compounds of carbonic anhydride and ammonia was pointed out in 1799 by Sir Humphry Davy,* but the results he obtained proving to be erroneous, his statements were untrustworthy. The fact of the existence of different carbonates was afterwards confirmed by Berthollet, Dalton, and others.

The Ammonium Carbonates.—I. Normal Ammonium Carbonate.

There are certainly three combinations of ammonia and carbonic anhydride, into the formation of which water enters in sufficient relative quantity to allow of their being represented as ammonium salts of carbonic acid,—the normal, the half-acid, and the acid carbonate.

Since writing the note on the preparation and composition of the first-named of these in the 'Philosophical Magazine,' I have ascertained several interesting particulars in the chemical conduct of this substance, so that the facts there communicated form only a small part of the history of this salt I am now able to give.

History.—The want of the normal carbonate of ammonium was only felt after Berzelius had promulgated his ammonium theory; until then the carbonate, $CO_2(NH_3)_2$, had been considered to be this body.

Berthollet,† in 1806, by distilling a solution of the acid carbonate, obtained a weak solution of normal carbonate ("subcarbonate") as the distillate. But Dalton was the first to describe a solid carbonate, neutral in composition, in 1813.‡ He ascertained that the carbonate of commerce did not contain two atoms of ammonia to one of carbonic anhydride, and prepared a hydrated compound of these bodies in this proportion.§

This compound contained, according to him, one atom of water, and would therefore be represented by the formula,

$$CO_2OH_2(NH_3)_2.$$

The percentage number which he gives for the ammonia is indeed very incorrect in itself; but then he determined it by using standard solution of sulphuric acid, and, as we all know, the equivalent number he adopted for ammonia is wide of the true one. But then he clearly established that in the acid carbonate the acid is only *half* saturated with ammonia, and that in the normal carbonate discovered by him the acid is *fully* saturated. He was, however, also wrong in representing the normal salt to contain, like the acid salt, but one atom of water to one atom of carbonic anhydride instead of two, as his analytical results really indicated. The following is his statement of the composition of the two salts:—

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* 'Experiments on Magnesia, Quicklime, and other Alkaline Substances;' Edinburgh (1777), pp. 65, 86, 103, and 109.

† 'Experiments and Observations on different Kinds of Air,' vol. i. p. 163.

‡ Works, translated by Cullen, vol. i. p. 29. Of the "Aerial Acid," paper read in 1774.

* Works, vol. iii. p. 47.

† 'Journal de Physique,' vol. lxiv. p. 168. Troisième suite des Recherches sur les Lois de l'Affinité. Extracted from the 'Mémoires de l'Institut de France' for 1806.

‡ 'Experiments and Observations on the Combinations of Carbonic Acid and Ammonia.' Mem. of the Lit. and Phil. Soc. of Manchester (2), vol. iii. p. 18; 1819.

§ So far as I can ascertain he has never received credit for this, or for the real excellence of his paper, in spite of the errors it contains. Indeed Henry, in his 'Life of Dalton' (Cavendish Society's Publications), speaks very disparagingly of this paper. The circumstances that seem to me to have contributed to this result are:—(1.) The paper was published five years after it was read, in a journal which probably had a very limited Continental circulation. (2.) The calculations of the results of his analysis are erroneous, in consequence of the atomic weight—6—he adopted for ammonia. (3.) It contains some decided errors, among which, unfortunately, is that of denying the correctness of Gay-Lussac's researches on the proportion by volume in which ammonia combines with carbonic anhydride. (4.) It was severely criticized by Thomson, in his 'Annals of Philosophy' (vol. xv. p. 137), who, nevertheless, besides erring himself in his correction of Dalton's remarks on Gay-Lussac's researches, also misstates another conclusion at which Dalton had arrived.

	Acid carbonate ('carbonate').	Carbonate ('subcarbonate').
Carbonic Anhydride . .	58	41
Ammonia	18	25+
Water	24	34
	100	100

These results show that the normal salt he examined contained two atoms of water to one of carbonic anhydride. For by accepting the percentage numbers he gives for the acid carbonate, and calculating from these the numbers for the normal salt with two atoms of water, we get just those which he gives. Thus:—

Carb. A.		Am.				Carb. A.		Am.
58	:	18	×	2	::	41	:	25·4.
		Water.						Water.
58	:	24	×	2	::	41	:	33·9.

Or putting it in another way: if we apply to his numbers for the normal carbonate the correction we know to be necessary for those he found for the acid carbonate, we get almost exactly the numbers expressing the composition of the normal carbonate with two atoms of water. The calculated numbers are—

	Acid carbonate.	Norm. carb. with $2\,OH_2$.
Carbonic anhydride .	55·70	38·60
Ammonia	21·52	29·82
Water	22·78	31·58
	100·00	100·00

He prepared the normal carbonate in two ways, of which one was by distilling the commercial carbonate, and collecting the first product of the distillation before it had been exposed to the air; and the other, by adding to a warm saturated solution of the commercial carbonate sufficient ammonia to raise the proportion to the proper degree, when, on cooling, the normal carbonate was copiously precipitated.

Sir Humphry Davy obtained, in 1799, a salt that seemed to be, according to him, the most ammoniacal carbonate, and by the first of the methods afterwards employed by Dalton, but he did not determine its composition.

Dr. Thomson, in the seventh edition of his 'System of Chemistry'* (1831), stated that a normal carbonate $CO_2O\,H_2(NH_3)_2$, could be formed by mixing together one volume of carbonic anhydride, two volumes of ammonia, and one volume of water-vapour. It is very doubtful, however, whether the product thus obtained is a single substance, as will be seen by the later part of the present paper.

In 1834 John Davy† repeated his brother's experiments, apparently ignorant of what in the meantime Dalton had done, and ascertained the substance obtained by Sir Humphry to be a hydrated compound of two atoms of ammonia to one of carbonic anhydride. He also confirmed the above statement of Thomson.

Hünefeld, in 1836,‡ obtained a neutral combination of ammonia and carbonic anhydride by distilling the commercial carbonate with aqueous alcohol, but he did not determine its state of hydration.

Next, in 1839, Heinrich Rose§ also examined the most remote part of the first product of the slow distillation of the commercial carbonate, and found it to contain two atoms of ammonia to one of carbonic anhydride; but, according to him, there was associated with these only half an atom of water, so that it was not a true ammonium carbonate, its formula being—

$$(CO_2)_2O\,H_2(NH_3)_4.$$

He obtained the same compound also by distilling a mixture of sal-ammoniac and sodium carbonate.

Lastly, in opposition to the general statement to the contrary, I myself announced in a paper in the 'Philosophical Magazine' for 1868* that a normal ammonium carbonate having the formula

$$CO_2(O\,H_2)_2(NH_3)_2$$

could readily be obtained.

I have already mentioned that Berthollet obtained a solution of normal carbonate at an early date. Then, the year before Rose's paper appeared, Scanlan† pointed out that the action of water upon more of the commercial salt than it can dissolve furnishes a solution containing the ammonia in much greater proportion to the carbonic anhydride than is in the commercial salt. Dalton, however, claimed to have anticipated Scanlan in this observation, and the latter admitted the justice of the claim. Rose, in his paper the year after, showed that this solution was one of the normal carbonate, with only a little acid carbonate, and gave two other methods for obtaining a solution of normal salt. One is to boil a solution of the commercial carbonate; the other is to heat the commercial carbonate very gently in a retort, having its beak dipping under mercury, continuing the heat until a great part of the carbonate has volatilized and the rest become wholly liquefied, then setting aside the liquid in a closed vessel to crystallize (which it continues to do for some days), and then decanting the mother-liquor, which is a solution of normal carbonate free from acid carbonate. That a solution of the normal salt can be obtained by distilling sal-ammoniac, pearlash, and dilute spirit together, was known to Phillips, and perhaps others before him.

Lastly, normal ammonium carbonate, in combination with magnesium carbonate as a crystalline double salt, was prepared by Fourcroy many years ago, and afterwards by Bucholz.‡

(*To be continued.*)

* Vol. ii. p. 384.

† 'Some Experiments and Observations on the Combinations of Carbonic Acid and Ammonia.' Edin. New Philos. Journ. vol. xvi. p. 245.

‡ Journ. für prakt. Chemie, vol. vii. p. 25.

§ Pogg. Ann. vol. xlvi. p. 373. "Ueber die Verbindungen des Ammoniaks mit der Kohlensäure." Also Taylor's 'Scientific Memoirs,' vol. ii. p. 98.

* Fourth series, vol. xxxvi. p. 125.

† 'Reports of the British Association for 1838.' Transactions of the Sections, p. 63.

‡ Bucholz's 'Gren's Grundriss der Chemie,' part i. p. 275, 1809

THE PRESENT PROSPECTS OF THE SEWAGE QUESTION IN RELATION TO THE PUBLIC HEALTH.

BY HENRY LETHEBY, ESQ., M.B.

(*Read before the Metropolitan Association of Medical Officers of Health, May* 21, 1870.)

(*Continued from p.* 25.)

When sewage has a very offensive odour, and is evolving marsh gas and sulphuretted hydrogen, it rarely exhibits much sign of animal life, but when it is diluted with water and exposed freely to the air, the bad odour quickly disappears, and the higher forms of infusoria are rapidly developed. This is proof of the salutary influence of air and water in promoting the less hurtful kinds of decay. I have often noticed that where the sedimentary matters of sewage accumulate and putrefy, without free access of air, foul gases are evolved, and little or no organic life, except of the very lowest kind, appears. This was formerly the case with the mud upon the banks of the Thames, where the only living things were *monads*, *vibriones*, and *fungi;* but in the middle of the stream, where there was abundance of air and water, the highest forms of infusoria abounded. This may be noticed in every river of the kingdom which receives the sewage of a large town. At first, the sedimentary matters deposit and putrefy; but the supernatant water, containing all the soluble constituents of the sewage, passes on, and rapidly becomes clearer and clearer, until its organic matter is appropriated by living beings, or destroyed by oxidation. This process is not only indicated by the marked improvement in the appearance and odour of the water, but it is actually demonstrated by the character of the vegetation, which passes successively from the simplest and lowest forms of fungi to *conferva*, *calothrix nivea*, *vaucheria*, etc., until at last *anacharis*, *nasturtium*, *veronica*, etc. abound; and when these are clean and healthy we may be assured that the sewage, in its noxious condition, is no longer in existence, and that the most refined skill of the chemist will fail to discover it.

I have, on a former occasion, fully discussed this important question, and I should not again refer to it if it had not been made a special subject of comment, and apparently* of experimental inquiry, by the Rivers Pollution Commission; for at page 18 of their recent report they say, "It has often been stated, but so far as we know without proof, that the organic matter contained in sewage, and other similar polluting materials, is rapidly oxidized, during the flow of a river into which such materials are discharged. Thus, it has been asserted (Report of Royal Commission on Water Supply, p. 79) that if sewage be mixed with twenty times its volume of river water, the organic matter which it contains will be oxidized, and completely disappear whilst the river is flowing 'a dozen miles or so!'" Now, I think it is right to state that the quotation is not fairly made, and that the sense and substance of my evidence herein alluded to are not fully expressed; for on referring to the page from which the Rivers Pollution Commissioners have quoted, it will be found that I spoke of oxidation as only one of the agencies concerned in the destruction of organic matter in a running stream. My words are these: "Considering the powerfully oxidizing influence of water upon sewage, the many agencies which are at work destroying it, the power of precipitation, the using of it up by vegetable and aquatic plants, and by fish, and above all by the power of oxidation, I think none of the sewage discharged into the Thames can, at the present time, be discovered at Hampton;" and when I am asked how far it would have to flow before it would be broken up into other chemical compounds, I answer thus: "I have made a great number of chemical experiments to determine that. I have examined most of the rivers in England, and this is the conclusion that has been come to, not only in my mind, but in the minds of all the engineers† who have devoted their attention to the subject—that if ordinary sewage, containing, we will say, nearly 100 grs. of solid matter per gallon, such as London sewage, out of which probably something like 14 grs. or 15 grs. are organic, be mixed with twenty times its bulk of the ordinary river water, and flows a dozen miles or so, there is not a particle of that sewage to be discovered by any chemical process."‡ I ought perhaps to have said by any *reliable* chemical process; for I will not answer for the results of such processes as are used by Dr. Frankland for the determination of "organic carbon" and "organic nitrogen," processes that I have already criticized, and which others have declared to be so faulty, that the range of error embraced by them is greater than the range of possible truth. It is curious, however, that even with these processes the Thames at Hampton, according to Dr. Frankland, is purer than the Thames at its source, notwithstanding that it has received the drainage from all the towns on its banks.*

But to return to the subject, the Pollution Commissioners say, "We thought it very undesirable that a subject of such vital importance to our inquiry should any longer rest upon mere opinion, and we have therefore determined to submit it to careful experimental investigation." Their investigations were of two kinds—namely, an examination of the Mersey, the Irwell, and the Darwin, at different parts of their course, choosing the winter time,† when most of the agencies to which I have referred were dormant; and, secondly, by examining air and sewage contained in a bottle. Both of these investigations were of the most unsatisfactory kind; for from what I know of the rivers in question, there is no part of their course so free from the access of impurities as to furnish even remotely the sort of evidence upon which we can rely. The evidence, however, which they do furnish is that, notwithstanding a continued access of impurity, there is a continued improvement of their condition; and as for the experiments with sewage in a bottle, they are so absurdly ridiculous, as a means of testing so important a question, that I am ashamed to refer to them. The proper way in which such an inquiry should be conducted is an appeal to the large facts of nature; for everywhere the rivers of England are receiving the sewage of towns, and yet they are everywhere undergoing a rapid self-purification. If this were not so, their condition would be frightful,‡ and we should expect a universal pestilence. In this metropolis, for example, the water which we drink is taken from the Thames after it has received the sewage of thousands of people, and yet, to use the words of Dr. Frankland, "it is purer and better adapted for domestic purposes at Hampton," where it is taken, "than at any other part of its course.§ And how has this been effected but by oxidation, and by the operations of animal and vegetable life? When Dr. Miller was asked by the Royal Commissioners on Water Supply, whether he had made any experiments on the power of water, in a given course, to oxidize organic matter, he said, "I ascertained a remarkable result in 1859 upon the river: I took specimens of the water at Kingston, at Hammersmith, at Somerset House, at Greenwich, at Woolwich, and at Erith on the same day, and examined the quantity of oxygen which the water contained at all these different points. I found that the quantity of oxygen at Kingston was the ordinary or normal proportion; at Somerset House it was much diminished, at Greenwich the whole of the oxygen had disappeared, at Woolwich it was in much the same condition, and at Erith the water was very much improved, showing that this diminution of oxygen had been produced by its action upon the water contaminated with

* The Commissioners have given a full account of the experiments and data on which they base their conclusions. (See *Report of Commission on the Pollution of Rivers*, pp. 18–22.)

† Apart from the consideration that this, being a chemical question, cannot be decided by engineers, it has been pointed out by the Royal Commissioners (Report, p. 22) that engineers and superficial observers have been misled as to the self-purifying power of flowing water. They have also pointed out the circumstance which has led to the erroneous impression. Mere clarification of water is no proof that it has been purified sufficiently to be wholesome, and we are not aware that Dr. Letheby has anywhere published chemical evidence to support his views. It is, however, essential that in a matter of such importance this should be done; for no mere assertion, however authoritative will suffice.

‡ Dr. Letheby's influence in regard to sanitary matters is so great, that it is necessary to say the result which he has arrived at is directly at variance with all chemical probability, and with the general opinion of chemists. It is also inconsistent with the direct evidence of facts bearing on the subject.

* Dr. Frankland clearly shows that the water of the Thames is purer near the source of the river, but he says that, *from Lechlade downwards*, it is purer at Hampton than elsewhere.

† The experiments were made between March 10th and June 11th.

‡ The condition of some rivers *is* frightful.

§ Dr. Frankland and Dr. Odling have shown in their Report on Water Supply to the Royal Commission, that the greater purity of the Thames at Hampton is, in great measure, due to admixture of tributary water.

the sewage of the London district, and that, as it passed lower down, the oxygen was again absorbed from the air, and again it became diluted with a large volume of water from below, from other sources—the Lea, the Ravensbeurne, and other tributaries—and in this manner the water had again become oxidized. I look," he says, "upon this as *a direct proof of the effect of oxygen in destroying those organic contaminations which are thrown into the river.*" Dr. Odling, also, in reply to a question from the Royal Commissioners, as to the self-purifying power of water said, "You see in many rivers, even sluggish rivers, having sewage discharged into them, that for a mile or two the appearance of the river is affected by the sewage, but beyond a certain distance there is no recognizable effect at all—the weeds are perfectly clean and perfectly healthy;" and he instances the river Soar, at Leicester, which is black and very foul from the refuse of the town; but "three miles from the town its appearance is such that you could not tell it had been contaminated, for it was running clear, with fish swimming in it, and the weeds were clean." That, he said, was simply from a process of self-purification. Again, Dr. Taylor, of Guy's Hospital, in his examination before a Committee of the House of Commons on the Metropolis Water Supply Bill, states, when speaking of the effect of water on sewage matter, that "all such substances are very rapidly decomposed and destroyed; the nitrogen is converted into nitric acid, and the sulphur into sulphuric acid, so that those fetid and putrid substances which go into the Thames from London, when rolled about by the action of the water, containing an enormous amount of air, *are all oxidized and destroyed; within a certain limit they may be found, but still, after a very short passage, they are very soon indeed destroyed.* I believe," he says, "it is the opinion of every chemist who has considered the subject, that sewage matter does not remain as sewage matter in well-aerated water, but all phosphorus, sulphur, and nitrogen are speedily destroyed by the oxygen of the water. Every 1000 gallons of water contain 46 gallons of oxygen, and that oxygen destroys all such putrescent effluvia. With water not exposed to the air, and not containing air, it is most offensive and unwholesome; but with water containing air, like the Thames, and exposing an enormous surface to the air in its daily motion, the effect is completely to obliterate every trace (of sewage matter) that a chemist can detect. In the Thames, and other water, the air is in a state of solution, the matter in a state of diffusion, and thus the air and this fetid matter are in the very condition to combine together and form an innoxious compound; it requires time and motion, but still it does take place with very extraordinary rapidity." And he concludes his remarks by saying, "The supposition that the drainage of London, which goes into the river about the bridges, remains the drainage of London all up the river, is contrary to all chemical experience; it is contrary to every chemical fact, and every chemical analysis."*

In a former communication to you I spoke of the investigations of Dr. Angus Smith on the polluted water of the Clyde, which were to the same effect. Engineers also, who have been largely concerned in such inquiries, have always spoken of the remarkable self-purifying power of water. Mr. Hawksley, whose experience of this matter renders him a very high authority on the subject, said, in answer to a question from the Rivers Commission, as to the quantity of water, compared with the volume of sewage discharged into it, as necessary for the purpose of breaking up the sewage into inoffensive compounds, that generally 20 to 1 was sufficient; but if the water flows rapidly, and is very much disturbed, so as to be continually receiving fresh oxygen, a smaller quantity—even 12 to 1—will effect the process; and if it proceeds very tardily it may take a little more, but 20 to 1 is abundant. "I could," he adds, "give you very remarkable instances of it. Take Sheffield. Nothing can be fouler probably than the state of the water at Sheffield, whereas if you go down to Doncaster (about twenty miles below Sheffield), the water is supplied by the water-works, and is actually drunk in the town." Again, says Mr. Hawksley, "Take the river Irwell (the very river which Dr. Frankland has been examining). After leaving Manchester it receives the Irk, the Matlock, and all the refuse of the manufacturing population for a great many miles; when it travels down only eight or nine miles to Warrington it is perfectly changed; it ceases, or nearly ceases, in that short distance, to be an offensive river." "At Leicester, likewise," to use his words, "the water was as black as ink—nothing would live in it, and the smell was abominable; but by the time it had got to Loughborough (which is about twelve miles below Leicester) it was entirely restored to its pristine condition. You could stand on the bridge there and see the fish swimming amongst the beautiful reedy and other plants growing in the water, just as in the purest stream. You could see every pebble at the bottom; that is an instance of oxidation." You may remember the instance which I gave you last year of the river Trent, which receives the sewage and manufacturing refuse of some of the largest, busiest, and dirtiest towns in the kingdom, with an aggregate population of more than a million and a half of persons, and yet when it arrives at Nottingham it is not only clear, pellucid, and inoffensive, with abundance of fish and aquatic plants, but is actually used for the domestic supply of the town. But why need I multiply such instances, or dwell upon such self-evident empirical facts, when they are within the common knowledge and experience of everybody? for even Dr. Frankland is ready to admit, in the case of the London water supply, that "by gradual oxidation, partly in the pores of the soil, partly in the Thames and its tributaries, and partly in the reservoirs, filters, and conduits of the company, this sewage contamination had been converted into comparatively innocuous organic compounds before its delivery to consumers."

"I believe," said Dr. Frankland, in his evidence before the Royal Commission on Water Supply, "that the noxious part in sewage is that which is held in mechanical suspension, not that in solution;" and no doubt the sedimentary matters of sewage are capable of producing an offensive condition of the rivers, for when they are discharged into a sluggish stream they quickly subside, and form accumulations of persistently putrefying mud. This is the chief cause of complaint wherever sewage enters a river.

At the time of the inquiry into the state of the Thames, in 1858, it was admitted on all hands that the filthy mud-banks of the river were the great source of annoyance; and Dr. Hofmann and Mr. Witt, in their report of the matter to the Government referees, declared emphatically that the formation of this mud-deposit in the bed of the river appeared to them to be by far the most serious evil which results from the discharge of London sewage into the river, and they strongly urged this point upon public attention. Dr. Odling, in his report to me on this subject, for the information of the referees appointed by the Metropolitan Board of Works, said that "any means which would prevent the deposition of organic mud in the bed, but more particularly on the exposed banks of the river, would effect an amply sufficient purification of it." The same was my own opinion, for in reporting to the referees I stated that the mischief produced by the discharge of sewage into the river "was not occasioned, as I once supposed, by the soluble matters of the sewage, but by the mud or insoluble constituents which settle and putrefy upon the banks of the river." These constituents being in a solid form, and not easily accessible

* The supposition here referred to is an imaginary one, that no chemist would entertain. Whatever change sewage may undergo after its discharge into rivers, there is no evidence to show that it is destroyed so rapidly or to such extent as to be harmless; and that is the real point to be considered.

to atmospheric oxygen, continue to putrefy for a considerable time. In my laboratory operations I have found that they will keep up a persistent decomposition, with a constant evolution of offensive gases, for many months, the air being excluded from them. I am therefore of opinion that the chief point to be aimed at in the purification of sewage is the rapid and effectual separation of its suspended matters, leaving the soluble matter to mix freely with proper proportions of running water, in which it will be quickly appropriated by infusorial life, or be destroyed by atmospheric oxidation; and this leads me to consider the means whereby this may be effected.

One method of accomplishing it is to keep the solid matters out of the sewage, as is practised, with more or less success, in Manchester, Salford, and other towns of Lancashire. In Salford, according to the report of the medical officer of health, Dr. Syson, the most satisfactory results have been obtained with a modification of M. Goux's plan, whereby the soil is received at once into tubs lined with some refuse absorbent; and the advantages of the plan, according to Dr. Syson, are that the manure becomes of great commercial value; that the excrement of the whole town can be readily removed at least once a week; and that in case of fever or contagious diseases the whole of the excrements can be readily and economically disinfected; besides which the plan is simple and economical. Earth-closets are not so manageable, as they require about 3½ times their weight of earth to the excreta, and the difficulties of carrying the material to and from the closets are not manageable on a large scale, although I have seen them in satisfactory operation in factories, as they may be in military camps, where the organization of labour is easy. Instead of earth, Mr. Stanford recommends charred seaweed, which is not only an excellent deodorizer, but does the work of three times its weight of earth. In Edinburgh, in olden times, there were no closets in the poorer houses, but there were numerous public privies, which still exist. These are provided with from eight to forty compartments, beneath which there is placed by the scavengers, every morning, a tin can, like the modern milk-can on the railways, and the can of the previous day, with its contents, is taken away. The soil is mixed with ashes and road-sweepings, and sells for about £7000 a year, which is half the entire charge of the scavenging of the older part of Edinburgh. Nearly everywhere on the Continent some such method is adopted for the collection of the refuse and excreta, and they are profitably utilized. How far an improvement of this condition of things, instead of the present water-closet system, may have met the requirements of hygiene and the demands of agriculture, is an important question. The Pollution Commissioners, however, condemn this plan *in toto;* and so far are their views disturbed by the medium of their prejudices, that they cannot perceive any difference in the quality of the sewage of a place retaining its solid matters, and of another which lets them flow into the public sewers. Liverpool, for example, which collects and disposes annually of about 139,000 tons of privy soil; Manchester, 74,000 tons; Salford, 46,000 tons; Oldham, 50,000 tons; Preston, 30,000 tons; and Bolton, 22,500 tons,—furnish in each case as much sewage, and of the same composition, as the towns which discharge everything into the sewers. The inconsistency of the thing is so striking that it creates most serious doubts of the accuracy of the analyses, and of the reliability of the determinations of organic carbon and organic nitrogen.

And now let us turn to the pet scheme of the Pollution Commissioners—the disposal of sewage in all places and under all circumstances by irrigation. Fortunately for us, the thing has been tried, and is now being done in many places, so that we can test it by its practical results, and examine it by the light of something more than that of abstract speculative chemistry.*

To begin with its absolutely required conditions. You must have a soil that is sufficiently porous to allow the sewage to filter through it, and this soil must be well drained to carry off the subsoil water. The situation of the farm must be convenient as regards the flow of sewage to it by gravitation, and the discharge of water from it by drainage. It must not be within reach of danger from atmospheric miasms, or the pollution of wells by the subsoil drainage. It must have a ready market for the disposal of its only merchantable produce, green Italian rye-grass; and lastly, there must be an area of not less than two acres for every 100 people, one of these acres being in use while the other is resting to recover itself.

These conditions cannot always be secured, but even if they could, let us see if the objections to the process, on sanitary grounds, are not conclusively against it.

1. In the first place, the land irrigated with sewage is always a fetid, swampy morass of the most offensive description. Nowhere, of all the places which I have visited, is there an exception to this condition of things. At the Craigintinny meadows, near Edinburgh, which I have often seen, the stink from them is hardly endurable; —to use the words of Dr. Ligertwood, who was stationed at the neighbouring barracks, "the stench is sometimes quite sickening." At Norwood and at Beddington it is a subject of serious complaint by those who reside in the neighbourhood of the farms. I have myself experienced it on several occasions, and have been surprised at the statements of Dr. Carpenter, of Croydon, whose pet thing it is, that nobody complains of it. Mr. Creasy, the surgeon at the Female Orphan Asylum, at Beddington, tells a different story, for he says it so damages the value of the neighbouring property that villas near the farm do not let so well as others, nor at so high a rent.

At Aldershot, which is frequently referred to as a well and successfully managed sewage farm, I ascertained, on a recent visit with Mr. Hawksley, Mr. Eggar, and Professor Ansted, from the occupants of the few cottages which skirt the farm, that the stench is frequently unbearable and most sickening. At Banbury there is but one house upon the estate; it is a public-house called the Bowling Green, and the landlady described to us, in very graphic terms, the nuisance she was obliged to submit to.

2. But these miasms are not alone offensive, they are also dangerous to the public health; in fact, the early proceedings of those who have brought about this condition of things were devoted almost entirely to the proof of their morbific action, and it was this apparently clear proof which was made the lever of their parliamentary movements, and was the main cause of our present difficulties. Now, however, they will tell you that the emanations from acres of land sodden with putrefying sewage are neither offensive to the senses nor injurious to the health.† I put it to you, gentlemen, as a simple matter of common medical experience, whether you are of such an opinion; for, if so, where is the necessity for all our elaborate and expensive machinery for getting rid of these matters from our houses, and for preventing the escape of such offensive emanations? Why feel, in fact, the least concern for an untrapped drain or an overflowing cesspool? One of the highest medical authorities on the subject of fevers, Dr. Murchison, has traced a particular fever to this particular source, and has devoted a large portion of his classical work to the proof of sewer gases being the primary cause of what he has termed *pythogenic* or enteric fever. It is true that he has some doubts, like Dr. Christison, of the effects of the diluted gases; but time will prove whether these doubts are well

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* The cases where sewage irrigation has been practised can scarcely be regarded otherwise then as cases of getting rid of sewage; its utilization is still a problem to be worked out in all that relates to profit and health.

† It is the concentration of noxious gases by confinement that is hurtful; but in irrigation sewage need not be putrid, moreover it is subject to the disinfecting influence of the soil and atmosphere.

founded. Already enough has been seen to show that they are not so harmless as many suppose. Mr. Creasy, to whom I have before alluded as practising at Beddington, said very recently, before a committee of the House of Commons:—I know the sewage farm belonging to the Croydon Board of Works, at Beddington, and have had experience in my professional capacity of what condition of health is around those flats, for I have known the district ever since it was a sewage farm. The first case of typhoid fever occurred in the place in 1867, and from that time to this there has been typhoid fever in every cottage on the estate; and I find around it that almost every disease assumes a particular type, accompanied with what we call a sewage tongue."

In the spring of last year I was inquiring into the condition of a stream called the Hebble Brook, which receives the sewage of Halifax, and I was informed that at a place near the outfall of the brook into the Calder, some of the sewage was distributed upon the land, and that it caused such a serious outbreak of typhoid fever in a neighbouring model village, belonging to Mr. Ackroyd, that it was found absolutely necessary to discontinue it.

Again, in the autumn of 1862, I had an opportunity of witnessing, on a very large scale, the morbific effects of sewer gases in the town of Shaftesbury, and the adjacent village of Enmore Green. The town had been recently drained by a gentleman of no great practical acquaintance with the subject, and he carried the sewage into the ponds and ditches around the town. It was an experiment of a very instructive kind, for soon the people were attacked with enteric fever, and in less than a year one-eighth of the whole population was down with the disease; for out of about 3500 persons, 448 were attacked. I am afraid, therefore, that these miasms, even when diluted with air, are capable of producing serious mischief, and that such facts are more conclusive than the statistics of Dr. Carpenter, which seem to show that the people of Beddington and Norwood have actually been better in health since the sewage was brought to them than before.

3. I would remind you that the efficacy of sewage irrigation is entirely dependent on the percolation of sewage matter, and the distribution of it through the subsoil water. It cannot but be, therefore, that this water is polluted to such an extent as to endanger the neighbouring wells. Many instances of this have already come under my notice; and it would seem, from the remarks of Dr. Carpenter, that Dr. Frankland had himself stated that the chalk well at Croydon, from which the public supply is obtained, is actually polluted with the soakage of foul matters from the irrigated grounds at Beddington. The morbific effects of such water are but too frequently observed, as the annual reports of the medical officer of the Privy Council abundantly testify; and then, again, if the doctrines of Professor Von Pettenkofer, of Munich, be correct, as they certainly seem to be, that fluctuation in the level of ground water charged with sewage is the most active agent of fever and cholera, the consequences of irrigation may be most serious.

(*To be continued.*)

*** The subject of which this paper treats is important in its general bearings, and so urgently forced upon the consideration of municipal authorities throughout the kingdom, that it has been deemed necessary to add some notes in reference to the opinions and assertions put forward by Dr. Letheby with great decision, and with some aspect of plausibility, though they are far from being regarded as sound or judicious by sanitary authorities either here or abroad. It is probably in any case premature to pronounce so decisively as Dr. Letheby does that sewage irrigation is an unmitigated evil; and, in spite of the positive declarations made by those who act with him, three sewage irrigation bills have passed both Houses of Parliament this session. Those who can distinguish between what is termed "scientific evidence" and that evidence which is recognized in science, will probably fail to share Dr. Letheby's shame, or to participate with him in his appreciation of what he declares "absurdly ridiculous."—ED. PH. J.

CRYSTALLIZED HYDRATE OF SODA.

According to a communication made by O. Hermes to the Chemical Society of Berlin, crystals containing 30·09 per cent. of anhydrous soda (Na_2O), and having the formula $2\,NaHO + 7\,H_2O$, are deposited when a concentrated aqueous solution of caustic soda, sp. gr. 1·365, is exposed to the action of intense cold. The crystals form rhombic prisms, and are perfectly transparent and colourless; they begin to melt at 6° C. A point worthy of being remembered is, that impure solutions of soda, contaminated with chloride, sulphate, and carbonate, are capable of depositing these crystals in a state of tolerable purity.

The occurrence of errors respecting the composition of these hydrated crystals in some of the newest treatises on chemistry induced the author to bring the subject before the Chemical Society of Berlin.

ON THE TIME FOR COLLECTING THE LEAVES OF DIGITALIS.

BY F. SCHNEIDER.

The pharmacopœias and text-books direct to collect these leaves of the flowering plant. I had the leaves annually collected in the Black Forest during the latter part of May or beginning of June, requiring always some flowering stems. In appearance I had a beautiful drug, but rarely could I get a satisfactory reaction by tannin and ferrocyanide of potassium in the infusion. In 1869, a botanical friend, formerly apothecary, offered to supply Digitalis, which he collected near the end of August and beginning of September, as he had done during his long pharmaceutical practice, from the rosulate leaves of plants, flowering the following year. The Digitalis yielded a deeply-coloured infusion of strong odour and taste, and gave with tannin at once a dense precipitate; with ferrocyanide of potassium, after twelve to fifteen minutes, a strong turbidity. The leaves should, therefore, be collected not in the flowering season, but late in summer.—*American Journal of Pharmacy*, from *Schweiz. Wochenschr. f. Ph.*

APPLICATION FOR BALDNESS.

Take of

Rum		500 parts.
Rectified Spirit } Distilled Water }	each	75 ,,
Tincture of Cantharides		3 ,,
Carbonate of Potash		3 ,,
Carbonate of Ammonia		5 ,,

Mix the liquids, then dissolve the salts, and filter. After having saturated the bald part for some minutes with this liquid, wash the head with water.—*Journal de Pharmacie et de Chimie.*

Indelible Ink.—The following receipe is given by Puscher:—Dissolve 4 parts of anilin black in 16 parts by weight of alcohol, with 60 drops strong hydrochloric acid, and dilute the dark blue solution with 90 parts by weight of water, in which 6 parts of gum arabic has been previously dissolved. This ink is said not to act upon steel pens or to suffer any alteration by alkalies or acids.—*Deutsche Industriezeitung.*

Poisoning by Corrosive Acids. — On Monday, June 27th, a man was found in Richmond Park, lying on the ground apparently in great agony. Near him was a small bottle, labelled "spirits of salts." He was conveyed to the infirmary, where he lies in a dangerous state. A few days previously, a man, a plumber and glazier by trade, in a fit of temporary insanity, swallowed a quantity of fluoric acid; he was conveyed to Middlesex Hospital, where he died almost immediately.

The Pharmaceutical Journal.

SATURDAY, JULY 16, 1870.

NAVAL DISPENSERS.

We congratulate the Pharmacists of Great Britain that a step has been taken towards the recognition of the claims of pharmacy by the national Government, as implied by the communication from the Admiralty to the Secretary of the Pharmaceutical Society given in another part of this Journal.

The Admiralty now requires that its dispensers shall know their business, and that department has become alive to the fact that theirs is a business requiring to be learned. Now the dispensers and assistant-dispensers in charge of the Government stores must be educated men; not, as formerly, pensioners with a turn for dispensing, or persons needing to be provided for in some way, but having no kind of natural aptitude for anything.

Quoting from the official communication just referred to, "No person can be admitted as an assistant-dispenser unless he possesses the Minor qualifications of the Pharmaceutical Society; but dispensers or assistant-dispensers in charge of stores must possess the Major qualifications of the Pharmaceutical Society."

When we reflect that the Admiralty is slow to change, and how discipline and necessary subordination (as a kind of makeweight to their acknowledged advantages) entail reticence, and a casting into the shade of such mishaps as the administration of a poison in place of medicine, we shall be prepared to realize the full significance of this last order, transmitted by the Admiralty to the Secretary of our Society.

THE "AGE OF PROGRESS."

In the belief that the calm which proverbially succeeds a storm has now become established, we refrain from inserting a number of letters that have reached us on this subject. The views of all parties have, we think, been adequately expressed, and further correspondence would probably have the effect of supplementing mere difference of opinion with the acrimony arising from controversial disputes.

If the recent Council election be the index of a "period of transition" rather than of an "age of progress," as suggested by one of our correspondents, it would seem to follow that its advantages or disadvantages would be better dealt with as matters of history than as subject for prophecy.

The desire of provincial members to be more largely represented in the governing body of the Society has been attained, and it now remains for them, not only to bear their victory with becoming dignity and forbearance, but also to sustain and justify their claim to a representation in the Council proportionate to their numbers.

On these grounds alone we think it would be advisable to let this matter rest, and we trust this view will be so far appreciated by our correspondents that they will regard it as a sufficient reason for the non-publication of their letters.

ANONYMOUS WRITING.

A number of letters have been received in which the propriety of anonymous correspondence is disputed and maintained. As the provision of a medium of communication is an important function of this Journal, this question deserves serious consideration, and there is much to be said on both sides. Wherever the subject-matter of a letter has a personal bearing, it is desirable that the name of the writer should appear, and in many cases the statement of facts, or even opinions, will gain weight by the signature of a name. At the same time there are cases in which expression of opinion, argument, and criticism, would be restricted by the necessity of publishing a writer's name, and the best safeguard of propriety is to be looked for in that exercise of judgment and regard for principle which are admitted to be characteristic of the English press.

On the Continent, as many of our readers doubtless know, it is customary for every leading article to bear the signature of the writer, and in this country the same practice has been adopted by the 'Fortnightly Review,' to some extent by 'Nature,' and by other publications. It is, however, at least doubtful whether we should or not follow these examples, and conform to Continental usage.

THE NEW LIBRARIAN OF THE LONDON INSTITUTION.

The office of Librarian of the London Institution was once filled by the celebrated Greek scholar, Porson; afterwards it was held by Mr. Thompson, and then by the late Mr. Brayley, who died a short time ago. The choice of the managers of the Institution has now fallen on Mr. J. C. Brough, who has just been elected to the librarianship. Mr. Brough is well known to our readers from his connection with the 'Chemist and Druggist,' of which he was editor until quite recently. The short-lived and much regretted 'Laboratory' was, as many of our readers will also recollect, edited by the same gentleman. Great satisfaction has been expressed with Mr. Brough's election: the managers of the Institution could hardly have hit upon a better man for the office.

ON SULPHOCARBOLIC ACID AND THE SULPHOCARBOLATES.

BY T. OMAR GUY.

These chemical combinations have quite recently come before the medical world as new therapeutical agents, but have not been thoroughly investigated. There having been no satisfactory process given for their manufacture, the subject was presented to me several months ago for investigation; since which time I have experimented with various combinations, and find the following to give the most satisfactory results:—

Sulphocarbolic Acid.—This is first formed by combining, by aid of heat, sulphuric and carbolic acids, in the proportion of 49 parts by weight of the former to 94 parts by weight of the latter, or one equivalent of each.

The mixture is put into a glass flask with a narrow top, into which is inserted a thermometer, and covered over by means of a paper diaphragm, in order to keep the fumes from escaping. It is then placed on a sand-bath, and heat gradually applied, until the acid is raised to the temperature of 290° F., and kept at this point for ten or fifteen minutes, and then allowed to gradually cool.

At first this forms a thick syrupy liquid of a rich wine colour, which, in time, passes into a crystalline mass, composed of small rhomboidal crystals, having a reddish-brown appearance. These again become liquid at or about 80° F.

When the two acids are first mixed, heat is evolved, the temperature being raised to 190° F. Fumes are given off, which are again condensed on the sides of the vessel. These have an odour similar to carbolic acid, though differing in some respects.

Sulphocarbolic acid reddens litmus; with the sesquichloride of iron, also, with the solution of the pernitrate of iron, it produces a beautiful purple colour, which fades when exposed to the sunlight for a short time. With chloride of barium, nitrate of baryta, and the acetate of lead, it produces a slight opalescence, which is probably owing to a little free sulphuric acid.

Its taste is at first strongly acid, leaving a slight empyreumatic taste upon the tongue. It also has a strong empyreumatic odour, resembling, to some extent, carbolic acid. Its sp. gr. is 1·288; boils at 540° F., and is decomposed at 560° F. into a black, shiny, amorphous mass, having lost all of its odour; soluble in water and alcohol, and gives a decided reaction with the soluble barium and lead salts.

The acid is soluble in any proportion of water, alcohol, and ether. It dissolves iodine, and the solution will combine with water without throwing the iodine out of solution.

When heated to 400° F. it becomes of a bright red colour, and when cooled forms an almost semi-solid mass. If nitric acid is added to a portion of sulphocarbolic acid, it is immediately decomposed with violence, nitrophenic acid being formed—a black, oily liquid, giving off a peculiarly disagreeable odour, entirely different from that of carbolic acid.

In forming the sulphocarbolic acid, I used the chemically pure sulphuric acid, sp. gr. 1·823, and Calvert's No. 2 carbolic acid.

The interchange of elements which takes place when sulphocarbolic acid is formed may be represented by the following reactions:—one equivalent of carbolic acid $= C_{12}H_6O_2 = 94$; one equivalent of sulphuric acid $= SO_3HO = 49$; then $C_{12}H_6O_2 + SO_3HO = C_{12}H_6O_2 SO_3HO = C_{12}H_5O, SO_3, 2HO$, which might be considered sulphophenic acid, or a hydrated sulphate of the oxide of phenyl.*

Sulphocarbolic acid has been experimented with in regard to its disinfectant properties, and found to be much more efficient than carbolic acid alone.†

* These formulæ are somewhat doubtful and antiquated.—Ed. Ph. J.

† *Vide* 'Pharmacist,' Chicago, September, 1869.

With salifiable bases it combines and forms salts, which have been called sulphocarbolates. These have a faint odour of carbolic acid, and are supposed to have its therapeutical properties combined with its respective bases, without its causticity, rendering it suitable for internal administration.

In heating the acid great care should be used not to heat it too suddenly. There is apt to form at the bottom of the vessel a black liquid, caused by too great a temperature, resulting in the decomposition of the acid.

Sulphocarbolate of Soda.—This salt is at present considered the most important of the series. It may be produced by taking one volume of sulphocarbolic acid, adding six volumes of water, and completely saturating with carbonate of soda in crystals. The solution is then filtered and evaporated slowly over a sand or water bath until a slight pellicle is formed, when it is set aside to crystallize. When the crystals are all formed, the mother-water may be still further evaporated, and a new crop of crystals obtained.

Should they contain colouring matter, or the crystals not be well-formed, a re-solution and crystallization will produce a beautiful salt, free from colouring matter, and of well-defined rhomboidal prisms, soluble in five parts of cold water at 60° F., and in two-thirds its weight of boiling water; soluble to a slight extent in alcohol, but insoluble in ether.

Sulphocarbolate of soda is a nearly colourless salt, possessing a slight pinkish tinge. It has a somewhat saline, bitterish taste, and a faint odour of carbolic acid; neutral to test paper; produces no precipitate with chloride of barium, nitrate of baryta, or the acetate of lead. With the sesquichloride of iron and the liquor ferri nitratis, it produces a beautiful purple colour, characteristic of the sulphocarbolic acid.

The crystals should be well dried by exposing them to the air in a warm place on filtering or porous paper.

The reactions which take place when the salt is formed may be represented by the following equation:—$NaO, CO_2 + C_{12}H_5O, SO_3 2HO = NaO, C_{12}H_5OSO_3HO + CO_2$.

In heating this salt to a high degree, it loses thirty per cent. of its weight, and falls into a greyish-white powder, giving a white precipitate with chloride of barium, nitrate of baryta, and acetate of lead; with the sesquichloride of iron and the solution of ternitrate of iron, it produces a deep reddish colour. If the heat is continued to redness, it takes fire and burns without flame. Nitric acid, added to a solution of the salt, gradually acquires a reddish-brown colour.

The therapeutical properties of sulphocarbolate of soda have not been thoroughly investigated. It has been used in phthisis with marked success; also in zymotic diseases with favourable results. It has been given in doses ranging from ten to sixty grains.*

Several physicians of this city have used the sulphocarbolate of soda in the treatment of disease. Among the number the following have been reported. One case was that of Anna E——, having suffered from ozena for several years. The sulphocarbolate of soda was used, varying the strength from two to eight grains to the fluid ounce of water. It was used twice daily, with Thudichum's nasary douche, with the most flattering success.

It was also used as a topical application in a case of syphilitic sore-mouth with good results. In this case the strength of the solution used was ʒi to f℥iv of water.†

As a dressing for fetid leg ulcers the solution of the sulphocarbolates possesses one advantage over the carbolic acid; the acid in oil or paste is at first generally too stimulating, but soon volatilizes, leaving the oil or paste inert. The sulphocarbolates being less volatile, but at the same time possessing the antiseptic qualities, a more uniform application is obtained.

* 'London Practitioner,' July, 1869.

† Cases reported by Dr. Collins.

This salt was used in several cases of severe tonsilar ulceration, which all rapidly recovered without the occurrence of suppuration.

It was also employed in several severe cases of scarlet fever, every case of which recovered in a less period of time than under any treatment which had previously been employed in similar cases.*—*American Journal of Pharmacy.*

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL,

July 6th, 1870.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Abraham, Atherton, Bottle, Bourdas, Brady, Brown, Dymond, Evans, Groves, Hanbury, Hills, Mackay, Reynolds, Savage, Stoddart, Sutton, and Woolley.

The minutes of the last meeting were read and confirmed.

The following letter from the Privy Council was read, and ordered to be entered on the Minutes:—

"*Medical Department of the Privy Council Office, June 9th*, 1870.

"Sir,—In answer to your letter of the 3rd instant, submitting, on the part of the Pharmaceutical Society, for the approval of the Lords of Her Majesty's Council the names of certain Pharmaceutical Chemists proposed to be Examiners for the Society for the ensuing year, my Lords direct me to inform you that they approve the appointments submitted to them.

"I am, Sir, your obedient servant,

"JOHN SIMON.

"*The Secretary, Pharmaceutical Society.*"

In consequence of the increasing number of candidates for examination in Scotland, it was considered desirable to extend the Board of Examiners to eight, as provided under the Bye-laws; and the following Pharmaceutical Chemists were thereupon appointed, subject to the approval of the Privy Council:—

Henry C. Baildon .... Princes Street, Edinburgh.
Alexander Noble .... Circus Place, Edinburgh.

Letters were read from—

The Science and Art Department, South Kensington, acknowledging the receipt of the votes of thanks passed at the last meeting of the Council.

Professor Roscoe, expressive of his appreciation of the honour conferred on him in being elected an Honorary Member of the Society.

Mr. Schacht, of Clifton, consenting to deliver the sessional address in October next.

The report of the Finance Committee was presented, showing, on the General Fund Account, a balance in the Treasurer's hands of . . . . £1862. 11*s.* 3*d.*
And submitting for payment accounts, law costs, salaries, etc., amounting to . £1469. 11*s.* 9*d.*

On the Benevolent Fund Account a balance of £458. 12*s.* 1*d.*

The Finance Committee, as requested at the last meeting of the Council, having taken into consideration the funded capital of the Society with a view to its more advantageous investment, further reported,—

"That this Committee is of opinion that the funded capital of the Society might be more advantageously employed if invested in good freehold ground-rents, or freehold landed security; and the Committee recommend that a portion of the capital be so employed at the earliest opportunity."

Moved by Mr. Mackay, seconded by Mr. Brown, and

Resolved—That the Report of the Finance Committee be received, but the Council deem it more prudent to continue the present investment of the funds of the Society in Government Securities.

Resolved—That the Treasurer be requested to pay to the several annuitants (10) their quarter's annuities in advance to Michaelmas next.

The Report of the House Committee Meetings of June 5, 10, and 17, having been read, it was resolved that the Report be received: that the matters recommended relating to office-fittings, house-cleaning, painting, etc., be referred back to the Committee to carry out.

Resolved—That the Report and recommendations of the Library, Museum, and Laboratory Committee be received and adopted.

On the Report and recommendations of the Parliamentary Committee, it was

Resolved—That the list of Local Secretaries for the ensuing year, now presented, be approved, and that the said list be published in the ensuing number of the Journal.

Resolved—That the Registrar be instructed to consult the Society's Solicitors, in reference to proceedings to be taken in certain cases reported by him of infringements of the Pharmacy Acts.

On the Report of the Special Journal Committee, the Council proceeded to the election of an Editor for the 'Pharmaceutical Journal.'

Mr. Watts having withdrawn his application, the remaining candidates were

Dr. Redwood, Dr. B. H. Paul, and Dr. J. Baker Edwards.

Ballot having been taken, the following was the result:—

BENJAMIN H. PAUL, PH.D., F.C.S.	12
THEOPHILUS REDWOOD, PH.D., F.C.S	7
JOHN BAKER EDWARDS, PH.D., F.C.S.	0

Dr. Paul was therefore declared elected Editor.

The election of a Sub-Editor was left to a committee, consisting of the President, Vice-President, Messrs. Dymond, Mackay, and Reynolds, subject to confirmation by the next Council.

Moved by Mr. Abraham, seconded by Mr. Mackay,

That Professor Redwood be re-appointed Professor of Chemistry and Pharmacy at a salary of £400 per annum.

Amendment—Moved by Mr. Brown, seconded by Mr. Woolley,

That Dr. Redwood be re-appointed Professor of Chemistry and Pharmacy at a salary of £300 per annum.

Mr. Brady demanded that the voting should be by ballot.

Ballot—*For* the Amendment, 11. *Against*, 7.

The Amendment, having been put as a substantive Motion, was carried.

Moved by Mr. Hanbury, seconded by Mr. Mackay,

That, in recognition of the long and varied services of Dr. Redwood, an annuity of £100 be in future paid him.

Amendment—Moved by Mr. Brady, seconded by Mr. Brown,

That no notice having been given of the proposed annuity to Dr. Redwood, the consideration of the subject be delayed for a month.

For the Amendment—

Messrs. Atherton, Brady, Brown, Dymond, Reynolds, Savage, Sutton, and Woolley.

* *Vide* 'London Practitioner,' July, 1869.

Against—
Messrs. Abraham, Bottle, Bourdas, Evans, Haselden, Hanbury, Hills, Mackay, Sandford, and Stoddart.

Mr. Groves did not vote.

The Amendment being lost, the original Motion was then put, when another Amendment was moved by Mr. Sutton, seconded by Mr. Atherton,

That Dr. Redwood be allowed £50 per annum.

Mr. Reynolds demanded that the voting should be by ballot.

Ballot—*For* the Amendment, 8. *Against*, 10.

The original Motion was carried.

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

Professor Attfield was reappointed Professor of Practical Chemistry, and Director of the Laboratories, for the ensuing year.

William Augustus Tilden, B.Sc., was reappointed Demonstrator in the Laboratories for the ensuing year.

John Moss was reappointed Assistant-Demonstrator for the ensuing year.

On the consideration of the resolution passed at the last Annual Meeting,

"That this meeting is of opinion the means hitherto adopted by the Society to supply the educational wants of its members are no longer adequate to the necessities of the times; and it respectfully urges upon the new Council the desirability of considering some scheme by which the resources available for such purposes may be more generally distributed,"

It was moved by Mr. Reynolds, seconded by Mr. Hanbury, and

Resolved—That the following be a Committee to inquire into the existing facilities for Pharmaceutical Education in the Provinces, and that they be desired to offer suggestions for the aid and extension thereof:—The President, Vice-President, Messrs. Atherton, Brady, Dymond, Groves, Mackay, Reynolds, Stoddart, Sutton, and Woolley.

The consideration of the resolution on the Sale and Keeping of Poisons, passed at the Annual Meeting, "That the subject be taken into consideration by the incoming Council, and that a further report be made to the next Annual Meeting," was deferred.

A letter was read from Messrs. Churchill and Sons, containing suggestions in reference to the publication of the Journal, etc., and was referred to a Committee.

REPORT OF THE BOARD OF EXAMINERS FOR ENGLAND AND WALES.

June 15,	Major Examination,	5 candidates,	4 passed.
"	Minor "	28 "	19 "
"	Separate "	1 candidate,	1 "
July 1,	Modified "	38 candidates,	19 "
"	Preliminary "	176 "	144 "
		248	187

Preliminary Examination, certificates approved, 4.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Duncan, Joseph .... Glasgow.
Finlay, James .... Edinburgh.
Fryer, Charles .... Guildford.
Furmston, Samuel Chambers .. Wycombe.
Horsley, Thomas Wood ...... Manchester.

Resolved—That the following Pharmaceutical Chemists be and are hereby elected Members of the Society:—

Cadman, Daniel Charles ...... Folkestone.
Duncan, Joseph .... Glasgow.
Goulden, Edward Baker ...... Uckfield.
Meadows, Henry .... Gloucester.
Paffard, Walter Haideen .... Niagara.
Reeler, John William .... Cape Town.
Tuck, William Henry .... Surbiton.
Williams, Richard .... Brixton.

Resolved—That the following Registered Chemists and Druggists be elected Members of the Society:—

Barnitt, Francis .... Bath.
Foster, James Alfred .... Birmingham.
Fowke, Thomas Edward ...... Stafford.
Harvie, George .... Helensburgh.
Hodkinson, John .... Macclesfield.
Longhurst, Edward .... Matlock Bath.
Malden, William Walter .... London.
Stevens, John Ashley .... Trowbridge.
Sykes, Thomas Hindle ...... Southport.
Wright, George .... Burton-on-Trent.

Moved by Mr. Woolley, seconded by Mr. Brown,—

That Elizabeth Leech, Munster House, Fulham, Registered Chemist and Druggist, be elected a member of the Society.

For—
Messrs. Abraham, Bourdas, Hanbury, and Woolley.

Against—
Messrs. Atherton, Brady, Dymond, Groves, Haselden, Hills, Mackay, Reynolds, Sandford, Savage, and Stoddart.

Mr. Evans did not vote.

The motion was therefore lost.

Resolved—That the following, having passed their respective Examinations, be elected

ASSOCIATES IN BUSINESS.

MINOR.

Peake, Henry Felix .... Twickenham Green.

MODIFIED.

Goodwin, Medmer .... Plymouth.
Hackney, William Francis .... London.
Jones, Owen .... Llanrwst.
Morris, Frederick Robert .... Lowestoft.
Waterworth, Alfred .... Preston.

Resolved—That the following, having passed their respective Examinations, be elected

ASSOCIATES OF THE SOCIETY.

MINOR.

Appleby, Calvert .... Retford.
Botterill, George Thomas .... Boston.
Davison, Anthony .... Kidderminster.
Griffin, Thomas .... Bromley.
Hill, William Edward .... Leicester.
Homer, Frederick George .... Birmingham.
Horton, Walter Charles ...... Windsor.
Howie, William Lamond .... Edinburgh.
James, George .... Haverfordwest.
Masson, George .... London.
Osborne, James .... Ashbourne.
Pick, Richard .... Hull.
Powell, Thomas Henry ...... Hornsey Rise.
Vincent, Philip, jun. .... Fulham.
Wallis, Herbert Boyd .... London.
Warren, William .... Chertsey.
While, William John .... Cheltenham.
Wing, Lewis .... Torquay.
Wonfor, Herbert Ison .... Southampton.

MODIFIED.

Burgess, Frederick Augustus .. London.
Floyd, John .... Liverpool.
Gowen, Albert .... Stratford-on-Avon.

Hill, Edward .... Barnstaple.
Turner, John .... Ramsgate.
Matthew, Josiah .... London.

The Secretary presented a list of members who had paid their subscriptions since the 30th April last.

Resolved—That they be severally restored to their former status on payment of the nominal fine of one shilling.

A request having been made by the Sunderland Chemists' Association that the Journal of the Society be supplied to them, it was resolved that the requisition be complied with.

EXAMINATION IN LONDON.

July 13th, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Gale, Garle, Haselden, Ince, and Southall. Dr. Greenhow was also present on behalf of the Privy Council.

Twenty-five candidates presented themselves for examination,—twelve Major and thirteen Minor; the following passed and were duly registered

MAJOR (As PHARMACEUTICAL CHEMISTS).

*Webb, Edward Alfred .... Clapham.
*Bland, Thomas Fredrick ...... Stourbridge.
*Thompson, William Milner .. Thirsk.
*Raffle, William .... South Shields.
Pitts, Phineas Reynolds ...... Hingham.
Walton, Jonathan Sparke .... Haydon Bridge.
Adams, Frank .... Stoke-on-Trent.
Mason, Robert William ...... Rugby.

MINOR (As CHEMISTS AND DRUGGISTS).

*Sherburn, Thomas .... Harrogate.
*Sumner, Benjamin Tindale .... Horncastle.
Clark, Walter Beules .... Leicester.
Page, William Henry .... London.
Storey, Edward Henry ...... London.
Margetts, George William .... Fakenham.
Green, Marryat Hahnemann .. London.
Thomas, Evan Medeni .... Pantyrodyn.

The above names are arranged in order of merit.

* Passed with honours.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

ACIDUM CARBOLICUM. *Carbolic Acid.—Synonyms:* phenic acid; phenic alcohol; hydrate of phenyl; phenol. When coal-tar is distilled, the first portions which come over constitute crude *coal naphtha*, and contain benzol, C_6H_6. The next portion collected in the receiver is *heavy coal oil* (being heavier than water); it boils at 300° F. and upwards, and contains carbolic acid. Later in the process the oil which distils contains a good deal of solid matter (naphthaline, etc.), and the black residue in the retort forms pitch. Carbolic acid is separated from the heavy oils by distilling them fractionally, that is, by collecting the constituents which pass over at different temperatures in different receivers. The details of its successful preparation on the large scale, are only known to a few manufacturers.

It melts at 95° F., and boils at 370° F.; sp. gr. 1·065. Formula HC_6H_5O.

It resembles creasote in many respects, but differs from it in having no action on polarized light, and being easily crystallizable by cooling. An aqueous solution also gives a blue colour with perchloride of iron, which creasote does not. Carbolic acid is an important antiseptic. [§ A slip of deal dipped into it, and afterwards into hydrochloric acid, and then allowed to dry in the air, acquires a greenish-blue colour. It coagulates albumen.] Although called an acid it has no acid reaction upon litmus-paper, and is given off unchanged by heating any of its compounds with bases.

By treating it with nitric acid it gives, according to the strength of the acid and time allowed for reaction—

Mononitrophenic $HC_6H_4(NO_2)O$,
Dinitrophenic . $HC_6H_3(NO_2)_2O$,
Or trinitrophenic $HC_6H_2(NO_2)_3O$ acid.

The last is important as a yellow dye, it is called picric or carbazotic acid.

By dissolving carbolic acid in oil of vitriol, sulpho-carbolic or sulpho-phenic acid is obtained, and by diluting this, and neutralizing with various metallic oxides or carbonates, the sulpho-carbolates are formed. These salts have been recently introduced into medicine. The sodium salt is $C_6H_5NaSO_4$, H_2O; the zinc salt $Zn''(C_6H_5SO_4)_2, H_2O$.

ACIDUM CITRICUM.—Citric acid is found in greater or less proportion in the fruits of all the orange tribe. It is prepared practically from lemon-juice or from lime-juice, by boiling with chalk until the acid is neutralized, collecting the insoluble citrate of lime thrown down:—

$$\underbrace{2H_3C_6H_5O_7}_{\text{Citric acid.}} + 3CaCO_3 = \underbrace{Ca''_3 2C_6H_5O_7}_{\text{Calcic citrate.}} + 3(H_2O, CO_2).$$

Suspending this in water and digesting it with a sufficient quantity of sulphuric acid:—

$$Ca''_3 2C_6H_5O_7 + 3H_2SO_4 = 2H_3C_6H_5O_7 + 3CaSO_4.$$

The addition of the chalk to the juice causes effervescence, from the escape of carbonic acid gas; the citric acid is wholly precipitated upon boiling in the form of citrate of lime, leaving behind, in solution, the other substances (mucilage, sugar, etc.), which are mixed with it in the juice. The sulphate of lime formed in the second part of the process is almost wholly insoluble, and is therefore filtered off.

Citric acid crystals are soluble in three-fourths of their weight of cold, and in half their weight of boiling water; they are easily distinguished from those of tartaric acid, by being much shorter and, as it were, rounder, and by giving no precipitate when added in excess to solution of acetate of potash, nor when added in moderate quantity to cold lime-water. Alum or bisulphate of potash would be detected in it by giving a white precipitate with chloride of barium. 7 grams of the acid are neutralized by the addition of 100 cubic centims. of volumetric solution of soda.

Citric acid is tribasic; out of the 10 atoms of hydrogen which it contains altogether, 3 atoms can be expelled by the action of metals by way of double decomposition. For instance:—

$$\underbrace{H_3C_6H_5O_7 . H_2O}_{\text{Citric acid crystals.}} + 3NaHO = Na_3C_6H_5O_7 + 3H_2O + H_2O.$$

If, then, 1 molecule of the acid is neutralized by 3 mols. of soda, $\frac{1}{3}$ mol. of the acid will be satisfied by 1 mol. of soda:—

$$\begin{array}{rl} C_6 &= 12 \times 6 = 72 \\ H_{10} &= 1 \times 10 = 10 \\ O_8 &= 16 \times 8 = 128 \\ & \overline{3)210} \\ & \overline{70} \end{array}$$

70 grams of the acid would then be neutralized by 40 grams of soda, or, which is the same thing, by 1000 c.c. of the vol. sol. of soda: therefore, 7 are neutralized by 100 c.c.

Crystals of citric acid, exposed to the temperature of boiling water, lose 1 mol. of water, which is merely water of *crystallization*, and can be taken up again. Heated more strongly, the residual dry citric acid again loses a mol. of water and becomes transformed into an acid, which is chiefly interesting on account of its identity with the acid of the aconite and of various species of the equiseta. It is soluble in ether, whilst citric acid is not:—

$$\underset{\text{Citric acid.}}{H_3C_6H_5O_7} - H_2O = \underset{\text{Aconitic acid.}}{H_3C_6H_3O_6}.$$

Acidum Gallicum. *Gallic Acid.*—Obtained by exposing crushed galls, in a moist state, to the air during a month or six weeks; then pressing out the black residual liquid and boiling the cake in water, which extracts the gallic acid from it. On cooling, the acid crystallizes out from the solution.

There is some difference of opinion as to the nature of the change which gives rise to the gallic acid in this way; it is probable, however, that under the influence of the "moulds" which form upon the mass, the tannin present is broken up into gallic acid and glucose, and that the latter, as it forms, is almost entirely oxidized to CO_2 and H_2O:—

$$\underset{\text{Tannin.}}{C_{27}H_{22}O_{17}} + 4\,H_2O = \underset{\text{Gallic acid.}}{3\,C_7H_6O_5} + \underset{\text{Glucose.}}{C_6H_{12}O_6};$$

and then—

$$C_6H_{12}O_6 + 6\,O_2 = 6\,CO_2 + 6\,H_2O;$$

possibly in a manner analogous to that by which the vinegar-plant promotes the oxidation of the alcohol in vinegar making.

Minute silky needles, soluble in three times their weight of boiling water, but only in 100 of cold. In dispensing gallic acid, hot water should not, therefore, be employed to dissolve it, or the acid crystallizes in large tufts on cooling. The aqueous solution gives a deep bluish coloration with ferric salts, but, when pure, it does not precipitate the vegetable alkalies nor gelatine as tannin does. [§ The crystalline acid when dried at 212° F., loses 9·5 per cent. of its weight.] This is only water of crystallization; but when heated to between 410° and 420°, it is wholly resolved into carbonic acid gas and pyrogallic acid, which sublimes in shining plates:—

$$C_7H_6O_5 = C_6H_6O_3 + CO_2.$$

Acidum Hydrochloricum.—A solution of real hydrochloric acid, HCl, in water.

On heating chloride of sodium (common salt) with sulphuric acid, it yields a colourless gas, which, if expelled into the air, forms a steamy fume, owing to the presence of moisture. This gas dissolves rapidly and readily when passed into water, forming the solution usually known as hydrochloric or muriatic acid, or spirit of salt. The sp. gr. of the official liquid is 1·16, and it contains 31·8 per cent. of HCl. The residue left in the flask or retort is acid sulphate of sodium.

$$NaCl + H_2SO_4 = NaHSO_4 + HCl.$$

Hydrochloric acid and all other soluble chlorides give, with solution of nitrate of silver, a curdy white precipitate, consisting of chloride of silver, AgCl, soluble in excess of ammonia, but insoluble in nitric acid.

[§ 11·48 grams mixed with half an ounce of distilled water, require for neutralization 100 c.c. of the volumetric solution of soda.]

$$1 \text{ mol. of } HCl\ (= 36{\cdot}5) + 1 \text{ mol. of } NaHO = NaCl + H_2O.$$

36·5 grams of hydrochloric acid gas would neutralize 1000 c.c. of the vol. sol. of soda, which contain 40 grams or 1 mol. of NaHO. 3·65 grams of HCl, or 11·48 grams of the liquid, will, therefore, neutralize the same amount, viz. 100 c.c. of the vol. sol. of soda. 11·48 of the liquid contain accordingly 3·65 of the gas:—what do 100 parts contain?

$$11{\cdot}48 : 100 :: 3{\cdot}65 : x. \qquad x = 31{\cdot}8 \text{ per cent.}$$

Commercial hydrochloric acid is liable to many impurities; *iron*, recognized by the colour, and by giving, when diluted, blue precipitates with ferro- and ferri-cyanide of potassium; *arsenic*, by giving, after dilution, a yellow precipitate with H_2S, also by tarnishing copper-foil boiled in it; *alkaline salts* ($NaCl$, Na_2SO_4, etc.), by leaving a residue on evaporation to dryness; *sulphuric acid*, by giving, with chloride of barium, a white precipitate; *sulphurous acid*, by the last test in the B. P., which is identical with that explained under Acidum Aceticum; *chlorine* or *nitric acid* would tarnish copper-foil, and would also dissolve gold-leaf. To ascertain if any gold has been taken up by the sample tested, add a few drops of a mixture of tin chlorides; purple of Cassius makes its appearance.

Acidum Hydrocyanicum Dilutum.—The official preparation is a solution of real acid, containing 2 per cent. It is prepared by distilling yellow prussiate of potash with sulphuric acid and water, and collecting the distillate in a receiver containing distilled water.

$$\underset{\text{Ferrocyanide of potassium.}}{2\,K_4(Fe''C_6N_6)} + 6\,H_2SO_4$$

$$= \underset{\text{Everitt's salt, or ferrocyanide of potassium and iron.}}{K_2Fe''(Fe''C_6N_6)} + \underset{\text{Hydrocyanic acid.}}{6\,HCN} + \underset{\text{Acid sulphate of potassium.}}{6\,KHSO_4}.$$

At the end of the operation the retort contains a solution of bisulphate of potash, mixed with a precipitate of the double ferrocyanide, which is generally green, from the action upon it of the air in the apparatus. The distillate is diluted with water, till 100 grains of it give, when mixed with excess of nitrate of silver, a precipitate of cyanide of silver, which, when washed and dried, weighs 10 grains.

$$\underset{27.}{HCN} + AgNO_3 = \underset{134.}{AgCN} + HNO_3.$$

From this equation 27 grains of HCN give 134 grains of AgCN; so that if the 100 grains of distilled liquid contain 2 grains, as they should, 10 (or more accurately, 9·926) grains of precipitate are obtained.

Hydrocyanic acid may be detected with certainty, even when present in minute quantity, by one of the following processes:—

a. [§ Treated with a minute quantity of a mixed solution of sulphate and persulphate of iron, afterwards with potash, and, finally, acidulated with hydrochloric acid, it forms Prussian blue.]

$$\text{I. } \underset{\text{Hydrocyanic acid.}}{6HCN} + \underset{\text{Ferrous sulphate.}}{FeSO_4} + \overbrace{2KHO + \underset{\text{Potash.}}{4KHO}} + xKHO$$

$$= \underset{\text{Ferrocyanide.}}{K_4(Fe''C_6N_6)} + \underset{\text{Sulphate.}}{K_2SO_4} + \underset{\text{Water.}}{6H_2O} + xKHO.$$

$$\text{II. } \underset{\text{Ferrocyanide of potassium.}}{3K_4Fe''C_6N_6} + \underset{\text{Ferric chloride.}}{2Fe'''_2Cl_6} + xKHO + xHCl$$

$$= \underset{\text{Ferric ferrocyanide, or Prussian blue.}}{Fe'''_4\,3(Fe''C_6N_6)} + 12KCl + x\overbrace{(KCl+H_2O)}.$$

b. Mixed with a few drops of solution of sulphur in sulphide of ammonium, evaporated to dryness, and then moistened with weak solution of ferric chloride, a red stain of ferric sulphocyanide is produced.

$$\text{I. } \underset{\text{Sulphide of ammonium.}}{(NH_4)_2S} + \underset{\text{Hydrocyanic acid.}}{HCN} + S$$

$$= \underset{\text{Sulphydrate of ammonium.}}{(NH_4)HS} + \underset{\text{Sulphocyanide of ammonium.}}{(NH_4)CNS.}$$

$$\text{II. } \underset{\text{Ferric chloride.}}{Fe_2Cl_6} + \underset{\text{Sulphocyanide.}}{6(NH_4)CNS}$$

$$= \underset{\text{Chloride of ammonium.}}{6NH_4Cl} + \underset{\text{Ferric sulphocyanide.}}{Fe_2(CNS)_6.}$$

Alkaline cyanides give no precipitate with a small quantity of nitrate of silver. So long as the proportion of nitrate of silver to cyanide is not more than one molecule to two, a double salt is formed, which remains in solution.

$$\overbrace{KCN+KCN}+AgNO_3 = \overbrace{KCN,AgCN}+KNO_3.$$

When even the minutest quantity of nitrate is superadded, a white precipitate of cyanide of silver begins to form.

$$KCN, AgCN + AgNO_3 = 2AgCN + KNO_3.$$

Upon this fact is based the official quantitative test. 10,000 c.c. of the vol. sol. of nitrate of silver contain 170 grams (= 1 molecule) of the silver salt, and if this quantity were added to 2 molecules or 54 grams of HCN, rendered alkaline by the addition of soda, the liquid would remain clear, but the next drop would produce a precipitate of cyanide of silver.

Now, if 10,000 c.c. indicate the presence of 54 grams of HCN in the liquid tested, the employment of 100 c.c. in the same manner, will indicate $\frac{1}{100}$ of 54, or ·54 gram of HCN.

The quantity of dilute acid which, according to the B.P., contains this amount is 27 grams, which corresponds to two per cent. of real acid; for if 27 contain ·54 what will 100 contain?

$$27 : 100 :: \cdot 54 : x.$$
$$x = 2.$$

Hydrocyanic acid is very liable to decomposition, but is more stable when mixed with a little mineral acid; much of the commercial preparation therefore contains a minute proportion of HCl. The chief products of its spontaneous change are formiate of ammonia—

$$HCN + 2H_2O = NH_4CHO_2,$$

and a brown substance, the nature of which is not understood.

Hydrocyanic acid is also found among the products of the action of water upon bitter almonds. These seeds contain a crystalline principle, *amygdaline*, and another substance of ill-defined albuminoid character, the composition of which is not known, called emulsin or *synaptase.* When both are dissolved in water, the latter, by some unexplained influence, causes the amygdaline to decompose.

$$\underset{\text{Amygdaline.}}{C_{20}H_{27}NO_{11}} + 2H_2O$$

$$= \underset{\text{Essential oil of almonds.}}{C_7H_6O} + \underset{\text{Glucose.}}{2C_6H_{12}O_6} + \underset{\text{Hydrocyanic acid.}}{HCN.}$$

On distilling the mixture, the essential oil and most of the hydrocyanic acid pass over. The aqua laurocerasi, B.P., contains HCN, produced by a reaction probably similar.

Review.

CHARACTERISTICS OF THE PRINCIPAL WINES WE DRINK. By A. DUPRÉ. London: Robert Hardwicke, 192, Piccadilly.

In a short pamphlet, reprinted from the 'Popular Science Review,' Dr. Dupré has given some interesting particulars relating to the common wines to be met with in the wine trade in this country. Towards the end of the pamphlet we notice a very complete table of analyses of Hock, Claret, Hungarian wine, Greek wine, Sherry, Port, and Marsala. The analyses are of recent date, and by himself; and, even if there were nothing else in the paper, they would render it a valuable contribution towards the chemistry of wine.

BOOKS RECEIVED.

A SYSTEM OF BOTANICAL ANALYSIS, APPLIED TO THE DIAGNOSIS OF BRITISH NATURAL ORDERS. For the Use of Beginners. By W. HANDSEL GRIFFITHS, Ph.D. London: Wyman and Sons, 74, Great Queen Street, Lincoln's Inn Fields. 1870.

SCIENCE FOR THE PEOPLE: A Memorandum of Various Means for Propagating Scientific and Practical Knowledge among the Working Classes, etc. etc. By THOMAS TWINING, Vice-President of the Society of Arts. London: C. GOODMAN, 407, Strand. 1870.

TREATISE ON FERMENTATION; ON THE SOURCE OF MUSCULAR FORCE AND NUTRITION. By JUSTUS VON LIEBIG, President of the Bavarian Academy of Sciences. Munich: F. Straub. 1870.

THE FOOD JOURNAL. No. 6, Vol. I. London: J. M. Johnson, 3, Castle Street, Holborn.

TRANSACTIONS OF THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN. No. 7, Vol. II. London: Wyman and Sons, 74, Great Queen Street.

ESSAY ON THE CULTIVATION OF CINCHONA. By CH. BELANGER, Director of the Botanical Garden of Martinique. Reprinted from the 'Revue Maritime et Coloniale,' April, 1870. Paris: Paul Dupont, 41, Rue Jean-Jacques Rousseau.

DIE PFLANZENSTOFFE IN CHEMISCHER, PHYSIOLOGISCHER, PHARMAKOLOGISCHER UND TOXIKOLOGISCHER HINSICHT. By Drs. AUG. and THEOD. HUSEMANN. Second Part. Berlin: Julius Springer. 1870.

Metrical System.—Of all irregular weights and measures, those in use by pharmacists in different parts of the world were perhaps the very worst. It is with especial satisfaction, therefore, we learn from Buchner's 'Repertorium für Pharmacie,' that in the new Austrian Pharmacopœia, which was issued a few months ago, the metrical weights and measures are adopted. The practice in Austria will of course determine that of the whole of South Germany.

[*** It is high time that a similar step were taken in this country, and in America, where even worse confusion reigns than here in regard to weights and measures.—Ed. Ph. J.]

British Association for the Advancement of Science.—This year's meeting of the Association will be held in Liverpool, on the 14th of September, under the presidency of Professor Huxley, and it is expected to be very well attended. We desire to call the attention of our readers to the fact that, in connection with the British Pharmaceutical Conference held during the same week, there will be an exhibition of objects, illustrating pharmaceutical processes and products. Intending exhibitors are requested to forward, as soon as possible, a description of the articles to be shown, with the space required, to the Honorary Secretary, Mr. Edward Davies, Royal Institution, Colquitt Street, Liverpool.

Preparation of Chloral Hydrate.—D. Müller and R. Paul point out that the chief point to be observed is the passage of chlorine into absolute alcohol until this is converted into a crystalline mass. The chlorine must of course be dry, the current must be copious, and it should be kept up for sixty or seventy hours.

The product thus obtained abundantly and almost pure, should be sublimed into two funnels set one above the other. The spout of one funnel is inserted into a small flask containing the hydrate, and the spout of the other serves as a discharging-tube.—*Report of the German Chemical Society.*

Obituary.

Peter Francis William Boullay, the well-known French pharmaceutist, died in November last year. He was born at Caen in 1777, of a Protestant family, and early devoted himself to the practice of pharmacy. He worked in Vauquelin's laboratory. In the year 1798 he opened a druggist's shop in one of the wealthiest and most frequented quarters of Paris. In 1803 he became a member of the Société de Pharmacie. In 1809, associated with four other pharmaceutists, MM. Boudet, Planche, Cadet, and Destouches, he commenced the 'Bulletin de Pharmacie,' the oldest and most esteemed organ of pharmacy in France, which under another name, viz. 'Journal de Pharmacie et de Chimie,' has survived to the present day.

Boullay was connected with, and took an active part in that Journal for sixty years. Among his contributions to science, should be mentioned his researches on different ethers, viz., on hydrochloric, arsenic, and phosphoric ethers, which he was the first to prepare. He discovered picrotoxin. Conjointly with Boutron, he investigated the Tonka-bean.

On the foundation of the French Academy of Medicine, he was named a member, and for the space of fifty years contributed to the memoirs of that learned body.

June 21; Mr. Benjamin J. B. Crampton, chemist and druggist, New Wortley, Leeds. Mr. Crampton and his wife were passengers by the Great Northern excursion train which met with the terrible accident near Newark, and both were killed on the spot.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

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

Chemists' English: An Echo of "A Voice from the Preliminary."

Sir,—In a recent issue of the 'Pharmaceutical Journal' attention was directed to the numbers who failed to pass the late Preliminary Examinations; and suggestions were offered for preventing these failures in future. Many besides candidates for examination might pay attention to these suggestions with advantage. With the exception, perhaps, of "historic houses," most chemists have occasionally to frame some kind of prospectus or trade circular; but whatever may be the commercial value of such a means of advertising when respectably carried out, it cannot be otherwise than derogatory to issue, as is frequently the case, productions positively ungrammatical, or disfigured by bombastic phraseology. Chemists in general appear unable to describe their qualifications and goods without mutilating the Queen's English or defying Lindley Murray. But for the efforts of the Pharmaceutical Society, our trade would probably have continued to exhibit that low type of intelligence which has for years past placed it, as a whole, considerably below other trades of corresponding social position.* Thanks, however, to the success which has attended these efforts, the once fashionable outcry that education, if not positively harmful to our interests, was of little practical utility, is no longer heard; and the results of this alteration in sentiment, and of our improved legal position, are becoming gradually manifest.

If, however, any difference of opinion might exist as to the relative practical value of the examinations of the Society, the Preliminary (especially as remodelled of late) may certainly, as regards the career of the future chemist, worthily take its place side by side with the higher examinations, although it stands only at the threshold of his professional curriculum. In any undertaking almost everything depends on a good beginning; nothing, therefore, can be more important than satisfactorily "to determine that a youth has been fairly educated for the business upon which he is about to enter." Years ago, as many now in business can testify, the Preliminary Examination was, in many cases, little more than a form; and we cannot, therefore, but admire the decision of the Board of Examiners to remodel it by introducing *written papers*, the results of which can be, in all cases, fairly and accurately determined at head-quarters. This change will undoubtedly in time have the very desirable effect of introducing into the trade a superior class of apprentices, and of deterring those from entering it who are educationally unfitted for its duties, to the manifest advantage of masters, pupils, and the public. Let intending candidates and apprentices, then, give good heed to this timely "Voice from the Preliminary" (nor let employers disregard it),—remembering that, besides enabling them to pass with credit, it will prove of great practical service to them betimes to rub up "their forgotten schoolboy's knowledge," and, as far as possible, to keep it always bright.†

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* What tradesman, for example, would think of carrying on his business without books? Yet the writer was informed not long since by the widow of a chemist lately deceased, that her husband *never* kept any books; and, on mentioning the fact to a wholesale druggist, he observed that it was by no means unusual amongst chemists. What was still more remarkable, however, was that the chemist in question left no receipt-books or memoranda of any kind, but, as his widow observed, "kept all his receipts *in his head*;" she added, and certainly not unjustly, "he was such a *clever* man."

† With reference to the stringency of the Preliminary Examination, so much objected to at the late Annual Meeting, it may be observed here, that while it is certainly right to show some leniency, for a time at least, to those who have

finished their apprenticeship, or even to apprentices who have been two or three years in the trade, it is clear that some period must be put to this sort of concession, or the object of increased stringency will not be attained. There will always be the same inducements for masters in country places to take lads of imperfect education, and keep them at "porter's work" from morning to night. True, there is, in such cases, neither time nor inclination for study; but whose fault is this? Is it not partly the masters'? And is it not a legitimate effect of the more stringent Preliminary Examination to *compel* employers to take no apprentices who have not had the requisite schooling, and to allow them *some* time at least for study? This is quite as incumbent on employers in the country as in London, for, though there may be more rough work in the provinces, country chemists have duties to perform quite as responsible as those falling to the lot of their London brethren. As a practical suggestion, it might be worth consideration whether, in time, it could not be made compulsory for every intending apprentice to a chemist to pass the Preliminary before his indentures were signed. Given a suitable education, this is no doubt the period when it would be most easily passed; and, where necessary, it would be better to wait a few months before entering on the apprenticeship, than to do so without having passed it.

On the principle that "one fact is worth a hundred arguments," and that "example is better than precept," a few samples of chemists' English, copied *verbatim* from a couple of circulars which have casually fallen into the writer's hands, are appended, in illustration of the above remarks.* They may serve to show the practical value of some acquaintance with English composition in compiling an ordinary trade circular.

Circular No. 1 (issued by A. B.) is remarkable rather for the peculiarity of its diction than for anything positively ungrammatical. Under the heading "Family Medicines," the first article named is described as follows:—

"A. B.'s Family or Antibilious Pills.

"For obviating habitual costiveness, removing giddiness, sick headache, loss of appetite, indigestion, flatulency, heartburn, nausea, nervousness, etc., arising from biliary derangement, visceral obstructions, etc.

"They are compounded entirely from the vegetable materia medica, *therefore require no keeping in the house.* . . . By taking *two or three doses* of these pills, *all* the above symptoms are speedily removed; an unusual degree of serenity pervades the mind . . . ."

And well it may after such a wholesale exorcism of almost "all the ills that flesh is heir to" as is here suggested. The ludicrous inequality of cause and effect clearly shows that the laws regulating the action of *physic* have (in this case at least) no relation to those of *physics.* Another marvellous remedy is—

"A. B.'s Pectoral Cough Mixture.

"This invaluable Medicine has the extraordinary (?) property of immediately relieving Coughs, Colds, Hoarseness, Difficulty of Breathing, etc. It immediately allays the tickling which *provokes* coughing, and removes the unpleasant sensation of *wheezing,* by dissolving the congealed phlegm, and freeing the vessels of the lungs from *acrimonious humours.*"

Towards the close of the circular the public are informed that "Leeches and Medicines, or any *article of necessity,* may be had on Sundays," etc.; and this curious production ends thus: "Every advice given respecting the uses and proper doses of Medicines. Although many of the most useful remedies have not received notice in the above List, it is not for the want of appreciation of their value or usefulness, but simply *from their number being impossible to enumerate all,* but *all* Medicines in general use, and the more recently introduced Scientific Remedies are kept in stock, or will be procured upon the shortest notice."

Circular No. 1 is, however, perspicuity itself compared with Circular No. 2, issued by C. D. The preamble strongly reminds one of the incoherent evidence of an old woman in a police court; it reads thus:—

"C. D. respectfully presents this List of Articles, soliciting *your* favours, and assuring *you* that no exertion shall be omitted to merit *your* patronage and recommendation.

"Personal attention is paid to the Compounding of Physicians' Prescriptions and Family Recipes, *and forwarded* with the least possible delay, *combined with* the greatest care in dispensing and economy in charges."

The following extracts speak for themselves:—

"Digestive Dinner Pills.

"Composed of Rhubarb, Ginger, Camomile, etc.

"They not only aid the Digestive Organs in performing their duty, but will also, *if persevered with,* restore them to their *original* strength."

"Succus Taraxaci.

"The expressed Juice of the Dandelion.

"Recommended for morbid conditions of the Liver and *Organs, subservient to Digestion,* and promoting a healthy secretion of bile."

[C. D. does not inform his customers *what* organs dandelion is good for, whether barrel or chamber; but as they are spoken of in close connection with a *liver,* probably the latter.]

The circular appears to reach its climax, however, in the annexed unambiguous description of the symptoms indicating the use of a familiar pill:—

"Compound Rhubarb Pills.

"Prepared *in accordance* with the British Pharmacopœia, *from the choicest Drugs.* A mild and cordial Aperient, particularly adapted to persons of sedentary habits, whose *confinement* produces Dyspepsia and *confined bowels.*"

We are then informed that "broken Chilblains, Chapped Hands and Lips, or any Irritation of the Face and Skin, are cured" by "Camphorated Cream,"—as the blackbeetles are said to be destroyed by the phosphorous paste,—"*in one night;*" also that "Arnicated Chilblain Liniment, *if* used *as soon as* the itching sensation is felt, will relieve on the *first* application," and that "Gout and Rheumatic Drops" *always* relieve.

The antithesis in the following is remarkably abrupt and striking:—

"Rosemary and Cantharidine Hair Wash.

"For preserving, cleansing, and *preventing the Hair falling off.*

"Confidently recommended for *producing a new Growth of Hair.*"

Two heads (though only *one* wash) are evidently referred to here, one on which there is merely *decadence* of growth and one *absolutely* bald; otherwise there would be a redundancy of properties in this wonderful wash, since by "preventing the Hair falling off," its power to "produce a new growth" would not be called into requisition;—unless (happy thought!) the meaning is that where there *is* hair it *keeps* it on, and where there *isn't* hair it *puts* it on. C. D. is clearly another Rowland, if he does not out-Rowland Rowland.

Although the above extracts thus irresistibly provoke a somewhat humorous treatment, they are not quoted in any sinister spirit, but as illustrations of the practical value of preliminary studies.

Perhaps the chemists in question did not compile these circulars; in that case, however, their dependence on others is a virtual confession of ignorance, while the fact that the circulars bear their names amounts to an indorsement of their contents. With reference to trade interests, it will probably be admitted that if people *do* read circulars (and it is useless issuing them if they do not), the perusal of such as those here alluded to (especially the latter), by persons of fair education, would so tend to depreciate their opinion of the intelligence and capability of the chemists issuing them, as to render such very unwilling to trust them with the preparation of their medicines. It is true, the inference may be unsound, since many a man mixes medicines correctly who makes a frightful hodge-podge of the composition of words and phrases; yet it is a very natural one, and in the main correct. As a rule, it would not be either safe or reasonable, in cases where knowledge is required, to infer a *special,* apart from a *general* capability. Under these circumstances, therefore, a chemist practically acquainted with his business might possibly suffer quite unjustly; so that, rather than send out an ill-worded circular, it is far better to issue none at all.

Nor are the above remarks by any means intended as a slur upon the trade as a whole. It is most gratifying to know that it includes men of acknowledged scientific standing, and that, both amongst pharmaceutists and chemists and druggists, there is a goodly number possessing a high educational as well as commercial status, and that this number is daily increasing. At the same time, it must be acknowledged that specimens of chemists' English little better, in point of

* Both these circulars emanated from shops within the London postal district, A. B. styling himself (though not on the circular) pharmaceutical chemist.

style and grammar, than those given above might be found—for example, in the 'Pharmaceutical Journal's' advertisement sheet.

How frequently wholesale druggists begin or end thus! "With Messrs. —— compliments, soliciting the favour of *your* orders." This use of different persons in the same clause is a very common error.

To those (if there be any) who think accuracy in style of no moment in trade announcements, it is sufficient to reply that persons who make mistakes do not do so intentionally, and would never think of defending their errors on the ground of expediency. There is a sort of involuntary admission amongst mankind that it is a duty to be correct in language as well as in behaviour or morals. But a practical reply might also be given. In these railroad times men have scant leisure; that which reads easily and tersely *is* read; that which reads enigmatically and clumsily is misunderstood or passed over. Besides, there is the *indirect* effect of correctness or otherwise on reputation, which no one can afford to disregard.

Unfortunately, slipshod composition is not a speciality of the drug trade, but common to all professions, as a copy of the 'Times' will easily prove. It is not at all unusual to find even educational advertisements to which just exception might be taken on this score, while general announcements are frequently unintelligible, and sometimes positively nonsensical. In all such cases, no less than in trade circulars, a little attention to the phraseology and composition would be a great advantage to both advertiser and customer in the opinion of

Echo.

"Sic Vos non Vobis."

Sir,—I have anxiously read the reports of the General and Council Meetings, but, so far as I can learn from them, I have reason to believe that, except in the President's speech, there has been no notice taken of the continued and untiring labours for a quarter of a century of Messrs. Squire and Morson as members of the Council, of the Board of Examiners, and each as three times President of the Society.

I do not pretend to know how regularly these gentlemen have attended the various Committee meetings of late years. but I can testify that they have been most active, and well fitted for the honourable posts they have filled; and I can also most confidently assert that, but for the zeal and perseverance of such as these, the Pharmaceutical Society would have sunk into oblivion.

I should like some of the readers of this Journal to calculate how many hours, at the lowest estimate, these gentlemen have devoted to Council meetings, examinations, etc. etc., at Bloomsbury Square; and without considering the money value of their time (which to men in business is great), I would remind them how large a proportion of their ordinary term of existence has been surrendered freely in our service, by forming, carrying on, and permanently establishing a system of education which otherwise we should not been able to avail ourselves of.

I am, Sir, yours truly,
Charles J. L. Russell.

Windsor, July 9th, 1870.

Anonymous Correspondence.

Sir,—I think Mr. Rimmington has shown a great amount of needless alarm on the subject of anonymous correspondence. I believe that it is the best way of bringing "juvenile talent" out, to let the writers please themselves with regard to the name. A great amount of useful information would be missed, were the edict, "no anonymous correspondence allowed," sent forth by the editor. Many young men have not the courage to write their first articles when compelled to subscribe their real name.

I remain, Sir,
"Juvenis et Imperfectus."

Barnsley, July 6th, 1870.

Dispensing by Medical Men.

Sir,—I have read with much interest the able letter of your correspondent "T. Mills, A.P.S." in a recent number of the Journal.

He forcibly sets forth the pitiable condition of a large number of chemists, who, though fully competent for their proper work, find it extremely difficult to eke out a subsistence, in consequence of the system (most objectionable as I think) of dispensing their own medicines, which is adopted by about 90 per cent. of the faculty.

I shall not here enter into the many arguments which can be urged against this system, but with great respect I would invite my *confrères* to unite together, and make a vigorous effort to bring about a better state of things.

It appears to me, that as a sweeping measure of medical reform will soon be passed by Parliament, chemists should agitate for *their rights*, and form themselves into some kind of "Chemists' Defence Association," the main object of which should be, to procure a legislative enactment by which medical men shall be prohibited (except in special cases) from dispensing their own medicines, and be compelled to write their prescriptions, which shall be compounded by duly qualified chemists. It is really absurd that gentlemen, to be registered by Act of Parliament as chemists and druggists, should go through a course of education in chemistry, pharmacy, etc., be obliged to pass a strict examination by the Pharmaceutical Society, and yet have hardly any opportunities of engaging in their peculiar work, viz. the compounding of medicines. This is an anomaly which should not be allowed to exist much longer. I earnestly hope that the aggrieved chemists will consider this matter, and should any of them wish to communicate with me, I beg to say, that letters addressed to me, care of Mr. Judd, Chemist, Alcester, Redditch, shall receive prompt attention.

Your obedient servant,
D. Carroll, LL.B., etc.
Registered Chemist (Exam.)

June 13th, 1870.

Inquirer (Ipswich).—Under the Pharmacy Act of 1869, it is unlawful for any one, not being a registered chemist and druggist, to sell retail vermin-killers containing any of the substances therein referred to.

Coating Pills.—An article on this subject will be found in Vol. III. s.s. p. 562.

A Minor Associate (London) desires to find a good test for detecting the presence of geranium oil in otto of rose.

R. M. S. (Islington).—Fresenius's work is undoubtedly the best.

W. H. Smith (Brighton).—The preparation of nitrite of amyle is described in the 'Laboratory.' It may be obtained from Robbins (Oxford Street) or Bullock.

A Constant Reader (Slough) desires to be informed as to the probable success of a pharmacist emigrating to Canada with a capital of £500 or £600 and a small family, cost of transit, etc.

I. W. (Sheffield).—1. Sulphur is used in making mercurial plasters, with the object of effecting the subdivision of the metal. 2. Tannic acid is sparingly soluble in *dry* ether, as stated under the head "Characters and Tests;" but with ether containing water it forms a thick solution. See Watts's 'Dictionary of Chemistry,' vol. ii. p. 760. 3. We are unable to answer this.

An Assistant (Leeds) writes to protest against the exclusion of anonymous correspondence, and urges that, in many cases, the writers' only fault may be excessive modesty.

Irwell (Hull).—The iron that will not dissolve may be used again, if necessary.

A. Z. (Liverpool) is desirous of obtaining formulæ for preparing fruit essences, such as plum, raspberry, etc., which are mixtures of ethers and essential oils.

"An Age of Progress."—Letters on this subject have been received from Mr. T. P. Gostling, Diss, Norfolk; J. B., Hull; A Provincial; and Mr. R. Goodwin Mumbray, Richmond.

W. D. Gibb (Winchester).—Received with thanks. Shall have attention.

A Country M. P. S.—We should be glad to hear from the writer, in confidence, on the subject of his excellent letter.

Eugene Rimmel.—Received with thanks. Too late for this week.

F. G. Homer (Birmingham).—Handed to the Secretary.

Voster Fide (Yarmouth post-mark).—We shall be glad to hear further from the writer.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W.*

ALCOHOLIC FERMENTATION.*

BY BARON VON LIEBIG.

Some years ago Pasteur inferred, from a series of experiments as to the behaviour of yeast in vinous fermentation,† that the explanation given by me of the action of yeast on sugar was destitute of foundation. I assumed that the breaking up of the fermentable substance into simpler compounds was to be referred to a process of internal change obtaining in the ferment, and that the influence of the ferment upon the fermentable substance, would continue or cease just as the metamorphosis of the ferment continued or ceased.

The transposition of the sugar atoms in the sugar molecule would thus be a consequence of the decomposition or dislocation of one or more constituents of the ferment,—it would take place only while the two were in contact.

Pasteur considers that "the chemical change in fermentation is essentially a phenomenon accompanying the vital activity of the yeast, beginning and ending with this: vinous fermentation never takes place without simultaneous organization, development, and reproduction, *i.e.* without continued vitality."‡ He regards fermentation as a chemical process, accompanying and dependent upon a physiological process. This view was entertained more than twenty years ago, and, although the nature of yeast was known to me when I put forward my view as to fermentation,§ the physiological process did not come within my province; my endeavour was to refer the chemical change of the sugar to some simple expression comprising all similar processes.

Pasteur has not gone into that which I sought to explain, viz. the disintegration of the fermentable substance in contact with yeast-cells, and, inasmuch as he refers us to "vital activity" as the cause of fermentation, he substitutes, for an explanation, a fact which requires explanation itself.

From the chemical point of view, which I cannot abandon, "vital activity" is a "state of motion," and, in this sense, Pasteur's view is neither inconsistent with nor contradictory of mine. It is matter of observation, I say, that yeast undergoes alteration when kept under water, and ultimately putrefies like animal substances. The commencement and termination of this process indicate that the parts of the yeast are in a state of transposition or motion, terminating with conversion into other compounds that are more simple and do not change further while air is excluded. In this case equilibrium is established when the motion ceases. The state of motion is quite independent of joint action in other substances. It is also observed that a great number of substances undergo alteration in the arrangement of their atoms when in contact with yeast, new substances being produced. Thus, for instance, sugar behaves as if it were a part or constituent of the yeast-cells; there is a transposition or dislocation of the sugar atoms.

Comparing, as I did, the action of the ferment on fermentable substances, with the action of heat on organic molecules, motion of the atoms is evident in both cases. Acetic acid is separated by heat into carbonic acid and acetone, just as sugar is separated by yeast into carbonic acid and alcohol. In the former case the carbonic acid contains two-thirds of the oxygen, the acetone all the hydrogen of the acetic acid while, in the latter case, the carbonic acid contains two-thirds of the oxygen, and the alcohol all the hydrogen of the sugar.

The development of a plant—the formation and increase of yeast—is dependent on the assimilation of food which is internally converted into parts of the living organism; but in fermentation there is, so to speak, an action outwards upon substances that are resolved into products not serviceable for the living organism. Obviously, vital action and chemical action are phenomena which must be considered separately in seeking to explain fermentation.

The view that the decomposition of sugar in fermentation is due to the development and increase of the yeast-cells, is opposed by the fact that yeast causes fermentation in a pure solution of sugar, for yeast consists chiefly of a substance containing nitrogen and sulphur, besides phosphates, which could not be furnished by the sugar. Moreover, beer-yeast causes a similar decomposition of other substances besides sugar; malate of lime is thus converted into carbonic acid, acetate, carbonate, and succinate of lime.

Hitherto sugar fermentation is the only case in which the formation of yeast, capable of separating sugar into alcohol and carbonic acid, has been observed. Malic, citric, and other acids contain no sugar, but they are decomposed like sugar by beer-yeast, and if its influence were due to the physiological process, it should have been increased and developed in these cases also.

Salicin also is decomposed by yeast into saligenin and salicylic acid, and a similar separation of salicin is caused by emulsin, without any recognizable physiological process being concerned in the change.

Emulsin acts upon salicin and amygdalin in like manner, its effects being recognizable in a few minutes by the new products,—in the case of salicin, by the violet coloration with perchloride of iron; in the case of amygdalin, by the formation of Prussian blue.

In the decomposition of amygdalin by emulsin, it is known that water takes part; only so much amygdalin is decomposed as corresponds to the water necessary for dissolving the bitter almond oil produced; any excess remains intact, but, if more water be added, there is further decomposition. Emulsion of sweet almonds, which may be regarded as a strong solution of emulsin, undergoes active vinous fermentation when mixed with grape-sugar.

If the decomposition of salicin by yeast be ascribed to the physiological process of growth and development of yeast, the action of emulsin upon salicin has still to be explained, and, if it be assumed that in this case the readily alterable sulphuretted and nitrogenous constituent of the sweet almond has caused the change, there is also a similar substance in yeast. Those substances are also alike in losing their power to excite fermentation when boiled with water.

But if substances containing sulphur and nitrogen, like emulsin, are, by reason of alteration in the arrangement of their atoms, capable of inducing change in other organic molecules, so that they separate into new products,—there is reason for suspecting that in the action which yeast exercises upon sugar, its sulphuretted and nitrogenous constituent plays a similar

* Read at a meeting of the Bavarian Academy of Sciences.
† Ann. de Ch. et de Phys. (3) vol. lviii. p. 323.
‡ *Ibid.* p. 359.
§ See Liebig's 'Letters on Chemistry.'

part. That being the case, it remains to explain what the relation of the physiological process in the formation of yeast may have to this substance, which obviously acquires its peculiar power of exciting fermentation only when it becomes a constituent of yeast.

It might be that the physiological process had no other relation to fermentation than that of determining the production of the material which induces the alteration of sugar and other organic molecules, by an action peculiar to itself,—like that of emulsin upon salicin or amygdalin. In that case the physiological process would be necessary for the production of that material, but it would have no further connection with the phenomena of fermentation.

Some experiments I have made in this direction will, perhaps, contribute towards the elucidation of the subject.

There is no doubt as to the nature of beer and wine yeast. It is a form of development of various fungi, and, when washed, consists of cell-membrane enveloped in primordial vesicle, a granular mucous substance, protoplasm, and a watery cell-liquid lying in the protoplasm as drops of various size. "By digesting in distilled water the globules increase in size, sometimes until their outer surfaces nearly touch the cell walls. This result is connected with the swelling up of the yeast-cells, and, like it, is due to membranous diffusion, by which water gains access to the cells, while the cell contents escape into the water."*

"Solution of iodine colours the cells faintly yellow; sugar and sulphuric acid produce a scarcely more distinguishable rose colour, indicating probably that the amount of albuminous substance has been considerably reduced by the action of water.†

I am in doubt whether the substance extracted from yeast by water is really albuminous. When one litre of fresh pasty yeast is washed by decantation four times in succession with six or eight times its volume of water, and the residue digested with four litres of water for three or four hours, only a small quantity of organic substance is extracted, less than 350 milligrams per litre of water, and the power of the yeast to excite fermentation is scarcely at all reduced. When the washed yeast is left for a long time with its own volume of water, the amount of organic substance in the water is increased tenfold, and what is thus extracted appears to be produced by decomposition of a constituent of the yeast. This substance communicates very remarkable properties to the water. Crystalline cane-sugar dissolved in it is rapidly converted into grape-sugar. Even within a few minutes Fehling's test gives a copious precipitate of suboxide of copper. The liquid has a very slight acid reaction, is without taste or colour; with basic acetate of lead and tannin it becomes slightly milky; after standing for some days exposed to the air it loses its transparency, and a white flocculent precipitate is formed.

To form some idea of the action of this organic substance on cane-sugar, I dissolved various quantities in the yeast-water, and estimated the grape-sugar formed after twenty-four hours. It appeared that 25 grm. dissolved in 100 c.c. was fully converted within twelve hours. This 100 c.c. of solution contained ·39 grm. of the organic substance, and I believe that a much larger quantity of sugar was converted in the same liquid. By heating this liquid to boiling it entirely lost its power of affecting sugar.

There can scarcely be any doubt as to the cause of this action, for yeast-water contains material in a state of change, and the conversion of cane-sugar into grape-sugar must be determined by that state of motion. The particles of cane-sugar behaved as if they were parts or constituents of the nitrogenous material, and they underwent transposition. Contact with a very small quantity of this changing material produced the same effect as contact with mineral acids,—the same effect as powerful chemical affinity.

A similar phenomenon is the action exercised by ethyl aldehyd upon cyanogen in aqueous solution; a very small quantity of aldehyd added to this solution determines the formation of oxamide by the union of the cyanogen with two atoms of water. Evidently the aldehyd (part of which is converted into a substance resembling acrolein during this change) produces an effect which consists in a rearrangement of the elements of cyanogen with those of water. Schmit and Glutz have recently observed that contact with strong hydrochloric acid causes the conversion of cyanogen into oxamide in the same way that it converts cane-sugar into grape-sugar. So likewise salicin is broken up by dilute sulphuric acid in the same way as by emulsin.

The nitrogenous substance produced in the germination of many cereal grains, and capable of converting starch into grape-sugar and dextrin, also loses this property when heated to the boiling-point of water. Emulsin acts upon salicin and amygdalin; helicoidin is converted by it into salicylic acid, saligenin, and sugar; arbutin into hydrochinon and sugar; but emulsin does not act on starch or cane-sugar. Diastase acts on starch, not on amygdalin; the substance in yeast-water acts upon cane-sugar, not on starch. A number of other substances act in a similar manner. Saliva acts on starch the same as diastase from barley; it decomposes salicin like emulsin into sugar and saligenin. The pancreatic juice contains a substance which converts starch into sugar, and fats into glycerin and fatty acids. Pepsin belongs to the same class. All these substances are nitrogenous; they all possess the character of becoming inert when heated to the boiling-point of water, and of disappearing after a short time. These substances differ considerably in composition, though they act in like manner; but each has its own peculiar mode of action, proving that this takes place in different directions.

The action of the substance contained in yeast-water is evidently different from that of yeast itself.

None of the chemists who have investigated the composition of yeast have obtained concordant results by analysis. Mitscherlich found 47 per cent. carbon, Schlossberger 50 per cent.; the former found 10 per cent. nitrogen, the latter 12·5 per cent. Reichenbach found 34·57 per cent. carbon and 7·41 nitrogen in four determinations with yeast dried at 100° C. This yeast was very active in the moist state. The composition of yeast may be said to vary from day to day, and this is probably a sure sign of the change that it undergoes incessantly.

Yeast contains sulphur as a constant constituent, and it evolves sulphuretted hydrogen during putrefaction. Mitscherlich found ·6 per cent. sulphur. Determinations in my laboratory with dry

* Lermer.

† According to Dr. Lermer's microscopic examination.

yeast gave ·685, in another case ·568,* and a third ·387 per cent.† The amount of ash also varies in yeast; it averages from 7 to 8 per cent., and contains much phosphate of lime, which is evidently in a state of combination similar to that in cereal grain, for it cannot be extracted by washing.

Two samples of yeast-ash gave the following results:—

	I.	II.	Mitscherlich.
Phosphoric Acid	44·76	48·53	59·3
Potash	29·07	30·58	28·3
Soda	2·46		
Lime	2·39	2·10	12·5
Magnesia	4·09	4·16	
Silica	14·36		
Chlorine, Carbonic Acid, Peroxide of Iron	2·12		

These are the same constituents, and nearly the same proportions, as in the ash of wheat and rye; after deducting silica, they are the same as in the ash of barley. Other fungi, such as truffles and the morel, contain a larger amount of potash.‡

	Tuber cibarium.	*Morchella esculenta.*
Phosphoric Acid	32·96	39·03
Potash	54·51	49·51
Lime and Magnesia	22·83	18·48
Sulphuric Acid	1·17	2·98

The deficiency of sulphuric acid in yeast-ash is remarkable; probably it is explained by the preponderance of phosphoric acid. The ash of ordinary champignons (*Agaricus campestris*) contains 24·29 per cent. of sulphuric acid, and only 15·43 per cent. of phosphoric acid.§

Fungi live as parasites on organic substances produced in the organism of other plants. Their spores have the same relation to the dead plants or animal remains, and to solutions containing their chief constituents, as the blossoms of annual plants (cereals, for instance), which have collected in the growing seeds, the substances contained in the leaves, stem, and roots. Just in like manner the protein substances, phosphates, etc., still remaining in the dead plant-remains, are transferred into the developing fungi, and acquire the form of albumin, legumin, sugar, mannite, cellulose, etc., by the influence of the organic action of the fungi. In decayed oak-wood, Schlossberger|| found scarcely a trace of phosphates, while the parasitic fungus (*Dædalea quercina*) growing on it contained a considerable amount. The instability of yeast when kept is well known: when left in a moist, pasty state, in a cool place, evolution of gas sets in. This gas is carbonic acid free from nitrogen. In the pasty yeast funnel-shaped hollows are formed, from which the gas escapes as from a crater; most of it, however, dissolves in the water, and evaporates with this. When the temperature of the moist yeast is raised, the evolution of gas is more marked; a froth is formed on the surface of the liquid, and the transformation of the yeast is accelerated. Even at 30° or 35° C. a true and almost violent fermentation takes place, just as in a solution of sugar that is mixed with sufficient yeast, and this evolution of gas goes on till the fermentation is ended.

Besides carbonic acid, this yeast fermentation yields another volatile product, viz. alcohol. This has been observed by both Pasteur and Béchamp. Pasteur has also found that when very little sugar is fermented with a great deal of yeast, more alcohol is obtained than corresponds to the sugar, and hence he inferred that alcohol must be produced from the yeast. Pasteur explains this phenomenon as follows:—"The beer-yeast consisting almost entirely of cells that have attained their normal development, or are, so to speak, full grown, is brought in contact with sugar, its life is renewed,—it sprouts. This is a well-known fact. If the liquor contains sugar enough, the buds develope; they assimilate sugar, and the albuminous material of the mother cells. In this way they gradually attain a certain bulk. This is a true picture of ordinary fermentation. If, on the contrary, we suppose the sugar to be insufficient for converting the first shoots into perfect cells, or even into fully-formed visible cells, this has to be done in some way with mother-cells; and, since external food fails, the young buds live at the cost of the mother-cells."

He explained the fermentation of yeast itself thus: The life of yeast manifests itself as soon as its conditions, moisture and warmth, are suitable. Like a seed always ready to germinate, yeast lives when it has the requisite temperature and water, at the cost of its own substance, and its vitality manifests itself by the physiological act peculiar to it,—the formation of carbonic acid, alcohol, succinic acid, and glycerine. If this yeast be brought in contact with sugar, its vitality, which is never interrupted, continues; but in this case it completes its formation with a very much greater apparent energy, because in the same time life and organization have much increased."

I must confess that I am not able to form a clear conception of Pasteur's view as to the cause of the fermentation of sugar and yeast as represented in the foregoing passage. He has enriched the history of fermentation with a number of interesting facts, but in regard to the cause of the breaking up of sugar, our insight into the matter has not been thereby increased.

It can scarcely be doubted that the yeast developed in fermenting beer-wort consumes a certain quantity of sugar for the formation of its cell-membrane; but it remains wholly unintelligible how the conversion of sugar into cellulose—of one carbon hydrate into another with less water—can induce the breaking up of another part of the dissolved sugar.

In one of his experiments, Pasteur mixed a solution of 9·899 grm. sugar with 20 c.c. of a clear watery solution of yeast and a trace of yeast. The liquid fermented, and the yeast added to it as a seed increased considerably. After the sugar was completely decomposed, the yeast was weighed, and it amounted to 152 milligrams. According to Pasteur, yeast contains on the average 18·5 per cent. cellulose. Substituting for this 20 per cent. of sugar, there would have been 9869 milligrams of sugar decomposed in this case, and 30 milligrams of sugar consumed for the production of yeast. But it is scarcely possible to think that the physiological act of transformation of 30 milligrams of sugar into the substance of the cell-membrane of the yeast can have been the cause of converting 329 times as much sugar into carbonic acid and alcohol, or succinic acid, glycerin, and carbonic acid products, which take no further part in the vitality of the cell.

* Reichenbach.
† Dempwolff.
‡ O. Kohlrausch.
§ *Ibid.*
|| Ann. Ch. et Ph. lii. 115.

Pasteur's explanation of the fermentation of yeast alone, with production of alcohol and carbonic acid from its own substance, is still more obscure. If the yeast-cell sprouts like a seed, and bears shoots at a suitable temperature and moisture, the substance of the old cell may be used for the production of new cells; this is intelligible, but it still remains unexplained whence come the alcohol and carbonic acid. The action of the new cells can only be the action of the substance constituting the old ones which they have consumed in their formation.

(*To be continued.*)

BAOBAB.

Adansonia digitata, L.

BY M. C. COOKE.

The introduction of the baobab as a secondary article of materia medica into the Pharmacopœia of India, will be sufficient excuse for directing attention to this somewhat new remedial agent. The baobab-tree is a native of Senegal and Sierra Leone, and has been introduced into India, where it has become well established in several districts. Humboldt states that "the oldest description of the baobab is that of the Venetian Aloysius Cadamosto in 1454. He found at the mouth of the Senegal trunks whose circumference he estimated at 17 fathoms, or 112 feet. Perottet says that he had seen monkey-breadfruit-trees (baobabs) which had a diameter of about 32 feet, with a height of only from 70 to 85 feet. The same dimensions had been given by Adanson in his voyage (1748). The largest trunks of the monkey-bread-fruit-trees which he himself saw in 1749, some on one of the small Magdalena Islands, near Cape de Verd, and others at the mouth of the Senegal, were from 26 to near 29 feet in diameter, with a height of little more than 70 feet, and a top measuring upwards of 180 feet across. Adanson, however, makes the remark, that other travellers had found trunks having a diameter of about 32 feet. French and Dutch sailors had carved their names on the trunks in characters six inches in length. One of these inscriptions was of the fifteenth century, while all others were of the sixteenth. From the depth of the cuts, which are covered with new layers of wood, and from a comparison of the thickness of trunks whose various ages were known, Adanson computed the age of trees having a diameter of 32 feet at 5150 years. In the village of Grand Galarques, also in Senegambia, the negroes have adorned the entrance of a hollow baobab with carvings cut out of wood still green. The inner cavity serves as a place of general meeting, in which the community debate their interests." While, however, the bold calculations of Adanson and Perottet assign to the Adansonias measured by them an age of 5150 or even 6000 years, which would make them coeval with the builders of the Pyramids, or even with Menes, these calculations must be accepted with doubt.

"In appearance *Adansonia* is unlike any other known tree; the enormous dimensions of its trunks bear a striking disproportion to the other parts. It is not unusual to find a trunk not more than 12 or 15 feet from the root to the branches, with a circumference of 75 or 78 feet. The lower branches are very long, and at first horizontal, extending perhaps 60 feet; the consequence of which is that they bend down to the ground, entirely hiding the trunk, and giving the tree the appearance of a huge mass of verdure. The wood is very soft, even when in perfection, and is subject to a disease which may be compared to the very malady of which its celebrated discoverer died,—a sort of softening of all the hard parts, so that the least storm is sufficient to overthrow and dismember its enormous bulk. A curious practice prevails among the negroes, of hollowing its trunk out into chambers, and therein depositing the bodies of malefactors, or of persons to whom the usual rites of sepulture are denied. In this situation the bodies become dried up, and soon acquire the state of perfect mummies."

The fruit of the baobab is a large, oblong, downy pericarp, from 6 or 8 to 10 or 12 inches in length, and in shape somewhat resembling that of the cacao-tree, but even, and without the longitudinal furrows of that species. It is from 8- to 10-celled, but in a dry state the partitions seem to be only formed by tough stringy fibres. Each cell is filled with a pulpy substance, which, when old and dry, becomes pithy, and in this the seeds are immersed. They are kidney-shaped, brown, shining, hard, with a few pale dots.

Baobab has obtained some repute as a remedy in dysentery, for which Dr. Louis Frank has affirmed its efficiency. The part employed is the acid farinaceous *pulp* surrounding the seeds. The *rind* of the fruit, beaten up into a paste with water, is also recommended. Dr. R. F. Hutchinson considers that the action of the farinaceous pulp is due, not to its astringency, but to its virtues as a refrigerant and diuretic. The *bark* has been proposed as a substitute for quinine in intermittent fevers by Dr. Duchassaing, in decoction, one ounce of the bruised bark to a pint of water boiled to a third. Although not mentioned in the Indian Pharmacopœia, the dried *leaves* are said to have been found serviceable in diarrhœa, fevers, and other diseases. Amongst the African negroes the fruit is a common article of consumption.

It must be confessed that confirmation is required of the value of all the forms of this drug, but there seems to be no doubt of its possessing some virtue, and being worthy of more systematic and extensive experiment. A good figure is given in the 'Botanical Magazine,' plates 2791 and 2792.

PURE CAUSTIC SODA.

For some time past pure caustic soda, prepared from metallic sodium, has been an article of manufacture. The method by which the metal is made to yield caustic soda is as follows:—A deep silver vessel, of a hemispherical form, and capable of holding about four gallons of water, is employed. Into this vessel, which is cooled externally with a current of cold water, is placed a very little water, and upon the water is placed a cube of metallic sodium of about half an inch in diameter. The vessel is made to revolve so as continually to bring fresh portions of liquid into contact with the metal, and by this means explosion is avoided. When the first cube of metal has dissolved, and yielded a thick syrupy liquid, a little more water and a second cube of metal are added, and the reaction allowed to take place as before, the vessel being kept in motion all the time. In this manner several pounds of sodium may be worked up into soda. The thick syrup so resulting is next evaporated down, heated to redness, fused, and poured into a mould.

Inasmuch as the price of sodium is five shillings a pound, the yield of soda from a pound of the metal being about one pound and three-quarters, it is plain that the alkali so prepared must be cheap. The danger of explosions (which, however, do not occur when proper care is taken) necessitates the employment of skilled labour in this manufacture, and constitutes a very serious drawback to the commercial success of the process.

NOTE ON THE DIVISION OF POWDERS BY THE EYE.

The practice of dividing powders by the eye (instead of by the balance), so often resorted to in dispensing, is illustrated by the following examples, which we quote from the 'Medical Times and Gazette.'

A number of packets of patent medicines having been purchased, each separate powder in the packets was weighed with the following results:—

Patent Medicine A.

Packet I.	Grains.	Packet II.	Grains.
1	2·25	1	1·49
2	2·23	2	1·87
3	2·22	3	2·07
4	1·99	4	1·84
5	2·09	5	1·57
6	1·42	6	1·60
7	1·83	7	1·60
8	1·73	8	2·78
9	2·74	9	1·93
	18·50		16·75
Mean	2·06	Mean	1·86

From which it appears, that with a mean weight of 2·06 grains for the single powder in a packet of this patent medicine, the weight of one powder taken at random may fall as low as 1·42 grains, or rise as high as 2·74 grains. It also appears that, with a mean weight of 1·86 grains, the weight of a powder taken out at random may be from 1·49 to 2·78 grains.

Patent Medicine B.

Part of a Packet.

1	4·27 grains.
2	5·60 "
3	5·80 "
	15·67
Mean	5·22

Patent Medicine C.

Packet I.	Grains.	Packet II.	Grains.
1	2·81	1	3·70
2	2·37	2	2·66
3	2·50	3	3·06
4	2·61	4	2·93
5	2·66	5	2·46
6	3·00	6	3·08
7	2·72	7	3·02
8	2·59	8	2·69
	21·26		23·60
Mean	2·66	Mean	2·95

Packet III.	Grains.	Packet IV.	Grains.
1	2·63	1	2·60
2	2·27	2	2·94
3	2·33	3	2·46
4	2·43	4	2·84
5	3·27	5	2·78
6	2·34	6	2·78
7	2·33	7	2·46
8	2·69	8	2·86
	20·29		21·72
Mean	2·53	Mean	2·71

FACTS AND REASONINGS CONCERNING THE HETEROGENEOUS EVOLUTION OF LIVING THINGS.

Under this title, in a paper recently published in 'Nature,' Dr. H. C. Bastian discusses the theory of spontaneous generation. He remarks that in all ages there have always been believers in the possibility that "living things of various kinds could come into being *de novo*, and without ordinary parentage," but that during the last hundred years this doctrine has lost ground. This he attributes partly to the effect produced by opening the field of microscopic research, and partly to the philosophical doctrines which have prevailed.

In order to combat the theory of the possibility of spontaneous generation, the Abbé Spallanzani propounded the hypothesis that "multitudinous, minute, and almost metaphysical *germs* existed everywhere, ready to burst out into active life and development whenever they came under the influence of suitable conditions." This was reinforced by the doctrine of "l'emboîtement des germes," contributed by Bonnet. Armed with these two hypotheses, one set of physiologists have maintained that the low forms of animal and vegetable life which make their appearance during the decay of vegetable and animal matter owe their origin to the development of germs previously diffused through the organic matter, or else reaching it by the atmosphere, which was supposed to be a kind of general reservoir of germs of all sorts. Another set of physiologists maintained that, under certain conditions, complex mixtures of organic matter have the property of evolving lowly organized living beings without requiring the pre-existence of their germs. The details of the controversy between these two sets of physiologists are to be found in the works of Pouchet, Pennetier, and Pasteur.

What is the degree of maltreatment which destroys germs? This question must of necessity occupy a front place in the controversy, and to this question Dr. Bastian first addresses himself.

Those who deny the possibility of spontaneous generation are naturally predisposed to attribute to germs a high power of resistance, for the harder it is to destroy germs, the easier will it be to show that in a given experiment the possibility of germs has not been eliminated. Little fear, therefore, that the *limit of vital resistance* has been set too low. Placed in a liquid, living things will succumb to treatment which does not destroy them when they exist in dry air or *in vacuo*. Comparatively few living beings, either animal or vegetable, are capable of sustaining a temperature of 75° C., if they are immersed in a liquid; and no instance of survival of a temperature of 100° C., applied for one minute, is on record. With regard to the spores of fungi and to bacteria and vibrios,—the living things whose history is in dispute,—there is direct and explicit evidence that they are instantly destroyed by boiling water. Vibrios and bacteria, indeed, appear to die at 55° C., according to M. Pouchet, and below 60° C., according to M. Victor Meunier. Dr. Bastian himself found them not only dead but disintegrated after exposure to boiling water for one minute.

With regard to the resistance in the dry state, a temperature of 130° C. is believed to be necessarily fatal to all organisms; certainly, however, a red heat must be fatal.

Many experiments on the possibility of spontaneous generation have been made as follows (the method being that used by Schwann in the year 1837):—

The solution of organic matter is boiled in a flask, and is by this treatment rendered germless. The neck of the flask opens into a tube containing red-hot pumice-stone, packed closely together. As the liquid cools, air will re-enter the flask, to occupy the vacant space above the liquid. But all air that re-enters has to pass through the tube armed with red-hot pumice-stone, and must, therefore, be in a germless state as it enters the flask.

Now, after the lapse of several months, sometimes living things have been found in the flask and sometimes not. Under these conditions, living things have been repeatedly observed by Schwann, Ingenhousz, Mantegazza, Pouchet, Joly, Musset, Jeffries Wymann, Dr. Child, and even by Pasteur himself, who, however, offers a kind of explanation in order to account for such a result. Under still severer treatment, Jeffries Wymann, of Cambridge, United States, has produced living organisms, viz. in a liquid which had been heated to 120° C., and excluded from *uncalcined* air. Professor Mantegazza heated to 120° C., Professor Cantoni, of Pavia, to 142° C., for four hours, and still obtained organisms.

The author's work is in confirmation of that of Pouchet, Wymann, Mantegazza, Cantoni, and others. He operated thus:—Into a small flask, of about two ounces capacity, was placed the liquid to be experimented upon, and which generally occupied about three-quarters of the flask. The neck of the flask was next drawn out by means of the blow-pipe flame. The liquid was next boiled, and whilst the steam was freely issuing through the narrow neck, the latter was made red-hot. The boiling of the liquid was then stopped, and the red-hot narrow neck sealed up by means of the blow-pipe. After being thus charged, the experimental flasks were maintained at temperatures of 23° C. and 29° C., until the experiment was complete.

By operating in this manner, he got distinct and abundant development of bacteria, vibrios, and leptothrix filaments in solutions of beef-juice and decoctions of turnip, carrot, and hay. The duration of the experiment varied from five days to about one month. The superiority of operations *in vacuo* over those in *calcined* air is insisted on; the influence of pressure being apparently to retard the vital process.

Another set of experiments embraced saline solutions made with distilled water.

Acetate of ammonia, and phosphate of soda gave nothing living after ten days.

Tartrate of ammonia and phosphate of soda, the solution having been boiled for twenty minutes, gave, in eleven days, abundant signs of confervæ.

In other experiments the sealed flask was exposed to a temperature of 140° to 150° in a Papin's digester, and, after this treatment, there was development of organisms, sometimes very abundantly.

NEW MATERIAL FOR BLISTERS.

The following formula for the preparation of a blistering material is given by MM. Delpech and Guichard:—

Take of Gelatine, 30 grains.
Water, 150 grains.
Alcohol, 150 grains.
Cantharidate of Potash, 6 grains.
Glycerine, a sufficient quantity.

The liquid is to be painted on thin sheets of gutta percha, in such quantity than 4 inches square (*i.e.* 16 square inches) shall receive about $\frac{1}{7}$ grain of cantharidate of potash.

The advantage of cantharidate of potash over cantharidine is, that it is not volatile, and does not lose in strength on exposure. It is prepared by the action of potash on cantharidine, and crystallizes in the form of fine scales.

ASHY CROWN CINCHONA IN VENEZUELA.

Dr. Ernst, the President of the Society of Natural and Physical Sciences of Caracas, has rediscovered the *Cinchona cordifolia*, Mutis, var. *rotundifolia*, Weddell (*C. rotundifolia*, Pavon), in the neighbourhood of Caracas, a specimen having been collected in 1829 by Dr. Vargas in the same place.

In an excursion made by Dr. Ernst, the trees were found in groups on the slopes of Papelon, Anauco, Galipan, etc., at an elevation of 4500 feet above the sea-level. The trees were covered with lichens (the *Graphis sulcata*, DC., being particularly noticed), and the largest of them had a circumference of 83 centimetres. The same tree is said probably to occur in Mariches, from whence small quantities of bark were collected for exportation sometime ago. The bark of this tree is known in commerce as Ashy Crown Bark, one of the Loxa or Crown Barks, and occurs in quills. From an analysis made by Señor Vicente Marcano, a member of the same society, 60 grammes of this bark yielded 3 decigrammes of quinine, and 4 decigrammes of cinchonine. The bark, however, was collected at the wrong season.

From Port Cabello another bark, known as Quina Maracaibo, is exported. This is the produce of the *Cinchona Tucujensis*, a tree growing only to the height of 12 to 15 feet, which is found in the forests surrounding the colony of Tovar. In the same forests are found *Cinchona* (now *Buena*) *Henleana* and *Moritziana* of Klotzsch. —*Vargasia: Boletin de la Sociedad de Ciencias Fisicas y Naturales de Caracas*, No. 7, 1870.

Accidental Poisoning by Arsenic.—A shocking case of poisoning through the ignorance of a servant-girl, has occurred at Cradley Heath, in Staffordshire. A little boy in the family where the girl was employed being ill, she resolved, in his mother's absence, to give him a dose of magnesia. Instead of it she gave arsenic, being unable to read the label on the packet. The little boy died. The girl, who took a dose of the poison herself, recovered.

Fatal Case of Accidental Poisoning.—Early on Saturday morning last, great excitement was created in the town of Ashbourn and its immediate neighbourhood, by a report that a whole family, consisting of a man and his wife, his son, a lodger, and female servant, had been accidentally poisoned in Compton. Mr. Abel Harrison (the deceased) and his family occupied a public-house in Compton. The house was undergoing repair, and advantage was taken of this to cleanse the bedrooms. For this purpose Harrison sent for some arsenic (according to the accounts that we can gather, amounting to about a pound), which a man named Welsh mixed with naphtha and turpentine, for the purpose of cleansing the walls of the bedrooms, using a syringe for the crevices which could not be got at with an ordinary brush. This took place nine days previous to the accident. On Friday night the family slept for the first time in the room, and on Saturday morning they all found themselves seriously ill. Surgeons were called in, and gave it as their opinion that they were all suffering from arsenic, which they had inhaled during the night. On Sunday night the deceased had a turn for the worse, and on Monday morning death took place about eleven o'clock. An inquest was held on Tuesday before the Coroner, Mr. Whiston, and a verdict of "Accidental Death" was recorded.

The Pharmaceutical Journal.

SATURDAY, JULY 23, 1870.

THE RULE OF THUMB.

In another part of this week's Journal will be found a set of specimens illustrative of the working of the *Rule of Thumb*. Each powder in six packets of patent medicines was weighed, and the weights showed a variation in quantity of from one to about two; the practical effect of this irregularity being, that the patient, when he takes a powder from a packet of such a medicine, will take half a grain or one grain of calomel, or something intermediate between these quantities, just as chance may favour him. It is a lesson to use the balance, and not to guess at quantities. Nothing is more delusive than the eye as a measure of the weight of powders. A practised eye will one day be strangely successful in making such valuations, and another day as strangely unsuccessful.

THE SEWAGE QUESTION.

The public interest is at present so deeply involved in the determination of an efficient remedy for the sewage nuisance, to which so large an amount of river pollution is due, and the "A. B. C." method has been so confidently advocated for the purpose, that the Royal Commissioners on River Pollution have considered it their duty again to submit this method to careful investigation. Though the results of their previous observations were objected to by the patentees, they did not admit the validity of the objections, and the results of further inquiry given in the Report, just presented to Parliament, fully confirms the unfavourable opinion previously expressed as to the efficiency of the A. B. C. method.

The following are the general conclusions arrived at by the Commissioners:—

"1. The process removes a large proportion of the *suspended* impurities from sewage, but on no occasion, when we have seen it in operation, has this removal been so complete as to render the effluent sewage admissible into running water.

"2. The 'A. B. C.' process removes a very small proportion of the soluble polluting matters from sewage. After treatment by this process, the effluent sewage is very little better than that which is obtained by allowing raw sewage to settle in subsidence tanks.

"3. The manure obtained by this process has a very low market value, and cannot repay the cost of manufacture.

"The manipulations required for the extraction and drying of this manure are attended with a nauseous odour, especially in warm weather, and would occasion a serious nuisance if the works were situated in or near a town.

"It would obviously be rash to set any bounds to the possibilities of chemistry. Substances may, perhaps, be hereafter discovered capable of combining with and rendering insoluble the filthy constituents of our town drainage; but we are compelled to admit that the present resources of this science hold out no hope that the foul matters dissolved in sewage will be precipitated and got rid of by the application of chemicals to the offensive liquid. The chemical affinities of these foul matters are so feeble, and the matters themselves are dissolved in such enormous volumes of water, that their precipitation is a problem of extreme difficulty."

The Commissioners add that the inevitable conclusion from their inquiry is unfavourable to the A. B. C. method in respect of its alleged power to hinder the pollution of rivers by town sewage, and that it is equally unfavourable as to the value of the manure manufactured by this method. The one statement is indeed in some sense the complement of the other; for just in proportion as the impurities of sewage escape separation, so must the value of the manure obtained from it be reduced.

It is interesting to note in reference to the important question as to the value of the A. B. C. manure, that "artificial fortification" is occasionally practised. It appears that during a recent visit to the works at Leamington by Dr. Miller and Dr. Odling, crystals of sulphate of ammonia were discovered in the manure that was being made.

There are also other points in Dr. Odling's evidence before the Royal Commissioners, which throw a very dubious light on this matter.

Dr. Letheby's paper on the subject, which is completed in this number, is in reality little more than an admission that sewage can be defecated by irrigation, and its contents utilized to some extent at least, while his argument against this mode of dealing with sewage simply amounts to the very obvious assertion that it must be properly conducted. This is a truism that few would dispute. It is remarkable that most of those who took part in the discussion declared the subject to be outside their province. Even among the opponents of irrigation there was little accord, for while Mr. Hawksley believed there was nothing to be learned, and Dr. Letheby asserted that medical men were alone competent to decide the matter, Dr. Cobbold regarded it as chiefly one for chemists to deal with. Moreover, in reference to the pollution of rivers by effluent water, Dr. Letheby's advocacy of precipitation methods, which remove so little of the impurity from sewage, is glaringly inconsistent with his assertion that they were preferable to irrigation, which has been proved to purify sewage to much greater extent, and for that reason offers a better prospect of utilization when properly conducted.

A propos of sewage, we learn from the 'Medical Times and Gazette,' that some members of the unfortunate British Association Committee have laid their troubles before the Council of the Association, stating in reference to the protest entered against their proceedings with the money subscribed by towns, that they felt it would be unbecoming in them and derogatory to the dignity of the Association to continue their labours; but we understand the Council resolved that there was no necessity for it to interfere.

LIEBIG ON FERMENTATION.

What is Fermentation?—almost like the question, what is combustion?—is a fundamental problem in chemistry. Many years ago, Liebig was the first to give a chemical interpretation of this subject. He has now returned to it, and recently presented to the Bavarian Academy an important memoir on Fermentation; a translation of the first part of which is to be found at the opening of this week's Journal.

The Secretaries of the British Pharmaceutical Conference are busy issuing a circular to announce particulars of the meeting in Liverpool, and to invite Pharmacists to become members. In future, an annual report is to be published, under the title of 'The Year-Book of Pharmacy,' and a specimen-page is sent with the circular. We hope this undertaking will succeed, and that it may prepare the way for similar reports on other branches of science, which have long been needed and talked of.

We have it on reliable authority that several leading surgeons have determined to visit the seat of the war, in order to make observations on wounds, and advance the science of military surgery.

A Pharmacist, writing to the 'Lancet,' draws attention to the difficulty caused by the continuation of the uncertain term, spt. æther. chloric. by medical men. The strength of such a preparation never having been given authoritatively, dispensers are quite at a loss what to use, and the preparation known under this name varies from 1 part chloroform in 6 of spirit to 1 in 14, 16, or 20 parts,—the result being alike unsatisfactory to prescriber, dispenser, and patient. He therefore urges medical men to adopt the recognized Pharmacopœia preparation and name *spiritus chloroformi*, containing 1 part chloroform in 20.

The 'Pharmaceutische Zeitung' states that the chloral-hydrate made by Roussin, of Paris, is alcoholate, and not hydrate of chloral. It yielded 61·7 per cent. of chloroform, and contained 23·7 per cent. of alcohol.

We learn from the 'Chicago Pharmacist,' that a small lot of quinine, stated to have been manufactured in London, and bearing the label "Light Sulphate of Quinine," was found to be devoid of quinine. The alkaloid appeared to be cinchonine in the state of hydrochlorate. In appearance it resembled sulphate of quinine, but on closer examination the crystals were found not to be so much interlaced.

We have received from M. Soubeiran the proof-sheets of an article about to be published by him in the 'Journal de Pharmacie et de Chimie,' giving an account of the history and organization of the Pharmaceutical Society.

We learn from the 'Times' that milk is an article of export from the States. The total value of condensed milk exported from the port of New York in the year 1869 was $79,652. Milk of the value of $21,870 came to England.

We have received from Dr. Chandler a copy of his report to the Metropolitan Board of Health of New York on poisonous cosmetics sold in New York under the names Circassian Rejuvenator, Bloom of Youth, Eugénie's Favourite, etc. He finds that most of them contain lead in considerable amount. This report has given rise to a complaint by the proprietor of one of these nostrums, that it has "inflicted a great wrong upon him, and almost ruined his business."

We are glad to hear that Dr. Weddell has a paper on the *Cinchonæ* in press, which will, we trust, settle, in some degree at least, the synonymy of the genus. It will be published in the 'Bulletin de la Société Botanique de France.'

The case of Hatun Huamang, the labourer employed by Tschudi "in very laborious digging" (mentioned in the article on Coca which we published last week), reminds us forcibly of the Welsh fasting girl. What would have been the result of a Guy's Hospital investigation into the powers of endurance of Hatun Huamang? By the bye, we learn from the daily papers that the father of the Welsh girl has been sentenced to twelve months', and the mother to six months' imprisonment.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

July 20th, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Hanbury, Haselden, and Southall.

Thirty-two candidates presented themselves for examination,—ten Major and twenty-two Minor; the following passed, and were duly registered:—

MAJOR (As PHARMACEUTICAL CHEMISTS).

*Clarke, Richard Feaver ...... Torquay.
Gibbs, James .... Bedford.
Romano, Frederick William Richard .... Rio Grande do Sul.
Hartt, Charles Henry .... Torquay.
Cotterill, Samuel .... Southampton.
Griffiths, Waldron .... Harrow.
Jackson, John Pim .... Leeds.
Pilley, Henry Thomas .... Lincoln.
Robson, James Crosby .... Darlington.

MINOR (As CHEMISTS AND DRUGGISTS).

*Haydon, William Frederic.... Blandford.
*Bowen, John William........ Handsworth.
*Hogg, Joseph Fawcett ...... North Shields.
Cooper, James .... Wycombe.

Braddock, Henry .... Oldham.
Butterworth, Albert .... Sowerby.
Reinhardt, William Tynedale. . Leeds.
Habgood, Henry .... Wells.
Ball, George .... Ormskirk.
Williams, John Havard ...... London.
Broad, John Morris .... Hornsey Rise.
Butterfield, Edward .... London.
Keightley, Joseph .... Tunstall.

The above names are arranged in order of merit.

EXAMINATION IN EDINBURGH.

July 11th, 1870.

Present—Messrs. Buchanan,

The following passed their respective Examinations :—

MAJOR (registered as a Pharmaceutical Chemist).

Howie, William Lamond .... Edinburgh.

MINOR (registered as Chemists and Druggists).

The names are arranged in order of merit.

Robinson, James .... Darlington.
Hay, James Henry .... Macduff.
Todrick, William .... Edinburgh.

MODIFIED (registered as Chemists and Druggists).

Bates, John Freer .... Manchester.
Clark, Simon Prince .... Glasgow.

PRELIMINARY (registered as Apprentices or Students).

Clark, Adam Douglas .... Kelso.
Gardner, Robert .... Kelso.
Graham, John .... Dumfries.

Three candidates were unsuccessful in the Minor Examination, and one candidate failed to pass the Preliminary Examination.

Errata in List of Local Secretaries.—P. 30, col. 1, for "Dorchester . . . Evans, Alfred," read "Dorchester . . . Evans, Alfred John;" p. 31, col. 1, for "Neath . . . Hibbert, William," read "Neath . . . Hibbert, Walter."

Meetings of Scientific Societies.

PARIS.—SOCIÉTÉ DE PHARMACIE.

1*st June*, 1870.

M. Mialhe, President.

The death of M. Leroux, the discoverer of Salicine, and one of the oldest correspondents of the Society, was announced. He was seventy-five.

M. Poggiale presented a note on the preparation of bromhydrate of quinine and cinchonine by M. Latour.

M. L. Soubeiran gave expression to his sense of the sympathy manifested by the Pharmaceutical Society of Great Britain, and of the cordial manner in which he had been received by the Society on the occasion of his recent visit to London.

MM. Boudet and Poggiale referred to the recent discussion in the Académie de Médecine respecting the "fortification" of wines.

The proposition made by M. Cap to form a French Pharmaceutical Association by affiliating the provincial societies to the Société de Pharmacie de Paris, was reported upon and discussed. It was not, however, adopted.

THE PRESENT PROSPECTS OF THE SEWAGE QUESTION IN RELATION TO THE PUBLIC HEALTH.

BY HENRY LETHEBY, ESQ., M.B.

(*Read before the Metropolitan Association of Medical Officers of Health, May* 21, 1870.)

(*Concluded from p.* 50.)

4. There is another very important objection to sewage irrigation — the danger of propagating parasitic diseases. Sewage contains myriads of ova of intestinal entozoa—every segment of a tape-worm discharged from the human body is crowded with them; and if distributed with sewage upon the land will become attached to the grass and other green fodder which is produced thereon. This is eaten by cattle, whose bodies quickly become infected with the parasite in its larval condition, and thus the measly meat becomes the agent of disease in our own bodies. At present, the distribution of these ova, and their access to the bodies of herbivorous animals, is entirely a matter of accident; but make it a matter of certainty, as most assuredly you will by distributing sewage upon the fodder-producing land, and the consequences must be serious. Dr. Cobbold, who is our highest authority on this subject, has published an essay to warn the public against the danger of this method of disposing of town sewage; and he has hinted at the probable introduction into this country of a terrible helminthic malady (*Bilharzia*), which is now common in Egypt, in Africa, and the Mauritius, and would assuredly be propagated throughout the land by this dangerous scheme of irrigation. "Have the kindness," he says, "to observe that every colonist returning from the Cape is liable to bring this parasitic treasure with him as a 'guest' indeed, dwelling in his blood, and feeding on his life stream. In the advanced stages of the malady, the afflicted individual must frequently evacuate the eggs and their contained embryonic larvæ, which are thus conveyed into the ordinary receptacles of such voidings. There let them remain, or convey them into a cesspool, and no harm follows. If deemed preferable, you may transport them, along with myriads of other human parasite eggs and larvæ, into a common sewer, and thence into the sea; still, entozoologically speaking, no harm follows. Here, however, let me invite you to pause; for if, without due consideration, you adopt any one of the gigantic schemes now in vogue, you will scatter these eggs far and wide; you will spread them over thousands of acres of ground; you will place the larvæ in those conditions which are known to be eminently favourable for the development of their next stage of growth; you will bring the latter in contact with land and water snails, into whose bodies they will speedily penetrate; and, in short, you will place them in situations where their yet higher gradations of non-sexual growth and propagation will be arrived at. After all these changes, there is every reason to believe that they will experience no greater difficulty in gaining access to our bodies here in England than obtains in the case of those same parasites attacking our fellow-creatures, whose residence is found in Egypt, in Natal, in the Mauritius, or at the Cape. In a natural history point of view, it would not be an altogether singular result, if, twenty years hence, this parasitic malady should be as prevalent in this country as it is now known to be in particular sections of the African continent. Foreseeing the possibility, not to say probability, of this contingency, am I not right," he says, "after years of long study, to raise my voice in the hope of preventing such a disaster?"

Nor is it unlikely that the Trichina may be distributed in the same manner, for it swarms in the intestines of those who have just become infected with it, and may be discharged into sewage, and scattered upon the land, and eaten by creatures whose flesh will give it back to us again. No one, indeed, but the helminthologist can say what particular parasite may not be distributed and propagated by this dangerous agricultural process. "May we not, indeed," as Dr. Cobbold observes, "but too reasonably conjecture that the wholesale distribution of tape-worm eggs by the utilization of sewage on a stupendous scale, will tend to spread abroad a class of diseases, some of which are severely formidable? So convinced am I," he says, "of the truth embodied in an affirmative reply to this latter query—so certain am I that parasites are propagated in this particular way—so surely do I foresee unpleasant results, if no steps be taken to counteract the evil, that I feel myself bound to speak out boldly, and to produce no uncertain sound in the matter which most closely concerns humanity." The whole question, in fact, is of vast hygienic importance.

But, fifthly, let us see if the system, in a sanitary point of view, is so successful as to render the sewage innocuous, before its admission into a running stream. Go to a sewage farm after you have given due notice of your intended visit, and you will be taken to places where the subsoil water is running from the land apparently pure and drinkable; and no doubt with proper management, under proper conditions of thorough and effective filtration, such a result may be achieved; but the real question is how far this is really and practically accomplished, for it involves such a nice adjustment of all the appliances, such a continuous distribution of the sewage over successive areas of land, and such constant supervision, that it is rarely effected. To judge of the results, therefore, you must visit these places, as I have done, without previous notice, and you must examine the whole district, for it is not uncommon to find byways for the disposal of the sewage which the land will not take. Not long ago, as I have said, I visited Aldershot, with Mr. Hawksley, Mr. Eggar, and Professor Ansted. This you know is a pet place with the advocates of the system, but at the time of our visit we found that nearly all the sewage was passing along the carriers to the outfalls, and going bodily into the river. I took samples of the sewage as it entered the farm from the two camps, and as it flowed from the farm to the river. The original sewage contained 54 grs. of soluble matter per gallon, and 44 grs. of insoluble, each of which contained about 30 grs. of organic matter. As it left the filter-tank it contained the same amount of soluble matter, and 35 grs. of suspended, of which about 26 grs. were organic. As it ran along the carriers to the lower part of the farm, it retained its black offensive character, and this was very marked upon that portion of the land where a little of it was distributed. At one of the outfalls into the Blackwater river it contained 52 grs. of soluble matter per gallon, of which 28 grs. were organic; and 3·84 grs. of suspended matter. At three other outfalls from the farm the soluble matters amounted respectively to 52 grs., 58 grs., and 54 grs. per gallon, of which 24 grs., 20 grs., and 22 grs. were organic; the suspended matters being 26 grs., 6 grs., and 5 grs. per gallon respectively, of which 12 grs., 2 grs., and 3 grs. were organic. At the several points of discharge into the river the sewage was black and fetid, and there were large accumulations of sewage mud in a high state of decomposition. I took a sample of the river water before it received the outfall sewage, and after; the former contained 19 grs. of soluble matter per gallon, and the latter 24 grs., of which the organic amounted to $3\frac{1}{2}$ grs. and 5 grs., the ammonia in the two cases being 0·264 of a grain, and 1·545 gr., showing an enormous pollution of the river by the so-called defecated sewage. Everywhere upon the land where the sewage had been distributed there were masses of fecal matter, waiting for the first heavy shower of rain to wash them away into the nearest outfall; the neighbouring ditches were in a most offensive condition, and we were told by the occupants of the houses adjoining the farm, that in times of flood the whole roadway was covered with sewage matters. Considering the praise which has been bestowed on the alleged success of this farm, I was not prepared to witness such a frightful condition of things.

At the Craigintinny meadows, near Edinburgh, it is notorious that the outfall water from the farm is shockingly offensive, but as it runs into the sea it is not complained of as a nuisance. A like condition of things, but not to such an extent, I have seen at Norwood, at Rugby, at Warwick, and at Banbury; in fact, at the last-named place the ditches around the farm were full of sewage, and the water was running from the outfall in a very offensive state, showing that the system, although susceptible of good results, is rarely so in practice, unless it receives an amount of attention that makes it a serious business. Besides which, there are times when no attention will prevent the discharge of foul sewage from the land, as when the soil is heavy, and a flood of rain sweeps over it, and when vegetation is dormant. In winter time it will freeze upon the land and kill the grass, and, as it thaws, run off to the nearest stream. At Warwick we saw acres of ground thus despoiled, where the defecation of sewage was entirely a matter of surface filtration. All authorities, indeed, agree that the success of this system is dependent upon a combination of circumstances which are not always attainable, and upon the strictest care and supervision. Even then, according to Dr. Frankland, although it may purify sewage to a great extent, it does not sufficiently purify it to render it admissible into potable water without danger; "the risk arising not only from the considerable amount of animal organic matters which the effluent water still retains in solution, but also from the absence of any guarantee for the removal of the germs or other noxious suspended matters which are frequently present in sewage."

The other means of dealing with sewage, so as to separate the suspended matters, and to remove a certain portion of those which are dissolved, is to submit it to chemical treatment. Already there are sufficient facts to enable us to review this part of the subject.

At Leicester, at Hertford, and formerly at Tottenham, the sewage was defecated with lime, the lime being used to the extent of from 5 to 20 grs. per gallon of sewage. The treatment is effected by adding the lime to the sewage, and then briskly agitating it; after which it flows into subsiding-tanks, where the sedimentary matters deposit, and the clear supernatant water runs off by a weir placed a little below the surface. At Hertford the supernatant water is filtered before it is discharged into the outfall, and in summer time a little chloride of lime, amounting to about half a grain per gallon of sewage, is also employed, as it is found to deodorize the sewage, to check secondary putrefaction, and to prevent the growth of the sewer fungus in the outfall channel. In the year 1858, when I first examined this process at Leicester and Tottenham, for Messrs. Bidder, Hawksley, and Bazalgette, the referees appointed by the Metropolitan Board of Works to consider the question of the main drainage of the metropolis, I found that with 12 grs. of lime per gallon of sewage the whole, or nearly the whole, of the suspended matters were removed, and that the soluble organic matter fell from $13\frac{1}{2}$ grs. per gallon to $10\frac{1}{2}$ grs. When 20 grs. of lime were used, the soluble organic matter fell to about 9 grs. On the occasion of a more recent visit to Leicester, with Dr. Frankland and Dr. Odling, at the instance of the Thames Conservancy Board, we found that the soluble matters of the sewage were reduced from 63 grs. per gallon to 48 grs.—the organic matter falling from 15 grs. to 5 grs. At Hertford, where the original sewage is remarkably weak on account of subsoil water, I have ascertained from many experiments that the organic matter in solution is reduced from about 3 grs. per gallon to 1·6 gr. All these results accord well with laboratory experiments, and they show, as I stated in my original report to the referees alluded to, that, "judging from the experiments which I have made, and the observations of practice on a large scale, it is ascertained that about 12 grs. of lime to a gallon of sewage will effect the speedy separation of all the suspended matters, and also about one-fourth of the dissolved organic matter, leaving a clear liquor which has lost a great part of its offensive odour; and when the clear liquor is mixed with from five to seven times its bulk of water, and is exposed to the air, it is no longer offensive."

At Leicester, where the lime method has been adopted, the river Soar, into which the sewage flows, has undergone a remarkable improvement. Before the works were established the river was most offensive, the fish were killed, the vegetation of the river was destroyed, and those who inhaled the effluvia from it were constantly ill. At the Belgrave Mill, which is just below the point where the sewage enters the river, the foulness of the stream was such that in summer-time the water of the mill-dam appeared to boil with putrefaction; the stench from it was intolerable, and so large was the quantity of sulphuretted hydrogen evolved, that the silver in the men's pockets turned black in a few hours. At that time the men were constantly afflicted with diarrhœa, they lost their strength, and their appetites always failed them; one man only out of thirty men in eighteen years had been able to stand it, and he it was who gave me an account of the matter. Now, however, and for the last three years since the lime process has been adopted, the river presents an entirely different appearance—aquatic plants have begun to flourish, the fish have ventured to return, the black mud has ceased to accumulate, and the mill-dam is no longer offensive. All along the stream the people speak of the change with satisfaction, and it would appear that the process fulfils the requirement of the local Act, which demands that the water discharged from the works shall not occasion a nuisance, or be injurious to the health of those who live or are employed on the banks of the stream.

Crude sulphate of alumina is another precipitating agent. It is employed at Stroud, in Gloucestershire, in what is known as Bird's method. The crude sulphate is made by adding about 20 lbs. of sulphuric acid to 1 cwt. of powdered clay, and allowing it to stand for some time. This material is mixed with sewage in the proportion of 1 cwt. to from 20,000 to 30,000 gallons of sewage, and the sedimentary matters are collected in a properly-constructed tank. Sulphate of alumina is decomposed by the ammonia of the sewage, and the alumina flocculates and precipitates the suspended matters, leaving a clear supernatant liquid, from which a good deal of dissolved organic matter has been removed.

To ensure the precipitation of the alumina, Dr. Anderson, of Coventry, recommends the addition of lime. He uses about one pound of crude sulphate to every 100 gallons of sewage. This mixture is well agitated, and then a quarter of a pound of lime in a creamy condition is added. Again it is agitated, and the flocculent alumina, together with the suspended matters, rapidly falls. The sediment is collected in subsiding-tanks, which are worked alternately, and the clear liquor is run off from it. As in the last case, the suspended matters are entirely removed, with a considerable amount of the dissolved organic matter.

Chloride of iron, with lime, is also a powerful defecator. It was formerly used at Northampton, and is still, to some extent with lime,—the lime being first added to the sewage in the proportion of about a bushel to 8500 gallons of sewage, and the chloride of lime to the extent of about half a gallon! The chloride is made at the works, and contains about 9500 grs. of the mixed chlorides of iron per gallon. In this case also the precipitation of the sewage is very complete. At present, however, the local authorities are using sulphate of iron and alumina instead of the chloride. The compound is made by mixing 3 cwts. of crude sulphuric acid with 2 tons of a ferruginous earth obtained in the neighbourhood. After standing for a few days the mixture is ready for use, and it is added to the sewage in the above proportion to a million gallons of sewage.

At Leamington, where there is an injunction against the discharge of unpurified sewage into the river Leam, the authorities have resorted to the use of the "A. B. C." process of Mr. Sillar, which is worked by the Native Guano Company at its own cost. The sewage flows to the works by gravitation, and there it is mixed with the A. B. C. material (consisting of alum, clay, sulphate of magnesia, bone ashes, wood charcoal, and a little blood diffused through water). The material is added to the sewage in the proportion of 1 gallon to 200 gallons of sewage, and the whole of it well agitated. It then flows through subsiding-tanks, where the precipitated matters subside, and the clear water flows off from a weir into an outfall channel with a filter. The tanks are worked continuously for about a week, when the precipitated matter is removed to a centrifugal machine, and drained to the consistence of putty. This is further dried by exposure to the air, and its ammonia is fixed by means of a little sulphuric acid, which also breaks up the organic matter. In this state it is riddled, and sold freely at a good profit for manure.

Samples of the Leamington sewage were taken for examination by the Royal Pollution Commissioners on the 11th of December last, and duplicates of them were furnished to me on the following day for analysis. I ascertained that the original sewage contained 66 grs. of solid matter in solution per gallon, of which 14·43 grs. were organic, while the effluent water before filtration contained 67 grs. of soluble matter per gallon, of which 11·27 grs. were organic, and the filtered water contained 61 grs. per gallon, of which 7·58 grs. were organic. Again, the suspended matters in the original sewage amounted to 113·6 grs. per gallon, while in the effluent sewage before filtration it was 7·64 grs., and in the filtered sewage 3·12 grs. The Royal Commissioners, in describing their results, do not mention the filtered water, but in other respects their results accord pretty closely with mine.

Lastly, there is a method of the late Mr. Blyth, which is very deserving of attention. Mr. Blyth was the chemist of the old Board of Health, and he had great opportunities of studying this matter. His plan is first to add a soluble phosphate of lime and sulphate of magnesia to the sewage. After agitation, the mixture is neutralized by means of a little slaked lime, and the precipitated magnesian phosphate carries down with it the whole of the sedimentary matter, and a portion of the soluble ammonia. A million tons of sewage require about 1 ton 3 cwts. of Blyth's compound, and 4 cwts. of lime for neutralizing. The resulting dry precipitate weighs about 3 tons 8 cwts., and contains about 58 per cent. of organic matter (yielding 4·5 ammonia) and 8·66 of phosphate of lime.

All these methods are manifestly capable of separating from sewage all the sedimentary matter, and also of removing considerable portions of dissolved organic matter; but to be effective there should not only be good agitation of the sewage after the addition of the precipitating agent, but there should also be sufficient tank-room for the deposition of the sewage for not less than four hours; and there should also be a means of filtering the defecated sewage before it is discharged into the river or other watercourse.

After witnessing the action of lime as a defecator at Leicester and Hertford, Dr. Odling, Dr. Frankland, and myself reported to the Thames Conservancy that the following were the conditions necessary to its success:—

1. The proportion of lime should not be less than one ton to a million gallons of sewage, and there should also be used 56 lbs. of chloride of lime.

2. That the mixture of the sewage with the lime and chloride of lime should be very complete, and that the mixture should be agitated, so as to aggregate the suspended matters, and thus assist in the subsequent precipitation of suspended matter.

3. That the sewage when thus treated with lime

should flow along two subsiding-tanks in series; the first should be capable of holding at least one hour's flow, and the second of holding not less than four hours' flow. The tanks should be four deep in depth, and the overflow of the defecated sewage should be by a weir only half an inch below the surface.

4. That there should be a double set of tanks for alternate working.

5. That the defecated water should flow through a shallow open conduit of not less than a quarter of a mile in length before being received into a stream of freely running water, of not less than eight or ten times the volume of the defecated sewage.

In this way, or by any similar method of defecation, the sewage of towns may be easily and safely dealt with, so as, on the one hand, to ensure its purification before it is discharged into a running stream, and, on the other, to avoid the many dangers of irrigation.

I refrain from entering on the subject of the pecuniary aspects of this question, for they are nowhere encouraging, notwithstanding that the most sanguine opinions have been expressed of the commercial and agricultural value of sewage. Irrigation, like precipitation, except in the case of the Leamington method, is everywhere unprofitable, when it is conducted in such a manner as to prevent the pollution of the neighbouring streams; and I warn you against the glowing accounts which are given of the profitable returns of certain sewage farms, for, if the cost of outlay is considered and balanced with the average returns, it will always be found to be a losing affair. The most sanguine enthusiasts have generally abandoned the system after a trial of its merits. Little or nothing, in fact, can be profitably grown upon the sodden land but Italian rye-grass, and when this is abundant it must be cut, or it will rot upon the ground, and it must be sold for what it will fetch. In the summer of 1866, when I was in Edinburgh, I saw acres upon acres of rye-grass rotting upon the far-famed Craigintinny meadows; and when I asked the cause of it I was told by the manager that the cattle plague had ruined his customers, and there was nobody to buy it and nothing to eat, and there it must rot. Besides which, there are considerable doubts as to the value of it as fodder. Mr. Campbell, of Rugby, who ought to be a high authority on the subject,—for it was a pet of his,—honestly declares that his experience does not show a profit in the use of such fodder, and he gives a good example of it. Twelve Ayrshire cows, which calved about the same time, in May, 1869, yielded, at the end of twelve weeks, an average quantity of 9½ quarts of milk per day per cow. Their daily consumption of rye-grass was 1½ cwt. per cow. If they had been milked for nine months, the average daily yield of milk would have been only from 5 to 6 quarts per cow. The cost of the grass, at 10*s.* a ton, was 9*d.* per cow per day, and the other expenses of the dairy raised it to 1*s.* 3½*d.* per cow. The milk, at 8*d.* per gallon, was worth only 1*s.* 7*d.*, and when the cost of sending it to market was taken into account, together with the wear and tear of utensils, he vainly asked for profit.

But all this is, as I have said, no part of my present inquiry, for my business is solely with the sanitary part of the question; and I would ask you whether, having regard for the public health, there are not serious dangers in the rash recommendations of the Royal Pollution Commissioners to scatter the sewage of every city and town in the kingdom broadcast upon the land? Medical authorities of some sanitary experience are alone able to engage in such important pathological considerations, and it must strike every one who is interested in the subject, that a Royal Commission, without any pretence of medical knowledge, is singularly incompetent to deal with such a matter. What importance the public or Parliament may attach to their recommendations I am unable to learn, except from former experience, but it is clearly our duty, as public health officers, to examine the subject from a medical point of view, and I doubt not what will be the conclusion.

Dr. Cobbold said that individually he regarded the sewage question as one which was three parts out of four a chemical question. On this account he thought the chemists should have the advantage of speaking first upon it. Dr. Letheby had referred specially to the remarks made by him in his *brochure.* Now, though the observations he made there were written in a warm, perhaps too warm a strain, he believed there was no statement which he was not still prepared to substantiate. And he thought since he had gained more experience in experimental researches, that he could now write a pamphlet much more cogent than that to which Dr. Letheby had alluded. With reference to parasitic diseases, he would only say that he knew of two patients in this country who were suffering from that frightful malady which was so destructive in Egypt. These patients at every urinary discharge must pass a number of the eggs of this parasite, and if the number of persons so afflicted was increased fivefold, the chances of the extension of this disease must likewise increase. But happily there were so many contingencies which the parasites had to encounter before they arrived at the human body that the community were yet spared; still he held by the statements contained in his pamphlet. Then take the case of ordinary tape-worm disorders, respecting which he had had much experience. There were about 3000 persons in London suffering from this cause, who each passed from four to twelve joints a day, each joint containing 30,000 mature eggs, which would give at least a daily return of 450 millions, but he believed 1000 million eggs was nearer the mark. A certain number of grains of organic matter per gallon were found by chemists in sewage, of which organic matter these eggs must be part and parcel. A handful of large entozoa parasites had been taken from the Craigintinny meadows. If this sewage was distributed far and wide, it was certain that a considerable portion of these millions of eggs must gain access to the herbivora. It was known, from experimental researches, that measles were developed productively in beef. It was a popular notion that pork only developed measles, but he would assert that in underdone beef persons ran a greater risk. The proportion of tape-worm disease derived from measly beef was as seven or eight to one in the case of pork. It was, therefore, to incur an enormous risk to distribute sewage which contained these germs over the land. It was possible to decimate the population of any town within a certain number of months by the distribution of tape-worm germs, there being one tape-worm in particular which produced a disease of the human body at present causing the death of 400 persons annually in this country. If that parasitic disease should increase in the same proportion as other parasitic diseases, such as the ordinary tape-worm, a result would follow such as still obtained in Iceland, where one-sixth of the population died annually from this cause. Having these facts to deal with, and knowing the developmental process through which these parasites passed, he thought they were called upon to ask people to pause before adopting a scheme so gigantic as that now proposed, fraught as it was with consequences so serious as those which he believed were involved in it.

Mr. Holland said he did not believe any portion of Dr. Letheby's paper, and he thought the writer was inconsistent with himself. In the first place he alleged that twenty times its volume of water would purify the sewage poured into it, and afterwards he asserted that even a small quantity of water from irrigation meadows was poison. Was Dr. Letheby prepared to recommend that the soil should be burnt; if not, what did he propose to do with it? Unless he was prepared to recommend that all human manure should be burnt to avoid the supposed risk, his argument went for nothing. He (Mr. Holland) believed that the danger of spreading dis-case by the irrigation system was purely imaginary. Where was the evidence of disease having been produced where the system was adopted? He had made inquiries on the subject and could find none. At Carlisle he asked whether the sheep had the rot, and was answered that they had not. At Edinburgh cows had been fed with grass from the irrigated meadows for sixty or seventy years, but there was no evidence of the prevalence of disease among them. It was true that they were not very healthy, but this arose from their mode of life. Everything was done to stimulate the production of milk from them, and they suffered from want of exercise and fresh air. Sewage was nothing but manure suspended in water, and the error was not in putting it on the land at all, but in putting it on in excess. At Carlisle he had been told that the residents in the neighbourhood of the irrigated fields were unhealthy, but on inquiry it turned out that there were no inhabitants in close proximity, and of those who were anywhere near, there were abundant causes of unhealthiness in the condition of their houses.

Dr. CARPENTER considered that the arguments of Dr. Letheby were based upon a false foundation, and that either he had little practical acquaintance with the facts from which he had drawn his inferences, or had taken only such portions of them as were calculated to sustain his view of the case. Dr. Letheby had alluded to some statements made by him, and had specially referred to the sanitary state of the fields at Beddington. The people of Croydon were among the earliest to adopt any sanitary arrangements at all. They were compelled to adopt some plan, because of the terrors of the law—no less than five or six injunctions having been obtained against them, and the Local Board were threatened with committal to prison unless they ceased to do certain acts. That was in 1858, and in 1859 and 1860 they obtained powers to do what they had since continued to do. In 1860 the irrigation meadows were laid down, and they had been in active operation to the present time. Until this year no complaint, either officially or otherwise, had been made of injury arising from these meadows. Previous to 1860, the town had been put to thousands of pounds expense for damage occasioned by the sewage, but from that year till within the last nine months they had been free from such liability. In 1860 they laid down 276 acres of land for the purpose of irrigation, and to remove the mischief which 19,000 people produced by their sewage. Since then the population of the town had increased to 50,000, and he was free to confess that the quantity of sewage was too much for the land. The result had been that occasionally of late the water was not so effectually purified as it should have been. Until 1867 no cases of fever occurred there. The water of the effluent stream passed through the grounds of a gentleman residing in the neighbourhood, and even at the present time trout might be seen swimming about in it. That being the case, was it not evident the plan adopted for dealing with the sewage was the correct plan? Indeed, Dr. Letheby said so himself, and it had been shown in that room that, if sewage were made to pass through five feet of earth, it would be rendered perfectly innocuous, and would be perfectly oxidized. Surely, then, the passage of sewage over land where it was exposed to the air, and came in contact with growing vegetable matter, would remove from it all those elements which were injurious to health, and the water would go off perfectly pure. Dr. Letheby was in the position of an engineer, who, some years ago, wrote a pamphlet to prove that it was totally impossible for a steamboat to cross the Atlantic, because she could not carry sufficient coals, the pamphlet being issued at the very moment that a steamer was actually accomplishing the feat. The town of Croydon was a standing proof that sewage could be successfully disposed of in the way Dr. Letheby asserted to be impossible. With regard to the question of health, he might state that, since the beginning of the year, there had not been a single case of fever reported to the Board of Guardians from Beddington, and he might add, as the medical attendant of most of the wealthy families there, that he had not had a single case of fever, either typhus or typhoid, among them since the irrigation meadows commenced. With reference to the effect upon the inhabitants of Croydon proper, surely, if the emanations from the farms were so dangerous as represented, the inhabitants of the densely populated low-lying parts, which were within 500 yards of the outfall of those farms, would have suffered from typhoid. But for a long period there had not been a single case in that low district, and with the exception of a few cases of scarlet fever there had been no fever there at all. The irrigation system went on during the winter as well as the summer, and in the former period of the year the water had gone off pretty nearly free from those elements which were injurious. This was the result of experience of the system forced upon the parish of Croydon, and which they had not taken up of their own will. Having observed the system, and seen its effects, he was positively convinced that the air which passed over the fields, instead of being injurious, was a benefit to the people living around. It was a positive fact, with regard to Norwood, that the moment the irrigation fields were established the mortality fell from 18 to 15, and had remained so. Dr. Letheby said he had evidence of water coming off the fields in an impure state. He (Dr. Carpenter) knew that there had been such instances, arising from the fact that persons had gone to the fields, broken down the carriers, and pulled at the sluices, letting the water out. Dr. Letheby knew very well that the argument to be drawn from the chemical analysis of the water was valueless, unless he was aware of all the circumstances of the case.

Professor ANSTED, being referred to by the chairman, as having had experience of these matters in connection with the city of Milan, said he hardly felt qualified to take part in the discussion, although, perhaps, so far as a certain amount of familiarity with works of this kind went, he might be able to afford some little information. The general subject appeared to him as far more belonging to the medical man than the geological engineer, if he might so denominate himself. Having had the opportunity, now and then, of noticing the results obtained during the irrigation of considerable tracts of land on a large scale, with material more or less mixed up with sewage, he thought he was justified in saying that in most cases, if not in all, those results had been certainly unfavourable to the general health of the neighbourhood. The chairman alluded to his experience at Milan. He knew the town well, and the way in which the sewage was conducted over the fields in the lower part of the town, and he believed, on the evidence of medical men—some of whom had been examined by parliamentary committees in this country, and whose evidence might be found in blue-books—that the result of the system pursued there was eminently unsatisfactory with regard to the health of the people living near where the works were carried on; and it was not astonishing, for no one could go into the lower parts of the town near the stream and the works without being conscious of their being eminently disagreeable, and probably unhealthy. The Italians were not particular on the subject of smells, but it was confessed that these were very objectionable. The sewage was carried over the fields, and took its course. Sometimes it was used, and in all probability, when that was the case, it passed off the ground without doing any damage to the water of the stream; but during a great part of the year such was not the fact, and the consequence was that the stream in its course was much polluted. And this was a result which he had also observed in other parts of the world. A few days previous he had the opportunity of visiting the irrigation works at Aldershot, and there it was perfectly clear to him that the farm which took the camp sewage and was working it, was utterly inadequate for the quantity put upon it, and that, from the nature of the irrigation, the sewage water carried over the fields could only be used upon a very small scale, while the greater part of it necessarily ran away into the river. He could not help thinking that in most cases this must be the result. It was not for him to say what was the right method of getting over the extraordinary difficulty which the public were called upon to face, but that some method must be adopted was evident. The question before the meeting was whether that particular method of carrying on the work suggested by the Royal Commission on the Pollution of Rivers was likely to be practically useful. As far as his own experience and knowledge were concerned, it seemed to him that the method of carrying away the sewage and utilizing it by irrigation might be successful upon a small scale, where the population was limited and the acreage was large; but he could not see much probability of its being successful upon a large scale, for what upon a small scale would practically do no harm—say in the case of 200 or 300 acres—would be attended with very serious results in the case of a large city or town. It might be very well in the case of Croydon, where the population was small, but the limits of the adaptability of the system were soon reached, and could not be advantageously extended.

Mr. Liddle remarked that in dealing with the subject they had two enthusiasts to encounter—Dr. Letheby and Dr. Frankland—whose papers were always read with attention, and probably between the two some useful information might be gathered. He was disappointed in the paper just read, because it contained very little which was of practical benefit to the meeting as a body of sanitary officers. It raised objections to the existing modes of operation, but it gave them no hint as to what could be done with the sewage, how to utilize it without creating a nuisance, and exposing the community to those fatal consequences which Dr. Cobbold had described.

Mr. Creasy thought it was necessary to explain in some degree the sort of conflict of evidence which had taken place. When Beddington was mentioned, it should be known that it was a large district, and that a portion of it had little to do with the sewage question. The sewage fields of Croydon had been well chosen with reference to population, but certainly in every cottage on the estate there had been typhoid fever through the whole course of the time—not a cottage had escaped. And as to the outfall at Beddington Corner, every well was contaminated, and not a house was free from fever. At Carshalton he had had cases of enteric attack. At Beddington Corner, near the outfall, four children had been taken out of one house in a day stricken down with scarlet fever.

Dr. Carpenter interposed the remark that the local nuisances in connection with those cottages were quite sufficient to produce all the fever complained of, without seeking a cause in the outfall sewer a quarter of a mile off.

Mr. Creasy said that might be, but the watershed went in that direction. In every one of those houses an examination of the tongues of the inhabitants would show that there was enteric irritation. The same indications which were caused by the Croydon sewage on one spot arose from the existence of cesspools on another.

Mr. Hawksley said he could fully justify the statements made by Mr. Creasy, for few persons were better acquainted than himself with the results of the irrigation works at Beddington Corner. He had been professionally called down to look at those works at intervals for many years, and also in consequence of complaints having arisen, although Dr. Carpenter stated there had been no such complaints since 1860. When on other occasions he had been in the neighbourhood on totally different business, he had taken samples of the water as it fell into the Wandle, and had them analysed. He had also been up the stream, and looked at the confluence of the two waters, which ran over the meadows in different directions. On one recent occasion he found one of those waters exceedingly clear, and the other about as foul as it could be. These two waters met, and passed down by the side of the cottages just mentioned, and thence to the Wandle. In the month of February last he was down there; the sewage was then frozen over the whole surface of the land for acres and acres, and was not in the state which Dr. Carpenter had described. But, besides that, he had been there in the summer, and in the summer it depended very much upon the state of the water whether the sewage, when passed upon the land, stank or not. In warm weather it often stank frightfully, especially on "muggy" evenings. The sewage then gave off a very sickening, though not necessarily a very powerful odour. The same sort of thing occurred everywhere when sewage was applied to land—at the Barking farm, at Edinburgh, at Aldershot, and every place he had visited. It had been stated, to his great surprise, in the course of this discussion, that at Carlisle the sewage did not stink. Most assuredly it did in hot weather, although the entire quantity of sewage put upon the enormous acreage of land there was only from 200,000 gallons a day as a minimum, to something under 400,000 gallons as a maximum, which was only one-sixth of the sewage of Carlisle. And it was there of so little value that the other five-sixths were allowed to run away into the river, though the acreage of land for its reception was sufficient to utilize the whole. As to the commercial economy of the system, he had made a great many inquiries, and he had been told very frequently of crops being sold at £18, £20, and even £25 an acre, and that every one was delighted with the effects. But when he came to ask what was the net result of the year's working, he was answered, "Ah, that is another thing." "Well, but what is it?" "Well, we lost so many hundred pounds last year," and in some cases so many thousands. There was not one single place he had heard of where the application of sewage for the purpose of sanitary disinfection was proved to be a commercial success. It was a commercial success at Edinburgh. Why? Because it was not applied for sanitary purposes. They used as much as they required for irrigation purposes, and the remainder ran into the sea or river nearly as foul as when it entered upon the land. But this was not the question now before the meeting. The question before them was one which almost every one could answer for himself. Take the case of plain irrigation by water only—pure water—water issuing, as in the majority of irrigation schemes in this country, from chalk springs. They all knew that when water was put upon land in certain seasons of the year in that state it did fertilize the land, and good grass crops ensued. But what was the result in a sanitary point of view? Fever and ague were produced. Go to Italy. He had been over all the irrigation works there, extending for 200 miles in one way, by 60 or 70 in the other, and what was the result? The people were in a state of actual decrepitude, not simply affected with fever, but with rheumatic complaints, and there was a great deal of cretinism. The same thing existed in the south of France, where irrigation by water only was adopted. Superadd to this foul organic matter, and what must be the result? He believed there was really nothing to be learned upon the subject. His own opinion was that of all unsanitary applications the most unsanitary was that of the application of sewage to land by way of irrigation.

Mr. Creasy said the Beddington grass was irrigated as long as it could stand up, and then it was sent away to market with the sewage some inches up the stem. So that if Dr. Cobbold was right, there was an opportunity for the development of entozoa there.

Dr. Letheby, in bringing the discussion to a close, said he thought Mr. Holland had not quite apprehended the statements he had made. He had said all along that sewage going into a running stream where there was abundance of vegetation, fish, and a large quantity of oxygenated water, even in the condition of sedimentary sewage, was by a natural process quickly disposed of. But what he also said was that the main cause of all those nuisances, which arose from the discharge of sewage into running streams was the sedimentary matter it contained, and that the distribution of sewage upon the land at the present time did not provide a remedy, and was accompanied by a large number of disadvantages. He said, further, that there was another means whereby these sedimentary matters could be separated; that by a process of chemical precipitation, as by lime, sulphate of alumina, or the agents employed by the A. B. C. Company, or that recommended by Mr. Blyth, they had the power to do certainly, and without danger, what they were not doing certainly when the sewage was put on the land, and with a great deal of danger. By this system of precipitation they could separate those solid elements, and could superadd agents which were not particularly injurious to the highest forms of animal life, but were deadly to those creatures referred to. There was, indeed, a mode within their reach, of dealing with those sedimentary matters which were the real cause of nuisance by accumulating in the rivers, and of rendering the water in such a condition that it might safely be admitted into a stream of eight or ten times its volume. It was a fact that in every one of the places visited, where the irrigation system was adopted, they found—whether by accident or design—abundant evidence of those evil results which it was most desirable they should seek to avoid. The system of precipitation, by chemical processes, could, however, be carried on without the slightest danger to the public, but this could not be said of any system of irrigation; for it was indisputable, from the investigations of Dr. Murchison, that sewer gases would produce sewer fever; and as these gases are abundantly evolved from irrigated land, no doubt it was a question open to a great deal of discussion how far they must be diluted before they would cease to produce dangerous consequences. He had told them what he found in his own experience at a model place—the Hebble Brook—where the inhabitants were so decimated by fever that the system was obliged to be stopped. He was asked whether the sewage then was to be wholly lost, and not utilized upon the land? He hoped he had sufficiently answered those questions by showing that the proposed mode of dealing with it was open to the objections that it was dangerous and uncertain, and that there were other and better means of dealing with it. He did not mean to say that by irrigation sewage could not be defecated, but he contended that the system required great attention, and that the result could not be realized in practice; whereas, by the adoption of chemical processes, there was a safe and certain mode of accomplishing the object, and, so far as he knew, these processes were more economical, for there was not a single instance in the country in which the utilization of sewage by irrigation had proved profitable.

On the motion of Mr. Liddle, a vote of thanks was given to Dr. Letheby for his paper, and the proceedings terminated.

Morphia Collodion. — A preparation under this name is recommended in 'L'Union Médicale,' as an application for neuralgic pain. It is made in the proportion of 1 part of hydrochlorate of morphia to 30 parts of flexible collodion, and is applied by means of a camel's-hair brush.

Reviews.

A System of Botanical Analysis applied to the Diagnosis of British Natural Orders; for the use of Beginners. By W. Handsel Griffiths, Ph.D.E. London: Wyman and Sons. 1870. Pp. 26.

This artificial key, published at the request of the author's pupils, is compiled from various botanical works, but differs from most analytical keys in being arranged *along* the pages, and having the less important characters indented from the more important. This renders it much easier to consult, and it may prove a useful aid to beginners.

Vollständige Anleitung zur Fabrikation kunstlicher Mineralwässer und der Brause-getränke, etc. etc. By Dr. Hermann Hager. Second Edition. Breslau: E. Günther. 1870.

In Germany the manufacture of aerated water and artificial mineral water is now almost entirely in the hands of pharmacists, and there is scarcely a town where they are not made. It is to provide for the wants of those engaged with such work that this book has been prepared, and the information it affords in regard to machinery, materials, and formulæ is such as to be very useful. It would probably repay the trouble of translation.

Science for the People: a Memorandum on Various Means for Promoting Scientific and Practical Knowledge among the Working Classes, addressed to Lord Henry Gordon Lennox, M.P., Chairman of the Council of the Society of Arts. By Thomas Twining, one of the Vice-Presidents of the Society. London: C. Goodman, 407, Strand. 1870. Pp. 136.

The object of this book is to consider the best means of disseminating a knowledge of domestic economy amongst the lower classes, so that they may "know how their dwellings should be constructed in accordance with sanitary principles; what household improvements they may derive from the discoveries of science, or borrow from the customs and appliances of other nations; what fabrics they should wear; what food they should eat, and how it ought to be cooked; how they may distinguish things which are genuine, wholesome, substantial, durable, and really cheap, from those which are cheap only in appearance; and, in short, how they may live with judgment, and get the best money's worth for their money." But to enable the working classes to attain to this happy state, Mr. Twining has found they must have a certain modicum of scientific instruction, some knowledge of the elements of physics, chemistry, human physiology, and natural history. This want he has endeavoured to meet by instituting at the Twickenham Economic Museum and elsewhere, short courses of lectures of the most elementary character. In this attempt he has felt the want of a sufficient staff of lecturers who could restrict themselves to giving merely outlines, and yet make them interesting and instructive. The plan he has generally adopted has been to provide written lectures, which could be read while an assistant acted as demonstrator.

Mr. Twining also urges the necessity of establishing popular museums in furtherance of his object. These museums are to contain typical collections of natural history specimens, the examples being so chosen as to illustrate as completely as possible the principles of structure and classification. Also illustrative examples of domestic economy, such as building designs, household furniture, utensils, clothing, food, etc.

This groundwork of science, especially if it becomes a part of primary education, may prove of great use in enabling the workman to master his trade, and to work from principle rather than from rule of thumb.

Although these suggestions are not intended for those whose profession renders real scientific training indispensable, yet the book will be read with interest by many, as containing the views of one of the prime movers for technical education, and the spread of a knowledge of the principles of domestic economy.

THE CULTIVATION OF THE CHINCHONAS OR PERUVIAN BARK-TREES IN JAVA. By K. W. VAN GORKOM, Superintendent of the Plantations (with Notes by C. HASSKARL). Translated from the German. London: Her Majesty's Stationery Office. 1870. Pp. 62.

The high value always placed on the curative properties of the quinine barks, has made the medical world anxious to secure continuous supplies, and the fears excited by the testimony of Weddell, Delondre, and other travellers of the reckless destruction of these trees by the Cascarilleros, or bark-gatherers, have directed attention to the desirability of cultivating them, so as not to be dependent on native sources, which may one day fail. The Dutch Government, through the representations of Reinwardt, De Vriese, Blume, Mulder, and others, gave their attention very early to this subject. Dr. De Vriese, who took a warm interest in Economic Botany, fortunately obtained, in 1851, a plant of *Cinchona Calisaya*, in Paris, which he dispatched to Java. This plant had been raised from seed collected in South America by Dr. Weddell, and became, in Java, the stock of a numerous offspring.

In the same year, also, Mr. Pahud, the Minister of State for Holland, dispatched Dr. Hasskarl to South America, to collect live plants and seeds of valuable species. Dr. Hasskarl landed at Callao, in Peru, in December, 1852, and, after an arduous journey and much opposition, obtained plants and seeds of some *Cinchonæ*, chiefly of *C. Pahudiana*, Howard, at first mistaken for *C. ovata*, Weddell.

He arrived in Java with his collection in December, 1854, and together with Dr. Teijsmann, the Director of the Buitenzorg Gardens, began the cultivation. Unfortunately, the site chosen for this operation was one having only about 6 inches of soil, and when, in 1856, a scientific staff was appointed, the plantation was not in a very successful state. The new director, Dr. Junghuhn, had associated with him Dr. J. E. de Vrij, a chemist well known for his abilities, and eight overseers. Only seventy plants were found of any value, and the plantation was removed to a more favourable situation, and while under Dr. Junghuhn's management, much better results were obtained.

Mr. Van Gorkom, the present Superintendent, reports that there are now under cultivation in Java, 840,653 plants of *Cinchona Calisaya*, 39,512 of *C. succirubra*, 159,149 of *C. Condaminea*, 812 of *C. lancifolia*, and 409 *C. micrantha*. Of *C. Pahudiana* no number is given; the last estimated number was 900,000, but its cultivation is not now particularly attended to, as it is generally agreed to be of little value.

Though the past history and present position of Cinchona cultivation in Java is not all that one could desire, yet it must be remembered that the cultivation of the *Cinchonæ* is fraught with manifold and various difficulties, and requires an almost delicate adjustment of light and shade, heat and elevation. Mr. Van Gorkom is very sanguine of the future success of the undertaking. He says that courage should be derived "from the certainty that we are on the right path, and indulge in the well-founded hope that the persevering efforts of successive Governments—efforts which have aroused a sympathetic feeling in the educated world in general, and amongst scientific men in particular—will end in glorious success." And in this hope we most heartily join in with them.

ESSAIS DE CULTURE DU QUINQUINA A LA MARTINIQUE. Par M. CH. BELANGER, Directeur du Jardin Botanique de la Martinique. Paris: 1870. Pp. 7.

In 1862, M. Belanger, having obtained some cinchona plants, began their cultivation, in order to test whether they could be successfully acclimatized in that colony. He finds that, though he has not been able to command all the elements of success desirable, yet he has experimented sufficiently to convince himself of the success of the scheme, if the French Government would undertake it. At present there are growing in Martinique plants of *C. Calisaya*, *C. lancifolia*, *C. officinalis*, *C. succirubra*, and *C. Pahudiana*,—altogether 90 in number, and ranging from half a metre to 3½ metres in height. Bark of three years' growth has been submitted to analysis, and said to yield very fair results.

THE MANUAL OF COLOURS AND DYE WARES. By J. W. SLATER. London: Lockwood and Co., 7, Stationers' Hall Court. 1870.

This book is the work of an accomplished chemist, for many years practically engaged in the special branch of industry to which it relates. It is calculated to supply a gap, the existence of which forces itself upon the attention of all men who take a rational interest in the manufactures of this country. A passage in the preface to the book before us places, in a clear light, the state of affairs in this department of literature.

"If their authors be mere *littérateurs*, or even men of abstract science, they cannot furnish all the required particulars. If they are practical men, they will not."

The book before us contains much information that is not easily accessible. The arrangement followed is *alphabetical*, and the descriptions are admirably clear. Under "Hydrometer" will be found some valuable information concerning the irregular scales in vogue.

BOOKS RECEIVED.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, Sixteenth Annual Meeting at Chicago. Philadelphia: Merrihew and Son. 1870.

DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE, No. XCVIII. Dublin: Fannin and Co.

SECOND REPORT OF THE ROYAL COMMISSIONERS ON POLLUTION OF RIVERS. London: Her Majesty's Stationery Office. 1870.

WATER ANALYSIS: a Practical Treatise on the Examination of Potable Water. By J. ALFRED WANKLYN, M.R.C.S., and E. T. CHAPMAN. Second Edition. London: Trübner and Co., 60, Paternoster Row. 1870.

JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER PHARMACOGNOSIE, PHARMACIE UND TOXICOLOGIE. By WIGGERS and HUSEMANN. 1869. Göttingen: Through Williams and Norgate.

ON DIET AND REGIMEN IN SICKNESS AND HEALTH. By HORACE DOBELL, M.D. Fourth Edition. Rewritten and much Enlarged. London: H. LEWIS.

REPORT ON THE GAS NUISANCE IN NEW YORK. By C. F. CHANDLER, Ph.D. New York: Appleton and Co. 1870.

REPORTS ON THE WATER SUPPLY OF NEW YORK AND BROOKLYN. By C. F. CHANDLER, Ph.D., and W. B. LEWIS, M.D.

LE LIVRE DES PARFUMS. Par EUGÈNE RIMMEL; Préface d'ALPHONSE KARR. Illustrations d'A. DE NEUVILLE, DUHOUSSET, CHERET, etc. Paris: E. Dentu; London: Chapman and Hall. 1870.

Obituary.

On the 17th July, at his residence, 33, St. John's Wood Park, Benjamin Brogden Orridge, Esq., F.G.S., in the 57th year of his age.

JAMES COPLAND, M.D., F.R.S.

Force of character, with geniality of temperament, unusual powers of generalization and research, with literary accomplishments of a high order, were the moral and intellectual features of Dr. James Copland, who died on the 12th inst., after a brief but painful illness, at Kilburn. The doctor was by birth an Orkney man, and first saw the light in November, 1791. His education was commenced and carried to the University stage at the town of Lerwick, in Shetland, from which, at the age of fifteen, he came to Edinburgh; and with a view to qualifying for the Church, passed through the curriculum of arts. After profiting to the full by the deep and varied culture of the Edinburgh curriculum, he abandoned the clerical for the medical career, and threw himself with characteristic energy into his chosen pursuit. Four years' assiduous attendance at the classes under the (then) efficient professoriate, qualified him to graduate as doctor in medicine in 1815, when with the instincts of so many of his countrymen, he migrated southward, and attempted to establish himself in London. He failed, however, to win immediate success, and after profiting as far as he could by the professional opportunities afforded at the metropolitan schools, he visited Paris, where he availed himself of all the advantages of her clinique. Thence he proceeded to Germany, in whose hospitals, filled to overflowing with the sick and hurt from the newly-terminated war, he was an industrious and vigilant observer. The febrile and dysenteric disorders of which he saw so much were now his chief study, and with a view to extending his knowledge of them, he took service under the African Company, and sailed for the Gold Coast. On his way thither, he touched at various settlements, such as Senegal, Gambia, and Sierra Leone, at which latter place three-fourths of the crew were stricken down with yellow fever, from which, however, his skilful and energetic treatment rescued them all but two. He was the last to be seized, but the measures which had issued so happily for his patients, were applied with equal success to himself. Powerful tonics and stimulants were the remedies he chiefly relied on, as we learn from his 'Dictionary of Practical Medicine,' in which he gives a most interesting account of the epidemic, and the mode in which he combated it. After a few months' residence at Cape Coast Castle, he returned to Europe by way of Accra and Benin, and after a brief visit to his native Orkney, he again passed through Edinburgh and London for the Continent, where he sojourned chiefly at Paris, and attended her hospitals for some months. He returned to London, and established himself at the "Terrace," at Walworth, having previously became a licentiate of the Royal College of Physicians, and physician to the Royal Infirmary for Diseases of Children.

In 1821 began his medico-literary career. He contributed to the 'Quarterly Journal of Foreign Medicine' a number of papers on fever and the medical topography of the West Coast of Africa. After applying without success in the same year for the post of Government commissioner on the origin and nature of the yellow fever then prevailing in the Spanish peninsula, he concentrated his energies on home-practice, established the South London Dispensary, and before the end of 1821, he published his celebrated memoir on turpentine as a therapeutic agent, the value of which he had been so impressed with on the Gold Coast. In the January of the following year he took the editorship of the 'London Medical Repository,' and enriched its pages with a vast number of contributions on the most various topics, from public hygiene to private or consulting practice. Most of these articles found their way, in substance at least, into his great 'Dictionary of Practical Medicine.' In 1824 he translated and edited Richerand's 'Physiology,' and threw out, in the notes, anticipations of those views on the nervous system which afterwards brought so much distinction to Dr. Marshall Hall. In 1825 he projected his 'Dictionary,' but he did not commence it till 1830, when the announcement of a rival work, supported by sixty contributors, supplied the doctor with the needed stimulus. Night and day for twenty-eight years he continued to labour at his work; and in spite of the incessant inroads made on his time by an increasing practice, he did not fail to subject every article to the most exhaustive consideration, and to embody his ripest judgment on its details in a style singularly forcible and effective. As a single-handed effort it has been compared to the Dictionaries of Bayle and Johnson; while its value, though diminished by the progress of science, will always be great enough to secure it an honoured place in the library of the physician. In its abridged form, under the able editorship of his nephew, Mr. J. C. Copland, it has renewed its popularity with the rising generation of practitioners; while many of its suggestions have been silently adopted by the sanitary reformer or incorporated with special treatises on medicine.

The doctor was unusually fortunate in the honours he received, among which we may single out his being made a Fellow of the Royal Society in 1833; a Fellow of the Royal College of Physicians in 1837; Gulstonian Lecturer in 1838; Censor of the College in 1841, 1842, and 1861; Croonian Lecturer in 1844, 1845, and 1846; seven times Councillor between 1844 and 1863; Lumleian Lecturer in 1854 and 1855, and Harveian Orator in 1857. He delivered his discourse on this latter occasion in Latin remarkable for its freshness and force,—not a cento of phrases, like the majority of such orations, but the work of a man to whom the language was almost native. For the last few years he had ceased to engage so extensively in consulting practice; and, though a constant frequenter of the societies, he fixed his residence out of town. To the last, however, he was always willing to give the poor artist or the struggling man of letters the benefit of his gratuitous advice; while to all appearance his hale and vigorous physique gave promise of a lengthened continuance of his genial and philanthropic labours. But within the first week of July his old enemy, the gout, renewed the attack; and, in spite of every medical aid, he gradually sank till the 12th, when he died, in his seventy-ninth year.

Climate of the Azores.—The Hon. E. Monson, in his consular report on the trade and commerce of the Azores, expresses regret that so few tourists visit those islands. He says they are chiefly Americans who prefer taking a southern route to Europe, and like to break the voyage by halting for a short time in Fayal; while the very few Europeans who find their way there are such as the casualties and exigencies of business compel to undertake a voyage from which they anticipate no pleasure. Thus these islands, replete though they are with objects of interest, no less to the man of science than to those who travel for mere amusement, will remain neglected until, in the process of time, the so much needed harbour improvements are completed sufficiently to encourage the visits of ocean steamers. The island of St. Michael's, he says, should be peculiarly attractive to the invalid. It is blessed with a climate equable and mild, although somewhat humid. According to careful observations, the mean temperature of the winter months is 2° colder than Madeira, 5° warmer than Lisbon, 13° warmer than Nice, 12° warmer than Rome, and 12° warmer than Naples. According to the estimate of Sir James Clark, the mean annual temperature of St. Michael's is 62° 40′, that is about 2° less than Madeira during the whole year. The mean monthly range of the thermometer during the winter is stated to be 7° 6′ at St. Michael's, against 12° at Madeira,—showing that, while the St. Michael's winter is only 2° colder than that at Madeira, it is more equable, or, at any rate, not less so. The south and westerly winds are soft, relaxing, and warm; the north-easterly are colder and more bracing, but never keen and thin. The extent of the surrounding ocean, and the mildness of the temperature, naturally cause the climate to be extremely humid; in fact, the state of the atmosphere has been frequently compared to that on board a ship at sea; but this condition of the air is not productive of disease, nor is it even a source of inconvenience to those who are in tolerable health. The native poor, who are exposed to it all their lives, and whose cottages (rarely possessing glass windows and invariably having earthen floors) are not at all calculated to resist its influence, are a healthy, robust, and handsome race. Neither cholera nor yellow fever has ever visited the islands, and epidemics of any kind are almost unknown. Owing to the same causes which produce the humidity, a cloudless sky is very rare; and this adds considerably to the advantages of the Azores as a place of residence for an invalid, as the direct heat of the sun does not prevent a person in delicate health from spending the greater part of the day in the open air. Added to these advantages there are wonderful mineral springs with which Madeira has nothing to compete. The striking volcanic conformation of the islands is worthy of the study of geologists, and the magnificent scenery would afford endless opportunities to the artist; yet, Consul Monson adds, even to the inhabitants of the mainland of Portugal they remain almost a *terra incognita*, while to the world at large they are as remote and mysterious as were the Hesperides to the civilized world in the classic days of Greece and Rome.—*Pall Mall Gazette.*

Hay-Asthma.—A correspondent in the 'Lancet' reports the case of a patient who has for several years suffered from this malady, but found no permanent relief from any of the usual remedies. The following treatment, however, proved efficacious:—A small barrel of sea-weed, taken fresh from the shore, was given to the patient to sniff whenever an attack came on. Five minutes' inhalation of the sea-weed sufficed to stop the symptoms, after which the barrel was securely closed, and placed in a cellar for future use. It is suggested, that the active principle of the sea-weed should (to obviate the cumbrous device of the barrel) be concentrated, like salts, in a smelling-bottle; and this idea has been carried out with success. Such a pocket-companion might prove serviceable to those whose liability to hay-asthma is not proof against the odour of the flowers which decorate dinner-tables and drawing-rooms. Sea-weed should be brought up fresh from the shore by rail, and kept for use in hospitals where strumous affections are treated,—an application of the *inutilis alga* which might be of benefit to other patients, who would fain, if they could afford it, "suffer a sea-change."

Granular Citrate of Magnesia (effervescent).—H. C. Archibald gives the following formula:—

Take of Acid. Citric.	. .	4 lbs.
Magnesiæ Calc.	.	1½ „
Sodæ Bicarb.	. .	3 „
Acid. Tart.	. . .	3 „
Pulv. Sacch. Alb.	.	6 „
Ol. Limon.	. . .	1½ fl. oz.
Alcohol Fort.	. .	q. s.

Powder the citric acid and add the sugar: mix thoroughly, then add the soda, magnesia, and tartaric acid. Pass the whole through a No. 40 sieve three times; moisten with strong alcohol and pass through a No. 8 sieve; place it on a wooden tray to dry, then add oil of lemons and bottle instantly. It usually takes twenty-four hours and a temperature of 120° F. to dry the salt perfectly.—*American Journal of Pharmacy.*

Brown Hair Dye.—The hyposulphite of lead, dissolved in excess of hyposulphite of soda, forms a hair-dye which gradually becomes brown from absorption of oxygen and deposit of sulphuret of lead on the hair. The following formula for the preparation of this dye, is given in the 'American Journal of Parmacy:'—

℞ Acetate of Lead	. . . .	ʒij
Hyposulphite of Soda	. .	℥j
Rose (or other Perfumed) Water	. . . . . .	℥xiv
Glycerine	. . . . . .	f℥ij:

Dissolve the acetate of lead and hyposulphite of soda in separate portions of water, filter separately, mix the solutions, and add the glycerine.

Death from Escape of Gas.—An inquest was held last week, at Haverstock Hill on the body of Charles Lawley, aged sixteen, son of a reporter on the 'Field,' who was found on Wednesday suffocated in bed. The gas-burner in deceased's bedroom was found broken off from the joint, and the room was full of gas. How the joint got broken off is unknown. The jury returned a verdict of "Accidentally suffocated with gas."—*Standard.*

[*⁎* Probably the cause of death was poisoning by carbonic oxide, which exists abundantly in gas; ethylene, which likewise occurs, is very poisonous.—Ed. Ph. J.]

Eucalyptus Oil.—The essential oil of eucalyptus now being introduced into use in perfumery by Mr. Rimmel, has lately been examined by Cloetz. He took the product of *Eucalyptus globulus*, originally a native of Tasmania, where it was discovered by Labillardière, in the year 1792. It has since been acclimatized on the shores of the Mediterranean. From 10 kilogrammes of fresh leaves of the plant, 275 grammes of the essential oil were obtained by distillation with water. In another experiment about double the quantity of oil was obtained. The oil is very fluid, almost devoid of colour, and having a smell analogous to that of camphor. It begins to boil at 170° C., and rises in boiling-point as the distillation proceeds, until above 200°. The more volatile liquid, after purification with caustic potash and with fused chloride of calcium, boils regularly at 175° C.,—this is eucalyptol. Its specific gravity at 8° C. is 0·905; it deflects the ray of polarized light to the right; it does not freeze; its vapour, mixed with air, is fresh, agreeable when inhaled, and has been employed as a therapeutic agent; it is hardly soluble in water, but very soluble in alcohol; its alcoholic solution, when highly diluted, is said to afford a perfume equal to the rose. The composition of eucalyptol is represented by the formula $C_{12}H_{20}O$ (vapour density 6·22). By the action of anhydrous phosphoric acid upon it, a liquid hydrocarbon of the formula $C_{12}H_{18}$, and named eucalyptene, has been obtained. This liquid boils regularly at 165° C., and has a sp. gr. of 0·835 at 12° C. Its vapour density is 5·3. It is derived from eucalyptol by the loss of the elements of water. At the same time a polymer of eucalyptene is produced. This liquid boils at temperatures above 300° C. Decomposition of the substance at the high temperature required for the determination of its vapour density, prevented a determination of that important datum. The name eucalyptolene is proposed for it. The behaviour of eucalyptol towards hydrochloric acid gas is very interesting. Cooled to zero and then treated with a current of dry hydrochloric acid gas, it absorbs the gas abundantly and solidifies to form a mass of crystals. Very soon, however, these crystals undergo spontaneous decomposition, and are resolved into an aqueous solution of hydrochloric acid and a hydrocarbon, boiling about 168° C., and apparently identical with eucalyptene. In chemical history, therefore, eucalyptol resembles camphor, of which it appears to be a homologue—two steps higher in the series.—*Répertoire de Pharmacie.*

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, *17, Bloomsbury Square.*

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

BETTS' SUITS.

Sir,—The report of "Betts' Suits," contained in your last number, is very complete and accurate; still, for those who are not acquainted with the commencement of these prosecutions, the part I played in this affair remains somewhat obscure, and I hope you will allow me to give the following explanations to your readers, without any reference or prejudice to the action still pending between Mr. Betts and myself in the Court of Chancery:—

Since I commenced using capsules at my London manufactory, I procured them from three different makers,—Dupré, of Paris, the original inventor of metallic capsules; Courdouzy, of Bordeaux, and Espinasse, of Paris. These capsules were sold me as being made of tin, or alloys of tin, and never having had any warning from Mr. Betts as to an alleged infringement of his patent, I never dreamt they could be made of his metal. I was, therefore, much astonished at being served with a Bill in Chancery by Mr. Betts in April, 1865, without the slightest previous intimation. I naturally turned to those who had supplied me, and inquired what was the material of the capsules they had sold me. Dupré and Courdouzy made affidavits that they were not composed of the metal patented by Mr. Betts, and these affidavits were confirmed by chemical analysis made by Dr. Odling and Dr. Redwood. Mr. Betts himself tacitly acknowledged the truth of Dupré's declaration, by withdrawing, at his own expense, a Bill he had filed against Mr. Fisher, of Leadenhall Street, for selling a bottle of my toilet vinegar with a capsule bearing that maker's name.

Espinasse alone admitted that the capsules he had supplied me with were made of the metal patented by Mr. Betts, although his billheads bearing the words, "Fabrique de Capsules en Etain" (Tin Capsule Manufactory), had led me to suppose that he sold nothing but *tin capsules*. He added, that he worked under a licence of Mr. Betts, but when I asked him to produce it, and thus take the blame on his own shoulders, as he had never informed me of that circumstance whilst supplying me, he refused to interfere, saying he would do nothing against Mr. Betts's interest.

Now it turns out, on cross-examination of Mr. Betts, in the suits just tried, that the house trading in Paris under the name of *Espinasse*, was, in reality, the property of Mr. Betts, Espinasse being only his foreman,—so that Mr. Betts actually supplied me *himself* with the capsules which he called afterwards an infringement of his patent; and not only did he supply me, but he forwarded capsules from the same house direct to my London manufactory, so that even the poor plea of *Betts the Frenchman* and *Betts the Englishman* falls to the ground.

As I said before, Mr. Betts filed his Bill against me in April 1865, and, three months after, whilst negotiations for an amicable settlement were going on, he issued his batch of Bills against my customers without any previous warning to them or to me. You may judge how surprised I was at seeing him thus seek his remedy on both sides. The first three persons who came to complain to me of having been served (all in one day), I consoled with the assurance that I should see them through, but when I heard that twenty-five bills had been filed all at once, and that there were many more in the course of preparation, I offered Mr. Betts One Thousand Pounds to put a stop to this system of prosecution which was calculated to ruin my trade. This sum he at first accepted, and afterwards declined. It was then that meetings were convened, and a Defence Fund was subscribed.

I hope that the foregoing statements will suffice to establish the two chief points which I wish to impress on your readers; firstly, that I used proper caution in the purchase of my capsules, and was the victim of a deception which could not be foreseen; secondly, that I spared neither trouble nor expense to protect my customers, unconscious as I was of having done any wrong.

I remain, Sir, yours respectfully,
E. RIMMEL.

London, July 12, 1870.

NAVY DISPENSERS.

Sir,—The members of the Pharmaceutical Society, and the readers of your Journal generally, must have been at least pleased with the congratulation offered to them in your article upon the action of the Government in respect to dispensers and assistant-dispensers in naval hospitals at home and abroad.

That medicines in naval hospitals should be compounded and dispensed by hands as skilful, and directed with the same education as those required by civil communities, there can be no question; but, I think we may fairly ask in how far the naval service is likely to become popular, or an object of ambition? and also what class of candidates the Admiralty will be likely to obtain for the remuneration they offer?

The claims of Pharmacists to recognition as members of a profession have long been admitted, and by the determination of the Government as regards the navy dispensers another step is gained; but this advance becomes undesirable in proportion as the recognized position is made the excuse for inadequate remuneration.

It is to be feared that the very imperfect knowledge, founded upon a baseless tradition as to the value of drugs, entertained by the public, and the ignorance that exists as to the disproportion of the remuneration to the responsibility incurred by the retail druggist in every prescription he dispenses, may have, in some measure, guided the Lords of the Admiralty; and it would have been very desirable if the remarks of Mr. R. W. Giles and Mr. Walter Powell, on the subject of the relation of remuneration to Pharmaceutical responsibility, published in the 'PHARMACEUTICAL JOURNAL,' s. s., vol. x., could have been laid before the Lords Commissioners at the time they considered their scale of salaries. It is not, however, too late for the professional Pharmacist to press his claims with the Admiralty still further, but he ought to be supported by the body of his profession.

In order to establish the professional position of the Pharmacist, the myth of the value of the materials employed must be swept away, and an adequate remuneration demanded by the retail druggist for skill and labour bestowed.

Mr. Walter Powell, in reiterating* the sentiments expressed by Mr. R. W. Giles† in the highly important letter he addressed to the Norwich Conference, gives it as his opinion that "the hope of better days, when the Pharmaceutist shall be regarded as a member of an honourable profession, rests upon the excision and abandonment of all illegitimate departments of his business, and a more exclusive devotion of time and talent to his true profession." He remarks further, "that, to do this, considerable augmentation must be made in charges, which cannot longer be based upon the intrinsic value of medicines, nor upon the time occupied in their dispensing, but on the knowledge which enables the dispenser faithfully to further and interpret the wishes of the physician, thus rendering the former responsible trustee of the public weal."

Again, Mr. Giles clearly exemplifies the sacrifice of social status resulting from the association of a general trade with the special business of dispensing, and he shows that vending of perfumery, hair washes, and the like, must remain a more profitable, as it is a less responsible employment for the qualified assistant, whose services it is necessary to engage, so long as the claim for skill, on the part of the professional dispenser, is unrecognized and inadequately remunerated.

It is something to have established a claim to Government recognition, but it must not be forgotten that responsibility is engrafted on to, and inseparable from a recognized position; and that, therefore, a claim for remuneration commensurate with the responsibility must be established too. A qualified assistant can earn five shillings a day, and more, without the responsibility attaching to the navy appointment. Why then should he gratuitously undertake the responsibility? The very education the qualified dispenser has obtained is an investment, the bare interest of which, at least, is reasonably due to him in addition to salary, while the latter ought to be very considerably in advance of that of an ordinary artisan.

* Pharm. Journ. s.s. vol. x. p. 313. † *Ibid.* p. 160.

By now making a stand and demand for their just due, Pharmacists, on entering Government employ, may materially strengthen their position, and further their claims to consideration as a professional body. Now is their opportunity, it seems a golden one, and the embracing of it cannot too strongly be encouraged. It will indeed be a pity if the new field for service now opened is allowed to become a refuge for the destitute, and I sincerely trust that the subject will at once be taken up by those who have it in their power to further the end in view.

I am, Sir, your obedient servant,

J. T. D.

London, 18th July, 1870.

Citrate of Magnesia.

Sir,—I perfectly agree with Mr. Rimmington, that this salt is often badly manufactured; but I differ from him in considering the use of sugar as promoting deficiency of carbonic acid in the carbonate of soda. The sugar exercises no chemical action whatever on the salt. It is simply used for two objects: one, to give adhesion to the granules, and the other, to impart a zest to the draughts made from the citro-tartrate of soda, *alias* citrate of magnesia. It is owing to the chemical action which takes place on the addition of the acids to the alkali, with a small quantity of water, used for damping, that the bicarbonate loses part of its carbonic acid. This is absolutely unavoidable, so long as the crude and destructive method of damping the acids and alkali together is adopted. The carbonate of soda also parts with some of its carbonic acid during the process of drying. This additional loss might be prevented, if a proper degree of heat were applied during the granulation. The manufacture of citrate is generally intrusted to mere laboratory porters, who have no knowledge whatever of the influence of heat upon chemical compounds, or the degree requisite in particular cases. To expedite their work, they apply an excessive amount of steam to the drying-pan. As this salt is fast displacing the ordinary seidlitz powders, it is to be regretted that its manufacturers still pursue their ordinary and destructive method. A better product might be obtained by damping the acids and alkali separately, and applying a proper degree of heat in granulating. Another point worthy of remark is the fact, that nine-tenths of the people who use the citro-tartrate, generally put the water into the glass first, and the salt upon the surface. The salt ought first to be placed at the bottom of the glass, and the water poured upon it. No directions of this nature are given on the manufacturer's labels.

J. Hughes.

High Street, Cheltenham, July 15th, 1870.

Anonymous Writing.

Sir,—I mean to append my name to this letter, and therefore may, even by those who object to anonymous writing, the subject having "cropped up," be allowed to say a few words in favour of it.

First, however, I agree that—

Nothing personal, or at all affecting injuriously the moral character of private individuals, should be admitted in print without the name of the writer;

Nor any *general* attack be permitted to be so made upon the motives or capabilities of any person or society, public or private.

There may also be this further objection taken by editors of periodicals to anonymous letters, that, being without a name, they may be necessitated to do what they have hardly time for, *i. e.* read them *through* carefully.

But this one great advantage—of an essay relying solely upon its own merits, unaided and unobscured alike by the addition of a well-known or of an unknown name—can be secured *in no other way* than by anonymous publication.

I do not know, nor care to know, how often a novel idea, an unpopular sentiment, or individual partiality or dislike, may have consigned a well-written and telling article to the waste-basket, because unintroduced and unrecommended by a name, but it needs small knowledge of human nature to feel assured that this must often be the case. And who knows not the power of a name to give currency and weight to the dullest mediocrity?

Let me suppose—I am sure these gentlemen will pardon the supposition—that it were possible for a Redwood, an Ince, or a Squire to write nonsense; would a communication signed by one of them be either refused insertion on this account, or operate as fairly upon the mass of readers as it would if unweighted by the influence of an eminent name? On the other hand, it is next to impossible impartially to criticize and examine in print the demerits of such a production otherwise than anonymously. Men usually, if not always, require the stimulus of a sense of personal affront or injury—of private or public animosity—to stir them up to array themselves in open antagonism to a high reputation or deserved eminence. Yet those who have attained both may err, and if they do, their very superiority only makes it the more needful that errors upheld by commanding influence should be impartially exposed, without fear and without favour. Import, however, the element of personal feeling, and farewell to anything like fair criticism, or cool and impartial judgment.

This one consideration alone (there are others) should, I think, arrest in some degree the tide of this present, almost universal, crusade against anonymous correspondence in public prints, and moderate the zeal of those who engage in it, and, at the same time, desire not merely to give, but to listen to, unbiassed opinion.

Politically, I am not afraid of the ballot, but I conceive that question to rest on an entirely different basis. I am not here advocating the moral cowardice of hiding one's name from fear of personal consequences, but the advantage which would accrue to the cause of truth from the absence of suspicion of personal interest or motive on the one hand, and on the other of a fair and free investigation of facts and arguments.

Of two kinds of anonymousness (I must coin the word), —that in which the correspondent's name is unknown even to the editor he addresses, and that which conceals it from the public only,—I am here treating chiefly of the former. And I will go the length of saying, that if a writer of note wishes to ascertain his own true weight in the scale of public estimation, or whether he has gained or lost ground in an opinion which he values, he should occasionally, not only only omit his name, but likewise employ an amanuensis.

I am, Sir, yours respectfully,

Thomas Lowe.

Liverpool, July 18th, 1870.

George B. Clarke (Woburn).—

1. Entry is not necessary in the cases mentioned, neither is the signature of the purchaser required by the Act.

2. The articles referred to are not included in both Parts of the Schedule, but only in Part I. Part II. refers to Tinctures, and all vesicating liquid preparations of Cantharides, or preparations of Corrosive Sublimate. It is only necessary to label these.

3. No.

R. Jones Owen.—The book referred to has not been received.

R. R. (Leighton Buzzard) wishes "Echo" to favour him with the correct rendering of the sentence criticized at page 60 of the last number.

C. Brook, jun. (Southville) inquires if a 'Flora of Hampshire' is to be procured; if so, where and at what cost?

Label (Maidenhead) shall be answered by post.

A. Z. (Liverpool) will find some information in chapter 8 of 'The Practice of Perfumery.'

E. B. S. (Norwich) wishes to learn who is the maker of "Symond's Ale Preserver."

J. R. M. (Witham) should write to the Secretary of the Royal College of Surgeons, Lincoln's Inn Fields.

R. J. (Southport).—1. Next week. 2. The *o* is short in the word podŏphyllin.

A Country M.P.S.—If the writer will favour us with his name and address, we will write to him.

M. P. S. (Liverpool).—The dose is large, but, failing to see the prescriber, we think it might be dispensed with safety. The case was probably that of hæmorrhage.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W.*

ALCOHOLIC FERMENTATION.

BY BARON VON LIEBIG.

(*Continued from p.* 64.)

Pasteur thinks that in the fermentation of yeast the cellulose of the old mother-cells is converted into sugar, part of which is consumed in the formation of the cell-membrane of the young sprouts, while another part must be converted into alcohol, carbonic acid, succinic acid, etc. This view might be readily tested by determining the cellulose and the alcohols. In the same proportion as alcohol was formed cellulose should disappear.

I have endeavoured to prepare cellulose from yeast by Schlossberger's method,* but I have not succeeded in obtaining it quite free from nitrogen. I did not obtain more than 17 per cent. from the yeast, generally less. Pasteur found in three experiments 17·77, 19·29, and 19·21; mean, 18·76 per cent.

The determination of the alcohol is not difficult.

The yeast used for this purpose was bottom yeast; it was washed with water, and separated by means of a fine sieve from the remains of hops and beer. What passed through the sieve was allowed to settle; the deposit, mixed with ten times its bulk of water and repeatedly washed with fresh water by decantation, until the supernatant water was no longer coloured. After this treatment the yeast presented no foreign cells when examined by the microscope.

As already mentioned, the fermentation of yeast takes place most freely at 30° or 35° C., and after thirty-six hours there is no further evolution of gas. A temperature of 60° C. kills the yeast-cells; after exposure to this temperature in water, they no longer undergo fermentation, and do not cause fermentation in sugar solution.

I. 1500 c.c. moist yeast, = 147 grm. dry yeast, gave, after eighteen hours, 14·792 weak alcohol, 0·8472 sp. gr. = 11·981 alcohol.

II. 1200 c.c., = 48·81 grm. dry yeast, gave, after thirty-six hours, 6·188 alcohol.

III. 1200 c.c., = 91·5 grm. dry yeast, gave, after twenty-four hours, 8·23 alcohol.

IV. 1000 c.c., = 79·22 grm. dry yeast, gave, after eighteen hours, 6·66 alcohol.

V. 1000 c.c., = 100·58 grm. dry yeast, gave, after thirty-six hours, 13·9 alcohol.

Reducing the alcohol obtained in these five experiments to cellulose, for comparison with the cellulose contained in the yeast taken, the following results are obtained:—

	Yeast.	Cellulose.	Equivalent alcohol.	Alcohol obtained.	Percentage of the cellulose.
I.	147·0	27·57	15·7	11·98	76 per cent.
II.	48·8	9·16	5·2	6·18	118 „
III.	91·5	17·16	9·7	8·23	87 „
IV.	79·22	13·85	7·8	6·66	85 „
V.	100·58	18·86	11·26	13·90	120 „

In these calculations, Pasteur's determination of the amount of cellulose has been adopted.

It will be seen that the amount of alcohol obtained was greater in proportion to the duration of the fermentation.

If this alcohol were formed from the cellulose of the yeast cell-walls, all the cells should have disappeared in the experiments II. and V.; but it was evident that the cells were not reduced in quantity, and that they do not disappear.

* Ann. Ch. Ph. vol. li. p. 205.

The cellulose was determined in the deposit from experiment V., and it amounted to 11·75 grm., independent of loss in the operation.

According to the microscopic examination by Prof. Nägeli, "the cells of yeast that has been fermented without sugar exactly resemble in form and size the cells of ordinary yeast; they differ from them in so far that they do not sprout any more, in having coarser and thicker cell-membrane, in their granular and reduced plasma contents,"—they are, in fact, dead cells, and the process of yeast fermentation consists in the destruction of the cell contents. During this fermentation there is no perceptible smell of putrefaction.

The liquid obtained by washing the fermented yeast, gives, on boiling, a coagulum similar to albumen: baryta water produces a precipitate of phosphate: mixed with alcohol as long as it is rendered turbid, a syrupy mass separates, and after the alcohol is removed, the clear, yellow, supernatant liquid deposits crystals which consist of ordinary leucin.

The substance precipitated by alcohol is highly nitrogenous and contains sulphur. The residue (consisting of dead cells) washed and dried, is a brown, tough mass, containing on the average 5·64 per cent. nitrogen and ·493 sulphur. The first yeast contained 7·4 per cent. nitrogen or 1·76 per cent. more than the fermented yeast. It is evident, therefore, that in the fermentation of yeast, its nitrogenous constituent undergoes decomposition; the greater part of it becomes soluble and part remains in the yeast cells. Weak potash solution dissolves out of them a substance similar to casein, but containing only 11·39 per cent. nitrogen.

It is clear that if it is not the cellulose of the yeast which yields material for production of alcohol and carbonic acid, these must originate from a substance analogous to sugar and constituting part of the cell contents. Moreover, since this substance cannot be extracted by washing the yeast, it must be in the state of a fixed compound with some other substance in the cell which contains nitrogen and sulphur.

Reducing to sugar the alcohol obtained in experiment V., it represents 27 grm. ($C_{12}H_{12}O_{12}$), and adding this to the cellulose in 100 parts of yeast the sum of the non-nitrogenous constituents would be 45·6 according to Pasteur, or 43·5 per cent. according to my determination of cellulose. Hence there would remain 54·4 or 56·5 per cent. nitrogenous substance, containing 7·41 nitrogen, corresponding to 13 or 13·5 per cent. nitrogen in this substance, about 1·5 or 2 per cent. less than in the albuminates. Considering that yeast must contain less than 16·5 per cent. of pure cellulose, with some solid and liquid fat, and a bitter, resinous substance, probably derived from hops,* there would be no great error in assuming that in yeast the substance containing nitrogen and sulphur is either an albuminate or one closely related: there can be no doubt that it originates from an albuminate.

There is, I believe, no difference of opinion as to the behaviour of yeast in beer wort; so soon as perfect yeast-cells have been formed, the decomposition of sugar commences, and at the same time the formation of yeast goes on incessantly until all the sugar is decomposed.

As already mentioned, the breaking up of sugar is

* Schlossberger, *op. cit.* p. 198.

accompanied by a decomposition of the cell contents, from which a nitrogenous substance is dissolved by the fermenting liquid. This liquid loses nitrogenous constituents if these become part of the cells, and it again receives some by the decomposition of the cell contents.

So far back as 1853, Graham, Hofmann, and Redwood ascertained that a hopped wort of pale malt, containing ·217 per cent. of nitrogen before fermentation, contained only ·134 per cent. after fermentation, so that only ·083 per cent. of the nitrogen remained in the yeast, the rest remaining in the fermented liquid. The numerous nitrogen determinations in beer by Feichtinger,* etc., showed a constant, and on the average, larger amount of nitrogen in Bavarian beer.

According to experience in brewing, the yeast added for setting up fermentation is increased eighteen or twenty-fold, or there is obtained from 1800 to 2000 parts for each 100 parts of pasty yeast.

In the fermentation of sugar with yeast there cannot be any increase of yeast, for there is no substance containing nitrogen and sulphur to serve as food for the yeast-cells. Pasteur has formed a peculiar opinion respecting this process. He says, "If this matter be examined more closely, it will be evident that in the fermentation of sugar in the presence of albuminates there is *not more, but rather less yeast formed* than in the fermentation of pure sugar solution." If increase of yeast means addition and multiplication of the yeast-cells, this assertion of Pasteur's is perfectly unintelligible and inconsistent with the facts ascertained by himself. In one of his experiments he added 20 c. c. of an aqueous decoction of yeast, containing ·334 nitrogenous substance, to a solution of 9·899 grm. sugar, and then added a trace of yeast. After the fermentation had ceased, this yeast had increased to ·152 grm. of dry yeast. If this trace of yeast weighed 2 milligrams this increase would be about seventy-sixfold, or 100 parts of yeast would have given 7600 parts.

In his experiments with sugar-water and yeast† 100 grm. of sugar was fermented with 4·625 grm. yeast, and the yeast weighed, after fermentation, 3·230 grm., having lost 30 per cent. In another experiment 100 parts of yeast were reduced to 91 parts.

Comparing the increase of weight in the first mentioned experiment with the other, in which it was only 42 per cent., the large difference appears remarkable, and the cause of it is easily intelligible, for in the former case there was a substance present that served for the increase and propagation of the yeast-cells, while in the other case the fermentation took place in pure sugar solution.

By increase of yeast nothing else can be understood but multiplication of yeast-cells, and this presupposes the presence of a nitrogenous substance for the production of their nitrogenous contents. It is, therefore, impossible to suppose, that in the fermentation of sugar with yeast there can be any multiplication of active yeast-cells, and any increase of weight must be due to some other cause.

However, Pasteur adopted entirely different assumptions for establishing his statement. When a fermented sugar solution is evaporated to dryness, and the residue treated with alcohol and ether, there remains a nitrogenous substance whose constituents Pasteur regards as originating from the yeast. He describes it as the "soluble part of the yeast that passes into solution during the fermentation," and he considers that it must be added to the yeast remaining after fermentation, in order to ascertain the actual increase of weight.

It is in this way that he makes the dissolved contents of the fermented liquid in the experiment to amount to 2·320 grm., and adding this to the yeast residue = 3·230 grm., obtains 5·550 grm. as the total quantity of yeast, or ·934 grm. more than the quantity taken at first. In this way he makes the deficiency of 33 per cent. appear as a surplus of 20 per cent. It is quite true that the liquid, after fermentation, contains in solution a nitrogenous substance that must have originated from the yeast; but the whole of the residue obtained by evaporating this solution cannot be regarded as originating from yeast, and Pasteur has himself given the most convincing proof of this.

In the fifth section of his Memoir, headed "*Succinic Acid, Glycerine, Alcohol, and Carbonic Acid are not the only Products of Vinous Fermentation*," he describes an experiment in which he fermented 100 grm. of sugar with yeast, and then determined the succinic acid, glycerine, and extractive material. The yeast taken weighed 1·198 grm.; the extract (free from succinic acid and glycerine) 1·130 grm., and the remaining yeast 1·700, so that the extract weighed only 68 milligrams less than the yeast taken. Therefore, it is self-evident the greater part of this extract could not have been derived from the yeast, otherwise there would not have been any yeast left after the fermentation, while, in fact, there was more than the quantity taken at first.

The experiments of Graham, Hofmann, and Redwood may also be considered in reference to Pasteur's observations, as furnishing additional evidence that the greater part of the residual extract does not originate from yeast. They mention that in the fermentation of sugar, however far it is pushed, there is formed, besides alcohol and carbonic acid, a peculiar substance; this is the case with pure sugar solutions as well as with beerwort. A solution of cane sugar mixed with 1½, 3, and 6 per cent. by measure of liquid yeast gave, after fermentation, 4·4, 3·72, and 3·7 per cent. of that substance, the characters of which resembled those of glucic acid or caramel. It was not susceptible of further fermentation, and presented the appearance of a dark brown syrup, with a bitter and rather acid taste. Though a mixture of various substances, it did not contain any dextrin or sugar, but precipitated suboxide when boiled with an alkaline solution of copper. It is true these residues were not washed with alcohol and ether before weighing; but comparing their weight with the quantities of yeast taken in the different experiments, it is evident there is no relation between the two; with two or three times as much yeast, there was no more extract than where the smaller quantity was taken, and it must be remembered that neither succinic acid nor glycerine reduce alkaline solution of copper. Consequently, it is not admissible to regard the extractive material contained in a fermented liquid as being derived from the yeast, and to take it into account as residual yeast as Pasteur does.

In a saccharine solution containing nitrogenous and sulphuretted material suitable for the food of

* Ann. Ch. Ph. vol. cxxx. p. 227.
† Page 491.

yeast fungus, the number of active yeast-cells is sometimes increased a thousandfold and more, while the amount of nitrogenous substance in the solution decreases. During the fermentation of a pure sugar solution mixed with yeast, the liquid extracts some nitrogenous material from the yeast. In this way the efficacy of the yeast is reduced, and when a further quantity of sugar solution is added, less sugar is decomposed. I have found that if the yeast remaining after fermentation of sugar solution be washed with water before adding it to fresh sugar solution, it ceases to produce fermentation after this has been done twice. When it is not washed each time, it causes very slight fermentation in the fifth quantity of sugar, but is then exhausted.

Consequently, in regard to the formation and multiplication of yeast-cells, there is a difference between the fermentation of sugar solution with yeast and the fermentation of saccharine solutions containing nitrogenous material applicable as food for the yeast fungus. Pasteur's statement, that in both cases there is an equal production of yeast, is destitute of any foundation in fact.

Like Pasteur, I have found that when 1000 c. c. of a 10 per cent. sugar solution is mixed with 15 or 20 c. c. of moist yeast, containing 3½ to 5 grm. of dry substance, the weight of the yeast remaining after the fermentation is less than that of the fresh yeast taken. In this case the fermentation is very rapid and violent, the liquid becoming clear within three or four days. So long as the turbidity continues, this may be regarded as a certain indication that fermentation is still going on.

My experiments further confirm Pasteur's observation, that when sugar solution is mixed with less than the above proportion of yeast, the weight of the yeast, after fermentation, is not less but more than at first. This increase is from 5 to 12 per cent. by weight. The cause of it has been discussed by Pasteur, but I believe definite evidence can now be furnished that it is due to the remarkable circumstance, that the nitrogenous material extracted from the yeast during fermentation may itself serve as food for the production of new yeast-cells. In that case, it is easily intelligible that the yeast should increase in weight. At the commencement of the fermentation, and for some time afterwards, nitrogenous material is extracted from the cell-contents of the yeast by the liquid still rich in sugar. The residual living yeast behaves to this liquid like fresh yeast that has been added to beerwort,—it sprouts and forms new cells which consume the dissolved nitrogenous material in reproducing the originally active cell-contents. Then, inasmuch as these new cells act upon sugar, there is again a separation of nitrogenous material, and this may continue to go on for months.

The formation of new cell-membrane goes on parallel with the production of new cells, and, since that consists of cellulose, the weight of the yeast is thus increased, while, at the same time, its relative amount of nitrogen decreases. The process just described may be made apparent if a litre of 10 per cent. sugar solution be completely fermented with 15 c.c. moist yeast paste. If the clear liquid above the remaining yeast be filtered two or three times through a double filter, there will not be any trace of organized substance recognizable in the liquid. By boiling this for some time to remove alcohol, there remains 450 or 500 c.c., containing the nitrogenous substance that has been separated from the yeast in the fermentation. If some 30 or 40 grm. of sugar be dissolved in the liquid, and, after cooling to 20° C., a trace of yeast* added to it, the whole being left in a small closed flask, fitted with a discharge-tube for gas dipping into water, it will be found that, after ten hours, there is distinct evolution of gas and a sensible deposit of yeast. The discharge of gas constantly augments, and after three or four days the yeast produced will amount to 450 to 600 milligrams in the pasty condition. After eight or ten days, the whole of the sugar will have disappeared. By repeating the same series of operations with this liquid the process is again repeated, and in this way I have succeeded in producing yeast of perfect activity four times successively in the same liquid. This yeast behaved towards sugar solution yeast in the same way as fresh yeast.

The only precaution necessary for succeeding in this experiment is that, after the end of each fermentation, the filtered and evaporated liquid must be exactly neutralized with carbonate of potash, to prevent its becoming too acid.

The slow progress of the fermentation when there is only a small quantity of yeast, or what is known as the after fermentation, is due to the circumstance that, while the nitrogenous and sulphuretted material transferred from the yeast-cell to the liquid in consequence of the metamorphosis taking place there, has not in itself the power of converting sugar into alcohol and carbonic acid. It nevertheless acquires that power again; this happening by its serving as material for the production of new yeast-cells, and assuming in the cells that state of combination in which it produces decomposition of sugar.

During fermentation a separation of the nitrogenous cell-contents takes place; one part remaining in the exhausted cell in an insoluble state, and that is the reason why the action of the yeast is limited. If all the nitrogenous constituents were separated from the cell, and they had the capability of serving again for the production of new cells, the process of fermentation would be a true perpetual motion.

The cases of fermentation of sugar solution with washed beer-yeast, described above, constitute a tolerably good representation of all similar kinds of fermentation. With a certain proportion of yeast, the fermentation is rapid, and the yeast decreases in weight; with a very small amount of yeast, the fermentation is slow, and may last for months or years, as in the after fermentation or maturing of wine, and in this case there is an increase in the quantity of yeast.

It is conceivable that in both cases the process is the same, and that the difference is due merely to the quantity of yeast; but if the continued formation of cells were a necessary condition of rapid fermentation, then the number of cell vessels and the weight of cellulose should increase in the same ratio, as in the slow fermentation, while the fact is that the yeast decreases in weight in rapid fermentation.

Disregarding mere opinions our actual knowledge of yeast and of its action is limited to the following:—

1. Yeast consists of plant-cells, that develope and multiply in a liquid containing sugar and an albuminate, or some substance derived from an albuminate. The chief mass of the cell contents consists of a

* For this purpose a piece of pasty yeast, the size of a pin's head, is mixed with 10 c.c. water, and of this 1 c.c. is taken.

compound of some substance containing nitrogen and sulphur with a carbo-hydrate or sugar.

From the moment when the formation of yeast is complete, and when it is left in contact with water, there is a molecular motion which takes place, and manifests itself by the transformation of the cell-contents. The carbo-hydrate (or sugar) contained in the cells is converted into alcohol and carbonic acid, while a small portion of the substance containing nitrogen and sulphur becomes soluble, and communicates to the liquid its own molecular motion, in consequence of which it has the power of converting cane-sugar into grape-sugar. In this process no other substance takes part besides water.

When cane-sugar is added to a mixture of yeast and water, it is first converted into grape-sugar, and the particles of sugar, penetrating the cell-membranes, behave in the same manner as the sugar or carbo-hydrate that is a constituent of the cell-contents; they are converted into alcohol and carbonic acid (or succinic acid, glycerin, and carbonic acid), —or, in other words, the sugar undergoes fermentation.

Up to the present time there is no well-established case in which yeast has been formed without sugar, or in which sugar has been converted into carbonic acid and alcohol without the presence and influence of yeast-cells.*

Schlossberger observed that many juicy fungi (for example, *Agaricus russula*, etc.), when kept in narrow-mouthed, open flasks, underwent vinous fermentation spontaneously, and that alcohol could be obtained from the expressed liquid on distillation; meanwhile true yeast-cells were formed.

According to this, the significance of the plant organism in the phenomenon of fermentation appears to be clear, for it is only through its agency that an albuminate and sugar can be united into a peculiar compound in the liquid where the yeast-plant is developed, or, in other words, associated in that manner in which they can, as a constituent of the fungus, exercise an influence on sugar. When the fungus ceases to grow, the bond uniting the constituents of the cell-contents is dissolved, and it is the molecular motion acquired by the cell contents which enables the yeast-cells to determine a dislocation of the sugar elements, or their separation and rearrangement into other organic molecules.

* It is not here meant that, besides the organized yeast ferment, there is no other which could convert sugar into alcohol and carbonic acid. In regard to this point, it is necessary to direct attention to the highly remarkable characters of the madder ferment discovered by E. Schunck. See Erdmann and Werther's Journal für Prakt. Chemie, vol. lxiii. p. 222.

Schunck showed that in madder, and in its aqueous extract, fermentation took place at a moderate temperature, in consequence of which rubian is converted into a number of new substances, among which alizarin is the most remarkable. Neither yeast nor casein decomposes rubian, and the action of emulsin is only partial. The madder ferment, which Schunck calls erythrozym, is obtained by mixing an aqueous extract of madder with hydrochloric acid, when it separates as a brown flocculent precipitate. In the second stage of its decomposition, it produces a true vinous fermentation in sugar solution, and Schunck found succinic acid among the products (1854), the presence of this substance in all fermented liquids having been ascertained so far back as 1848 by C. Schunck in Dorpat. See Handwörterbuch, vol. iii. p. 224.

(*To be continued.*)

RHATANY FROM PARA.

BY DR. F. A. FLÜCKIGER.

Since the end of last century the roots of *Krameria triandra*, a native of Peru, have been known in medicine under the name of rhatany. At a later period—about 1852 in Germany—it was found to be mixed with the roots of *Krameria Ixina*, a native of the northern parts of South America and of the Antilles. It has been shown by Hanbury (1865) and by Triana* that this plant yields the rhatany† of Savanilla or New Granada. This kind is nowhere properly officinal, but it had, nevertheless, recently and for a time, almost displaced the Peruvian root; until later this has again become abundant.

A third variety of rhatany root was described by Berg,‡ in 1865, as of Brazilian origin, and coming from Para. He obtained it from Gehe and Co., of Dresden. I also obtained this drug from the same source, so that I am able, from my own observation, to confirm Berg's description, adding to it only, that the transverse figures frequently present a jagged course, and sometimes surround the root. They are, on the whole, very regularly distributed; and though at some places they are entirely absent, they become apparent when the root is bent backwards and forwards. The Para rhatany presented in this case a very peculiar elasticity as compared with that of Payta and Savanilla, even when in sticks, $\frac{1}{4}$ inch and more in diameter. Some pieces also presented the very remarkable appearance of numerous corky worts. Like the Savanilla variety, the Para roots become bluish-black when thin slices are immersed in sulphate of iron solution. Very probably this was the root examined by Mettenheimer.§

I have also obtained the same root lately from Étienne Roques and Co., in Paris, and was assured it came direct from Para.|| It is in pieces 16 to 20 inches long, and $\frac{1}{8}$ to $\frac{3}{4}$ of an inch diameter, inclusive of the bark. They are all of a dull, uniform, dark brownish or greyish colour, like the sample obtained from Gehe and Co. This colour in itself is not striking, but if the three varieties of rhatany are compared together, there is a distinctly recognizable difference between them. The Peruvian or Payta rhatany is red, the Savanilla is violet, and the Para root is greyish-brown. The two latter are most alike superficially, and this is probably due to the preponderance of tannin that colours sulphate of iron bluish-black.

The structure of Para rhatany, as described by Berg, corresponds closely with that of the two specimens above-mentioned. But while Berg speaks of its structure as being very different from that of Savanilla rhatany, I should limit that difference to the fact, that in the Para root the middle bark is always

* This word is, as commonly thought, of Spanish origin; but is much more probably derived from the language of the district where the plant grows. Spruce, who is acquainted with this language and with Spanish, directed his attention to the krameria in examining the cinchona region between 1859 and 1861. According to him, *rattani* in the Quichua language, means to hold, fasten, bind together; and the word rhatany appears to be derived from it. In the Spanish Pharmacopœia of 1865 it is called Ratania.

† 'Exposition Universelle de 1867; Nouvelle Grenada et États-Unis de la Colombie. Catalogue de l'Exposition,' p. 10.

‡ Wiggers, 'Jahresbericht,' 1865.

§ Wiggers, 'Jahresbericht,' 1852-53 and 1857.

|| Berg's name, *Radix rhataniæ brasiliensis*, is too comprehensive; *Krameria Ixina* also grows in Brazil.

made up of eight or ten rows of cells, while in the Savanilla kind there are only half as many. Other differences do not appear to be general, when the comparative examination is extended to a large number of sections from roots of various thicknesses. Thus, for instance, in thin pieces only a few cells of the parenchyma are filled with oxalate of lime, while in thicker pieces this is frequently the case, as in the Savanilla roots. Even in regard to the thickness of the bark, the difference is often only one of degree. Moreover, since the parenchyma fibres in the Para variety present a very scattered appearance at the outer circumference of the sections, it is not easy to distinguish precisely between the middle bark and the interior bark.

The identification of Para rhatany is sufficiently ensured by means of the external characteristics above mentioned, except in the case of some few pieces.

After having thus assured myself as to the identity of Berg's Brazilian rhatany with that obtained from Para through the French house, I received a memoir read before the Paris School of Pharmacy by Cotton in 1868. This laborious paper, entitled 'Etude Comparée sur le Genre Krameria et les Racines qu'il fournit à la Médecine,' first specifies the 21 different varieties of Krameria that are known, and then treats of the roots belonging to each. After the Payta root, which is the only officinal kind in France, Cotton describes the Savanilla kind, and explains that there are two very different types of it, viz. the New Granada, or true Savanilla, and that from the Antilles. In reference to the first named type, Cotton gives no information that is new to me, and it corresponds with the Savanilla rhatany described in German works. He states that the roots from the Antilles are now commencing to displace those from New Granada and Peru.

Cotton distinguishes two forms of rhatany from the Antilles, viz. a black kind (*Ratanhia des Antilles à surface noire*) and a brown kind (*R. d. A. à surface brune*). The former is characterized by numerous transverse fissures; the latter is destitute of them, but has longitudinal fissures. Although he is disposed to regard these two forms as being derived from different varieties of Krameria, he, nevertheless, finds all kinds of intermediate specimens. From the description and drawings of the anatomical structure given by Cotton, nothing definite can be inferred. He states, further, that the Antilles kind (probably both the black and the brown) comes from several places on the coast of South America, near Cumanas, and "as far as Guadeloupe." It appears to me, therefore, that it is not especially entitled to the designation of Antilles rhatany.* Cotton adds, that it is generally, and perhaps with reason, ascribed to *Krameria Ixina*, and he believes he has proved this opinion to be correct by his comparison of specimens in the Paris herbarium with those of commerce. But, as will be evident, this applies only to a few fragments of the stem or branches, and not to the roots themselves, so that Cotton's assumption requires further demonstration, as he points out himself, since in regard to the brown kind or variety of Antilles rhatany, he is disposed to regard *Krameria spartioides* (Klotzsch) as the plant it is derived from, and, up to the present time, this is certainly known only in the northern and north-eastern parts of South America.

The question now arises, whether this so-called Antilles rhatany is a new kind, or whether the black form is "identical with that described by Schuchardt* in 1855, under the name Savanilla, while the brown root corresponds to a "false" rhatany, mentioned by Martigny,† as Cotton suspects. I think it very necessary to inquire further into these questions; but, at present, it is my object to clear up the relation between Cotton's rhatany, of the Antilles, and that from Para. Through the kindness of my colleague, Professor Planchon, of the Paris School of Pharmacy, I was enabled to examine the specimens described by Cotton, and to select typical examples of the brown and black kinds of his Antilles rhatany. By comparing these with Para rhatany, I have come to the conclusion that both these forms are identical with it. I may remark also, that this conclusion is based on the examination of twelve pounds of Para rhattany.

The author sums up his remarks as follows;—

1. There are, at present, in commerce, three different kinds of rhatany, which are best named after their principal ports of exportation,—Payta, Savanilla, and Para.
2. The first two kinds are described according to origin and characters in every modern work on pharmacognosy.
3. The Para root was first described by Berg, as "radix ratanhiæ brasiliensis;" by Cotton as rhatany of the Antilles.‡
4. Its colour varies between dark grey and brown; the extremes of this colour were regarded by Cotton as black and brown varieties.
5. This colour is very distinct from that of Payta and Savanilla rhatany.
6. The origin of Para rhatany is unknown.
7. The substitution, in medicine, of Payta rhatany by another is inadmissible. There exist in regard to the tannin, chemical differences which deserve to be investigated. The tannins predominating, or exclusively present perhaps in Savanilla and Para rhatany, produce bluish-black precipitates with iron salts.

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* Originally this was ascribed to *K. Ixina* in the French Codex, also by Mettenheimer in 1852, by Schuchardt in 1855, and by Berg in 1866. Here the confusion began, inasmuch as Berg (Jahresb. 1856) characterized Savanilla rhatany correctly, but did not refer it to *K. Ixina;* while he declared Schuchardt's *Ratanhia antillica* to be identical with it. Wiggers (1856) likewise regarded it as a peculiar kind; Mettenheimer (Jahresb. 1857) identified the root mentioned by him with Berg's (Savanilla or) Granada rhatany, and disputed their identity with the Antilles root from *K. Ixina.* Perhaps Mettenheimer's description may, nevertheless, as already suggested, be referred to Para rhatany, although it is not sufficiently definite. After Hanbury (Pharm. Journ. 1865, Vol. VI. p. 461) referred Savanilla rhatany to *K. Ixina,* it was again classed with the original Antilles kind. In reporting on Hanbury's memoir, Wiggers (1865) was correctly under the impression that the Antilles kind was peculiar, and hence he assumed that, in the Antilles and in Venezuela, *K. Ixina* yielded this particular kind, as the true Antilles root, while the variety *granatensis* was obtained from the same plant in New Granada, as the Savanilla root. Whoever traces these modifications in the idea of Antilles rhatany, will share with me the wish to follow them out completely. After all, it seems to me very questionable whether the former French Codex was right in referring its Antilles rhatany to *K. Ixina.*

* Botanische Zeitung, vol. xiii. p. 536, and Wiggers, Jahresb. 1855, p. 48.

† Encyclop. der med. pharm. Naturalien- und Rohwaaren-kunde, 1834, p. 562.

‡ Cotton was not acquainted with Berg's work.

SPOGEL SEEDS.

Plantago ispaghula, Roxb.

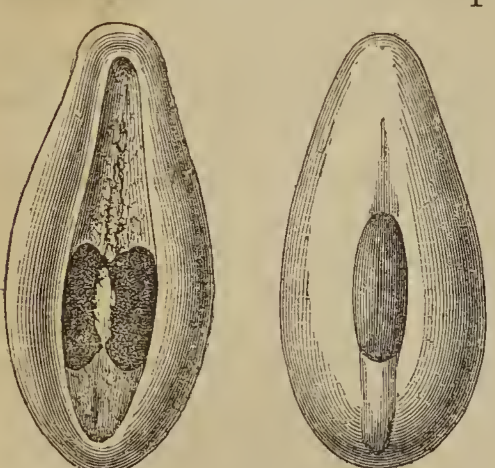
BY M. C. COOKE.

Spogel seeds have long been known and employed in the East. Probably both seeds and the report of their virtues were first derived from Persia. The seeds of several species of Plantain, as *Plantago amplexicaulis*, Cav.; *P. ciliata*, Desf.; *P. decumbens*, Forsk., and *P. major*, var. *asiatica*, are used in North-Western India, as well as those of *P. ispaghula*. Dr. Stewart says that all these, and it may be others of the wild species, at times, are collected and sold as the officinal seeds, known under the two names of "isafghol" and "bartang." They are considered cooling and emollient, and given in diarrhœa and fever. Honigberger states that the seeds of *P. major*, which are brought from Cashmere, are officinal with the Hakims.

The true spogel seeds are those of *P. ispaghula*, Roxb. They are the 'Ispagool' of the Persians, called by the same name in Hindustani, the 'Ispungur' of Sindh, 'Ispoghol' of the Tamuls, 'Isphagula' of the Teloogoos, the 'Buzr-katoona' of the Arabs, and the Yonanee 'Fuslioon.'

The plant itself is thus described:—Stem very short, soon dividing into three or four ascending round villous branches which are a few inches in length. Leaves alternate, linear-lanceolate, 3-nerved, luxuriant in young plants, remotely denticulate, somewhat woolly, towards the base channelled, and stem-clasping, length six to eight inches, by a quarter to half an inch broad. Peduncles axillary, solitary, naked, erect, round, a little villous, the length of the leaves. Spikes solitary, terminal, when in seed 1 to $1\frac{1}{2}$ inches long, and erect. Capsule ovate, 2-celled. Seeds solitary, ovate-elliptic, convex on the outside, concave on the inner. Integument rather thick, tough, and brown.

The seeds are the officinal part, and are about the eighth of an inch in length, of a greyish colour, with a pinkish tinge. Under the microscope they bear some resemblance to a minute cowry shell, the concave side having a deep longitudinal furrow or cleft, which is gaping at the middle and narrowed towards each end. They yield to water an abundance of tasteless mucilage.



Ainslie observes that the seeds are of a very cooling and mucilaginous nature, and are, on that account, much prized by the native practitioners, who prescribe an infusion of them in cases of gonorrhœa, catarrh, and in nephritic complaints. He adds, this is one of the few articles of the Tamool Materia Medica, the virtues of which are so well ascertained by the English inhabitants of India, as to have rendered their use common in the regimental hospitals.

Dr. Waring, in his 'Remarks on Bazaar Medicines' says, "These seeds, which are procurable in most bazaars, are highly useful, by their demulcent and mucilaginous qualities, in diarrhœa and dysentery, and they may be advantageously employed, whether fever be present or not. In the early stages of these diseases they are best given in decoction, prepared by boiling four drachms of the bruised seeds in two pints of water, till the quantity is reduced to one pint, and straining. The whole of this may be taken, in divided doses, in the course of the day. It need not interfere with the use of opium, or any other remedies deemed necessary. In chronic diarrhœa they are best given whole, in doses of two drachms and a half, mixed with half a drachm of sugar-candy or sugar. In their passage through the intestines they absorb as much fluid as make them swell, and by the time they reach the lower part of the canal, they give out a bland mucilage, and in general continue to exercise their mucilaginous property until they are passed by stool. They are chiefly useful when the stools are very watery. A low diet and small doses of opium aid their operation.

In the new India Pharmacopœia, this drug is included amongst the primary articles, an evidence of the esteem in which the authors held it for Indian practice. On one or two occasions only it has appeared in the English market. The only preparation named in the above work is the decoction of the seeds, but, when bruised and moistened with water, they are also recommended as forming a good emollient poultice.

Mr. Twining, in his 'Diseases of Bengal,' quotes the report that a slight degree of astringency, and some tonic property may be imparted to the seeds by exposing them to a moderate degree of heat, so that they shall be dried, and slightly browned. "This remedy," he adds, "sometimes cures the protracted diarrhœa of European and native children, after many other remedies have failed."

In Spain, perhaps also in other parts of Southern Europe, and on the northern coast of Africa, the seeds of another species of Plantain, *P. psyllium*, Linn., are employed for their mucilaginous properties, and are made into demulcent drinks as a substitute for linseed or marsh-mallows. Many other species possess like properties in a more or less eminent degree.

THE CHEMISTRY OF THE ATMOSPHERE.

BY J. ALFRED WANKLYN.

Having treated of the general conclusions to be drawn from chemical examinations of the atmosphere, I will now consider the analytical operations by which the composition of the atmosphere has been investigated.

The amount of oxygen in air is determined by ascertaining the degree of contraction which a mixture of a certain volume of air with an excess of hydrogen gas undergoes on being exploded by the electric spark; one-third of the contraction is equal to the volume of oxygen contained in the original air. Another method, which is very nearly, but not quite so accurate, is to absorb the oxygen directly, by means of pyrogallate of potash. The determination of the proportion of oxygen in air ranks among the most accurate operations of chemical analysis. This has been splendidly exemplified by Regnault and Bunsen.

The carbonic acid in the atmosphere has been determined by several methods in recent times. The plan of absorbing the carbonic acid by means of potash, and then reading the contraction thereby produced, is very unsatisfactory, inasmuch as the normal quantity of carbonic acid in the atmosphere is not more than twice as large as the experimental error involved in the two readings requisite for determining on the amount of contraction sustained by the volume of air experimented on. This will be apparent from the following figures:—In 100 volumes of average air, there is from 0·030 to 0·040 of a volume of carbonic acid. The readings of "original volume of air, before absorption by potash," and "volume after absorption by potash," cannot be depended upon as being accurate within less than the $\frac{1}{10000}$ of the total volume operated upon. In the instance, therefore, of a perfectly pure gas, absolutely devoid of carbonic acid, we should sometimes get 0·02 for the percentage of carbonic acid. In other words, a variation of 0·02 per cent. is devoid of meaning when this method is employed. But 0·02 per cent. is equal to more than one-half of the average percentage of carbonic acid in the atmosphere; consequently this method cannot be depended on for determining the actual variations which occur in the carbonic acid of the atmosphere, and this should be borne in mind in reference to results obtained in this way. Possibly the abnormal results obtained by Dr. Frankland in the examination of air from the summit of Mont Blanc, were due to this cause.

Another method employed for this purpose, is to ascertain the gain in weight, which an apparatus charged with solution of caustic potash undergoes when a known volume of air is transmitted through it. This method is obviously unsatisfactory, for a gas, containing so little carbonic acid as the atmosphere, cannot be deprived of its carbonic acid unless it be passed through solution of an alkali at a rate far slower than is practicable, and it is impossible to ensure that the immense volume of inflowing gas shall be in exactly the same state of dryness as the outflowing gas. The third method, which alone is satisfactory, is rather an old one. It consists in enclosing a known volume of air with a quantity of lime or baryta-water, and subsequently observing the quantity of carbonate formed. De Saussure, who was the first to operate in this manner, weighed the carbonate of lime; Dalton, and later, Pettenkofer accomplish the same end by means of titrations; the strength of the volume of lime or baryta-water being known beforehand, a titration of the lime or baryta-water, after the absorption, furnishes the requisite data. As has been said, we never meet with so much carbonic acid in a badly-ventilated room as to be of any importance in itself; inasmuch, however, as the discharge of carbonic acid into the atmosphere never takes place without being accompanied by other contamination, the amount of carbonic acid in a given specimen of air may be useful as an index to the general purity of the specimén. From this point of view, accurate determinations of the carbonic acid in air acquire a value. They are, moreover, very easily made.

Referring to Dr. Smith's Report for 1869, let us consider the method of research followed in his inquiries. This may be characterized as consisting in washing a known and generally enormous volume of air with a relatively small volume of water, and then examining the water. The results of the water-analysis are subsequently to be referred to the volume of air which has been submitted to the process of washing.

The first question naturally arising is, how far washing with water is capable of removing microscopic quantities of impurity from air? I have no hesitation in asserting that the operation of washing air, or other gas, with water is adequate for the entire transference of all finely divided solids, and all *vapours* from the former to the latter. A few years ago the author had a large quantity of gases, wherein was diffused the vapour of a liquid. That vapour was the product of a new reaction he was studying, and from the circumstances of the case, it could be obtained only as vapour mixed with large volumes of gases. How to extract the vapour was the question? By reducing the temperature as far as possible nothing was to be expected. For, unless at the lowest temperature reached, the tension of the vapour should fall so low that the volume of the gas would become supersaturated with vapour there could be no condensation at all. Even when condensation did occur, a certain quantity of vapour would necessarily remain, sufficient to saturate the gases at that temperature. Washing the gas with water was therefore tried, and it proved successful; the liquid sought for, which had existed in the form of vapour diffused through an immense volume of gas, was found in the wash-water. The ease with which such absorptions are effected, and the obvious completeness of the operation will commend themselves to all who make experiments of this kind.

In order to ensure the complete absorption of every trace of vapour and finely divided solid, the method adopted by Dr. Ransome, in his recent experiments on the organic matter of respired air, will doubtless prove very advantageous. Dr. Ransome cooled the air until the aqueous vapour in it began to condense, and then shook up with water. A little consideration will show how admirably this method of procedure is calculated to promote a thorough washing of every particle of the air under examination.

In the new air-analysis, this extraction of the liquid and solid impurity by means of washing with water is a cardinal method, and it deserves a prominent place among the resources of modern chemical analysis.

The method of water-analysis, used by Dr. Angus Smith for the examination of the wash-water, was that invented by Wanklyn, Chapman, and Smith, viz. the ammonia-process.

CHLORAL.

BY C. A. MARTIUS AND P. MENDELSOHN-BARTHOLDY.*

In the course of our experiments on the preparation of hydrate of chloral, it fell in our way to examine different preparations found in commerce, the purity of which was guaranteed by crystallization from sulphuret of carbon and ether, and subsequent pressing out. Our attention was also directed to the varying statements respecting the points of fusion and ebullition of hydrate of chloral, and to the possibility of admixture of foreign substances, even after the renewal of free chlorine and hydrochloric acid, and notwithstanding its solubility and apparent homogeneity; and that to these foreign substances might be due the discrepancies relative to physical properties, and possibly also the physiological discrepancies found by different observers. We were especially struck by the differences in boiling-point in different preparations, and led to the preparation of a series of

* Buchner's 'Repertorium für Pharmacie,' 1870.

compounds which threw light upon these discrepancies, and which are, moreover, of some scientific interest.

It had been observed by J. Personne* that chloral enters into combination with alcohol just as it does with water. According to our observations, the other alcohols of the fatty series behave similarly to ethylic alcohol. When one equivalent of chloral is mixed with one equivalent of anhydrous ethylic alcohol, there is union accompanied with development of heat, and, on cooling, the resulting compound solidifies into a crystalline mass. The same takes place when methylic, butylic, or amylic alcohol, or mercaptan, is substituted for ethylic alcohol.

We may regard these compounds as intermediate trichloracetals.

Acetal.	Trichloracetal.	Chloral-hydrate.
$CH\begin{cases} CH_3 \\ OC_2H_5 \\ OC_2H_5 \end{cases}$	$CH\begin{cases} CCl_3 \\ OC_2H_5 \\ OC_2H_5 \end{cases}$	$CH\begin{cases} CCl_3 \\ OH \\ OH \end{cases}$
Chloral alcoholate.	Chloral amylate.	Chloral mercaptide.
$CH\begin{cases} CCl_3 \\ OH \\ OC_2H_5 \end{cases}$	$CH\begin{cases} CCl_3 \\ OH \\ OC_5H_{11} \end{cases}$	$CH\begin{cases} CCl_3 \\ SH \\ OC_2H_5 \end{cases}$

Inasmuch as the production of these compounds takes place without formation of any bye-products, analysis of them appeared to be unnecessary. We have, however, taken the vapour-densities of some of them, and found that, like chloral-hydrate itself, they have only half the condensation indicated by their formulæ.

With the *ethers* of the alcohol-radicals chloral does not combine. The compound of chloral and ethylic alcohol boils at 115° to 116° C., and solidifies at 40° C., becoming crystalline. At 40° C. (in the fluid condition) its sp. gr. is 1·143.

In cold water it dissolves only slowly, but on warming, the solution is complete. In ether, alcohol, acetic ether, and petroleum, it is easily soluble; and on cooling the hot concentrated solution, it crystallizes out in long beautiful needles.

The methylic compound resembles the ethylic compound very closely. It boils at 98° C.

The amylic compound boils at 143° C., and at 25° C. has a sp. gr. of 1·2340. At 25° C. it solidifies to a crystalline mass, which is soluble in ether, alcohol, and petroleum. From the last-named solvent it is capable of crystallizing in long tufts of needles. Only on prolonged boiling with water is the decomposition into chloral and amylic alcohol complete.

Chloral-mercaptide, chloral, and mercaptan combine with great evolution of heat, and form a crystalline compound, soluble in ether, alcohol, sulphuret of carbon, and capable of crystallizing easily out of its solutions in these solvents.

We can easily understand that the alcohol-compound has been often taken for the hydrate of chloral, and that the hydrate has been often contaminated with the alcoholate.

It appears to us to be especially interesting to study the physiological characters of the alcohol-compounds; according to O. Liebreich, the physiological effects of the alcoholate differ essentially from those of hydrate. In preparing the hydrate for medicinal use, one of the main points to be attended to is its freedom from alcoholic compounds. Pure hydrate of chloral boils at 95° C., as we have ascertained by numerous experiments.

MUSHROOMS.

Two cases of cryptogamic poisoning have been reported within the last fortnight, and it is certainly very much to be regretted that the difficulty of distinguishing between poisonous and non-poisonous Fungi is so great, since mushrooms are held in such high estimation as a delicacy by all classes, and are gathered and consumed in great quantities with so little discrimination. Looking at the whole class of Fungi, and the purpose served by its members in the economy of nature, we may consider them in the light of highly nitrogenized, and therefore nutritious material, their special office being to convert organized material into organic mould, serviceable for the growth and nourishment of the more highly organized plants, while their own growth is supported by the nitrogenous elements of their nidus.

The phenomenon of their growth may be simply illustrated by observation of the yeast-plant in the fermentation of beer, or of the vinegar-plant in the production of vinegar. Both these Fungi are species of *Mycoderma*, and, speaking generally, they grow in a fluid containing nitro-hydro-carbonaceous material mixed with variable quantities of accidental elements and compounds, and, by appropriating to themselves the nitrogenous element, they leave the hydro-carbonaceous atoms to rearrange themselves. But it happens that in the progress of these changes an alkaloid, or sometimes probably more than one, is often developed, and may be taken up by the fungus. These alkaloids are all more or less aerial, and according to the degree of their acridity they render the fungi containing them more or less poisonous.

The material forming the nidus affects the character of the alkaloid. Specimens of the same species of *Agaricus* grown in different beds will vary in acidity to a degree corresponding with the nature and composition of the bed in which they have been raised. Climate also appears to possess considerable influence in the production and assimilation of the alkaloids in fungi, since many species may be eaten without risk in one country, while in another the same species are markedly poisonous.

The mushroom we use commonly in England, for instance, is held to be poisonous in Italy, and prohibited in the Italian markets; while in Paris the only species allowed in the markets is the *Agaricus campestris*, excepting, of course, the truffle (*Tuber æstivum*) and morel (*Morchella esculenta*). *Boletus edulis* has, however, been cultivated in the south of France. The mushroom most highly esteemed in this country is the *Agaricus campestris*, of which the pileus is fleshy and dry, plano-convex, flesh-coloured, becoming brown; the stem is stuffed and even, with a white ring, somewhat torn, placed about its middle; the gills are free. In some parts of the country the *Agaricus arvensis* is much prized, but it is coarser, and more likely to be acrid. It is white, afterwards becoming a pinkish-brown, and it often attains an enormous size.

A third variety is the *Marasmius oreades*, or champignon, which may usually be eaten with impunity; it, however, is sometimes very acrid, and requires to be gathered with judgment, for *Marasmius urens*, which often grows in the same meadow, is of very much the same appearance, and is particularly acrid. The last-named, however, is darker, and has narrower gills.

In France, the ordinary mushroom, *Agaricus campestris*, is in common use, as already stated; *Boletus edulis* has also been cultivated, and is thought much of. The appearance of this fungus, however, is against it; it is high-coloured, watery-looking, and forbidding. The truffle (*Tuber cibarium*) is considered an exceptional delicacy, and is much sought after.

It is not, however, the epicurean view of the subject we now desire to take, but the practical and interesting question how to distinguish non-poisonous fungi from those which are poisonous. The duty of gathering mushrooms for commercial purposes usually falls to the share of the uneducated. They, with a little experience, and provided they exercise due care, are morely likely to discriminate than educated persons, or even sometimes than the botanist, paradoxical as this may appear; because, from their daily practice, they are familiar with both the good and the bad growing in their neighbourhood. But accidents do occur, and will continue to

* 'Comptes Rendus,' vol. lxix. p. 1363.

occur, notwithstanding all precautions; and it seems impossible to lay down any rule that would entirely provide a safeguard, since even the cultivated *Agaricus campestris* may produce nausea. Still, there is good reason to believe that more casualties arise from carelessness than from ignorance; and attention to a few simple rules may prevent much unpleasantness and alarm.

As a rule, the edible mushrooms may be distinguished from their poisonous brethren by their delicate sweet aroma, as contrasted with the heavy acrid smell of the false mushrooms. Secondly, the delicacy of the true mushroom—which is free, or almost free, from warts—contrasts with the scaly surface of the false. The true are either white or brownish; their flesh is brittle; they grow in the open dry pastures, and usually are solitary, while the false often grow in clusters, in wet ground and in the shade, are tough and watery, and highly coloured.

There can be very little doubt that many species now avoided might be eaten, but are neglected for want of experiment.

Experience has gone to show that, after pickling in vinegar, mushrooms, however indiscriminately they may have been gathered, rarely give rise to discomfort, probably from neutralization of the alkaloid by the acid of the vinegar.

Sufficient cooking also appears to render the alkaloid inert; and it is possible that good dressing would render many fungi, not only harmless, but nutritious articles of diet. Darwin found the inhabitants of Tierra del Fuego living on a bright yellow globular fungus, *Cyttaria Darwinii*, found on the beach; and, in Australia, the *Mylitta australis* is used as a staple article of food, and called native bread.

It must not, however, be forgotten that there are certain persons whose constitutions are obnoxious to fungi, the least possible quantity producing in them nausea and a sense of sinking, with a dread of impending dissolution, which are the characteristic symptoms of fungus poisoning. But, with the exercise of care in selecting only those that are quite perfect and fresh, proper cooking, and by taking a reasonable quantity of some other food, such as bread or meat, at the same time,—above all, not indulging in them too plentifully,—mushrooms may be eaten with impunity; and they constitute at once a nutritious article of consumption, and, to many, a grateful luxury.

REPORT OF EXPERIMENTS ON THE IODIDE OF POTASSIUM USED IN MEDICINE.

With the object of ascertaining the degree of purity which may be looked for in the iodide of potassium as supplied by the druggist to the medical man, we procured six samples of the drug and submitted them to chemical analysis. These samples were obtained from hospitals and from druggists in various parts of London.

The chemical examination was made as follows: 8·305 grains of the iodide, in the undried state and not previously powdered, was dissolved in a little water, and to it a very little alkaline chromate of potash was added, and a standard solution of silver was then dropped into the liquid until the red tinge (the sign that the iodide of potassium was completely saturated with nitrate of silver) made its appearance. The quantity of standard solution of silver being noted, the quantity of silver was of course known. As will be seen from the tabular statement, the quantity of silver used up was that indicated by theory in the first five cases, while in the last only it was a little in excess of the quantity required for absolutely pure iodide of potassium.

After noting ~~the qu~~antity of silver solution, the resulting iodide of silver was washed first with very dilute nitric acid, then with pure water, and finally dried and weighed. The following is a tabular statement of the results thus obtained, viz.:—

No.	Obtained from	Quantity of Iodide of Potassium taken. (grains.)	Quantity of Iodide of Silver. (grains.)	Quantity of Silver employed. (grains.)
1.	Moorfields Eye Hospital	8·305	11·49	5·40
2.	London Hospital	8·305	11·68	5·40
3.	Skin Hospital	8·305	11·66	5·40
4.	Leo Lee and Co., Bishopsgate Street	8·305	11·66	5·40
5.	Hancock, Fleet Street	8·305	11·48	5·40
6.	Warner and Co., Fore Street	8·305	11·68	5·51
	Theoretically pure iodide of potassium	8·305	11·750	5·40

From these results it appears, firstly, that the iodide of potassium is remarkably free from bromide and chloride; and secondly, that, as actually sold, it is very dry. According to these analyses, 100 parts of commercial iodide of potassium contain from 99·3 to 97·7 parts of absolute iodide of potassium, the remainder being the inevitable "hygrometric moisture." It is most satisfactory to find this drug to be commonly supplied in so high a state of purity. We cannot, however, forbear remarking on the high price which is charged for it. A druggist commonly asks two shillings an ounce for iodide of potassium. Now, iodine itself is dear at one shilling an ounce, and iodide of potassium ought not to cost more than iodine; it ought, indeed, to be cheaper than iodine.

There are two varieties of iodide of potassium—the *opaque* crystals and the *transparent*. Fashion has led to the opaque kind being preferred; but there is no other reason in favour of the opaque. The transparent crystals are just as pure.—*The British Medical Journal.*

CHEMICAL EXAMINATION OF SEVERAL SORTS OF CONDENSED MILK.

BY L. KOFLER.

The following samples, examined by the author, were exhibited at the Agricultural Show at Schwarzach:—

I. From the Anglo-Swiss Condensed Milk Company, in Cham, Canton Zug; in air-tight tin boxes containing one pound.

II. From the manufactory at Sassin; in square glasses.

III. From the German-Swiss Milk Extract Company, at Vivis and Kempten; in glass vessels.

IV. The same; in tin boxes.

For the purpose of comparison, a similar preparation was made with milk that had been examined during twelve days previously, with the following results:—

	Specific gravity.	Amount of Cream.
15 October	1·034	13
16 "	1·036	13½
17 "	1·040	14
18 "	1·034	13
19 "	1·034	13¼
20 "	1·034	13
21 "	1·035	12
22 "	1·033	12
23 "	1·034	13½
24 "	1·036	12
25 "	1·035	15
26 "	1·033	15
Mean results	1·035	13·1

This preparation was marked V., and underwent the same examination as the other samples.

Determination of Water.—By drying until the weight remained constant.

Determination of Fat was made by extraction with ether, until the residue examined under the microscope presented no fat globules.

Determination of Casein and Albuminous Material was made by slightly acidifying with acetic acid at a gentle heat, filtering, and drying.

Determination of Salts by incineration. The further examination of the ash showed that it contained, like the ash of pure cow's milk, upwards of 40 per cent. of phosphates, and that one-half consisted of potash, soda, lime, and sulphates.

The amount of sugar in the samples varied between 25 and 30 per cent.; the amount of milk sugar, between 14 and 18 per cent.

The following table gives the general results:—

Constituents.	I. Cham.	II. Sassin.	III. Kempten.	IV. Kempten.	V. Standard.
Water . .	22·180	18·824	22·421	18·810	20·770
Fat . . .	12·260	12·625	12·030	13·650	12·830
Caseine and Albumen .	28·100	24·240	25·960	24·900	29·600
Ash . . .	2·180	2·482	2·673	2·430	2·865

All of these samples, dissolved in four or five times the volume of water, furnished milk which, in appearance and taste perfectly resembled fresh boiled milk, except that it was sweet, owing to the admixture of sugar.—*Vierteljahresschrift für Praktische Pharmacie.*

FACTS AND REASONINGS CONCERNING THE HETEROGENEOUS EVOLUTION OF LIVING THINGS.

(*Continued from page* 66.)

In his essay bearing the above title, Dr. Bastian criticizes Pasteur. We quote the following passage:—

"Before closing this paper, it will be necessary that I should refer more particularly to a certain part of M. Pasteur's researches, seeing that these have so strongly influenced the opinions of very many scientific men on the question of the truth or falsity of the doctrines of the heterogenists. As an experimental chemist M. Pasteur takes a most honourable position in the foremost rank of workers, and all his investigations on this subject appear to have been conducted with the most scrupulous care. His reasonings also may seem, at first sight, to be all-convincing, so that most people might be inclined to admit that he had 'mathématiquement démontré,' as he so frequently claims to have done, all that he set himself to prove. The case may seem at first a poor one indeed for the heterogenists; but as soon as one gets over the first impressions produced by the various experiments, and begins to inquire whether the reasonings concerning them have been in all cases fair and logical, then it may be seen that the evidence against the occurrence of heterogenesis is very far from being so strong as it, at first sight, appeared. On two or three occasions, when it was very important that results should be looked at from different points of view, M. Pasteur has altogether failed to do this, and has wished to interpret them only in accordance with the views of the panspermatists, *quietly ignoring the equally legitimate interpretation of the same results which might have been given by the heterogenists.* At present I shall confine myself to one instance of this kind, because I think that on this particular point the reasonings of M. Pasteur are as mischievous as they are illogical. If others were to follow his example, then certainly we could never hope to get rid of the clouds of controversy which at present obscure the subject.

"The experiments of Schwann were for some time erroneously believed by very many to have upset the doctrines of the heterogenists. No organisms, it was said, were ever developed in hermetically sealed vessels when the solutions containing the organic matter had been boiled, and when all the air which was allowed access to them had been previously calcined. Schwann's experiments did yield uniformly negative results when solutions of meat were employed; though his experiments concerning alcoholic fermentation yielded results which were sometimes positive and sometimes negative. M. Pasteur also, for a time, obtained only negative results in repeating the experiments of Schwann. In these experiments, however, he had generally made use of 'l'eau de levure sucrée,' of urine, or some other fluid which was naturally unfitted to undergo evolutional changes of a high order, or even to produce lower organisms in great abundance. But there came a time when M. Pasteur chanced to repeat his experiments, using precisely the same precautions as before, and yet the results were quite different,—organisms were now found in his solutions. There was one important difference, it is true. In these latter experiments, M. Pasteur had made use of milk. Now the quantity of organic matter contained in milk is, of course, very great; it is a highly nutritive and complex fluid. It might, therefore, and ought perhaps, to have suggested itself to M. Pasteur, that the different results of his later experiments were possibly explicable on the supposition that the restrictive conditions—the boiling of the solution and the closed vessel already containing air—were too potent to be overcome by the organic matter in the one solution, whilst they were not too potent and could not prevent evolutional changes taking place in that of the other."

In fine, M. Pasteur, having made the observation that milk, even after boiling and being sealed up in calcined air, produces bacteria and vibrios, draws the conclusion that therefore the germs of bacteria and vibrios are capable of resisting a temperature of 100° C. Dr. Bastian, on the other hand, maintains that the production of bacteria and vibrios in the milk after this treatment is a proof that these living things have arisen *de novo.*

Pasteur has observed that in alkaline or neutral solutions of sugar, etc., there is frequent development of low forms of living things after boiling and sealing, in contact with calcined air; whilst in acid solutions, other things being the same, there is no development of organisms. Pasteur says that the acid kills the germs. Bastian and the evolutionists, on the contrary, say that the acid is unfavourable to "evolutional" processes.

At the present stage of the controversy, it is admitted by the opponents of the doctrine of spontaneous generation, that organisms do arise in solutions which have received no germs from the air and have been exposed to a temperature sufficient for the destruction of the developed organisms.

In order to avoid having to admit the doctrine of spontaneous generation (which otherwise would be established by such examples), the hypothesis has been started, that the germs of such organisms are endowed with far greater powers of resistance than the organisms themselves. Since there is no microscope powerful enough to render these germs visible, and the only test of their presence being the production of the appropriate organism, it must, in the nature of things, be a difficult task to experiment upon the resisting powers of these germs.

Chinchonæ in Java.—Professor Miquel has given in the last published part of his 'Annales Musei Botanici Lugduno-Batavi' (tom. iv. fasc. 9, 1869), descriptions of all the Chinchona plants at present cultivated in Java. They are as follows:—*Chinchona Calisaya*, Wedd.; *C. amygdalifolia*, Wedd.; *C. scrobiculata*, H. et B.; *C. euneura*, nov. sp. Miq.; *C. Hasskarliana*, nov. sp. Miq. (this appears to be a hybrid between *C. Calisaya* and *C. Pahudiana*); *C. carabayensis*, Wedd.; *C. officinalis*, L.; *C. lancifolia*, Mutis; *C. ovata*, R. et P.; *C. subsessilis*, Miq. (= *C. purpurascens*, Wedd.); *C. caloptera* (= *C. pubescens*, *a. Pelleteriana*, Wedd.); *C. micrantha*, R. et P.; *C. pubescens*, Vahl; *C. Moritziana*, Karst. (= *Buena Moritziana*, Wedd.); *C. magnifolia*, R. et P. (= *Buena magnifolia*, Wedd.); and *C. carua*, (= *Buena carua*, Wedd.).

The Pharmaceutical Journal.

SATURDAY, JULY 30, 1870.

DR. RUMSEY ON THE PHARMACY ACT.

In some recent comments on the Laws relating to Public Health, Dr. Rumsey, the well-known sanitary reformer, remarks—touching the connection, so obvious in theory, between legislative control over the supply of drugs and poisons, and laws affecting the exercise of medical and sanitary functions—that the two departments are so sharply separated in this country, that the late attempt to establish some normal relation between them, in framing the Sale of Poisons Act of 1868, was defeated by the antagonism of its leaders. Yet, in Great Britain alone of all European nations, is the practice of pharmacy legally undertaken by physicians and surgeons acting as apothecaries. The fact that there is no law applying indifferently to all pharmacopolists, and the existence of a controlling power over the examinations of chemists, vested in the Privy Council, are anomalies Dr. Rumsey objects to, as well as the circumstance, that whilst the Medical Council is the sole authority in the compilation of the national Pharmacopœia, it should possess no control over the selection of articles to be included in the Schedule of Poisons. Dr. Rumsey's efforts, as our readers may perceive, are resolutely directed to secure a distinct separation of the duties of dispenser and prescriber. This is a utopian project to many minds, but it is one surely, though slowly, making its way with the medical profession as both desirable and necessary for the true interests of the public as well as the profession. Dr. Rumsey complains, that though there is all the rigidity of caste in the legal separation between the two registers, yet a large number of the men on either register invade at pleasure the occupation of those on the other. He further states, that "Pharmacists have become, in fact, a new race of unqualified practitioners." This is anything but a just way, and it is certainly a one-sided way, of putting the case, considering Dr. Rumsey admits that many of his professional *confrères* systematically usurp the duties of the pharmacist. One more regret is expressed by Dr. Rumsey, that there is no independent supervision of the practice of pharmacy and sale of poisons in the public interests, no inspection of druggists' shops and stores, etc. We believe that Dr. Rumsey is in a distinct minority on this point. Mere inspection, as such, will do little for the public. Their interests are directly secured, (in the only certain way,) in proportion to the excellence of the education of the pharmaceutist and of the examination, by which he becomes qualified for enrolment in the register list. In like manner, mere legislation can do little to promote the desired demarcation between physician and pharmacist. This can alone be brought about successfully by the increased education of the twain.

HYPODERMIC INJECTION.

From the 'Medical Times and Gazette,' we learn that the Committee appointed by the Royal Medical and Chirurgical Society to investigate the hypodermic method of administering medicines, reports as follows:—

1. That, as a general rule, only clear neutral solutions of drugs should be injected.
2. That, whether drugs be injected under the skin or administered by the mouth or rectum, their chief physiological and therapeutical effects are the same in kind, though varying in degree; but
3. That symptoms are observed to follow the subcutaneous injection of some drugs which are absent when they are administered by other methods; and, on the other hand, certain unpleasant symptoms which are apt to follow the introduction of the drugs by the mouth and rectum, are not usually experienced when such drugs are injected under the skin.
4. That, as a general rule, to which, however, there are many exceptions, neutral solutions of drugs, introduced subcutaneously, are more rapidly absorbed and more intense in their effects than when introduced by the rectum or mouth.
5. That no difference has been observed in the effects of a drug subcutaneously injected, whether it be introduced near to, or at a distance from, the part affected.
6. That the advantages to be derived from this method of introducing drugs are:—rapidity of action, intensity of effect, economy of material, certainty of action, facility of introduction in certain cases, and, with some drugs, avoidance of unpleasant symptoms."

In commenting on this report, the 'Medical Times and Gazette' remarks:—

"We may safely take, as a broad guide in practice, the rule that the physiological activity of nearly every substance which can thus be used, is three, if not four times greater when it is given by the skin, than when it is swallowed." The proper commencing dose of strychnine is $\frac{1}{120}$ grain of the sulphate. The dose of atropine is also $\frac{1}{120}$ grain at first. The dose of morphia is $\frac{1}{10}$ grain to $\frac{1}{6}$ grain.

The circumstance, that the action of medicines administered hypodermically is very rapid and often instantaneous, renders the method invaluable in certain cases; as, for instance, in cases of poisoning.

POISON REGULATIONS.

The 'Pall Mall Gazette,' in announcing the fact that this Society is in future to certify the competence of dispensers in naval hospitals, expresses the opinion that this is a very proper proceeding on the part of Dr. Armstrong, the Director-General, and adds that the Society's monopoly is thereby completed. It goes on to say, "All monopolies of the kind are to be regarded with distrust, and watched with anxiety in the public interest. This Association has a twofold position: it has public duties and private interests to consult. The two may not always concur. It is one part of the duties of the Society to lay down regulations for the storing and dispensing of poisons, so as to prevent, as far as possible, the lamentable calamities from accidental poisoning, which so often shock the public mind. We will not say that they have shown any indifference to this duty; but its discussion has been productive of so much difference of opinion, that the matter has been postponed, though we hope not abandoned."

It is evident from these remarks that the action of the Society in regard to poisons is not lost sight of outside its limits and we would suggest that those members who have propositions to offer on this subject should communicate them for publication in the Journal and for criticism by others. It is possible that in this way some good service may be done, while leisurely discussion of the subject and consideration of proposals may lead to a suitable issue more readily than hasty debate would do.

Some few weeks ago an article appeared in a medical contemporary, making use of very strong language in reference to the proceedings of the Nottingham and Notts Chemists' Association. The only assignable foundation for the strictures contained in that article was so obviously misconception, that they might have been passed by in silence had it not happened that two journals connected with Pharmacy have reproduced this objectionable article without any comment and have thus given it an importance it would not otherwise possess. What took place at the Nottingham meeting was reported as follows in the 'Pharmaceutical Journal' of April last:—

"A matter of some considerable importance to the trade was brought forward, namely, the issue of catalogues, not only of surgical instruments, but of many druggists' sundries, by Messrs. Maw, Son, and Thompson, to the medical profession throughout the country, at prices identical with those sent to the trade. Great indignation was felt and expressed by the meeting at the course adopted by this house, which, more than any other, receives the support of the chemist."

From this it will be evident that the vexation expressed by the meeting was not because Messrs. Maw and Co. had sent their catalogue of surgical instruments to the surgeons of the kingdom. Such an objection would have been unreasonable, and the true ground of objection was, that they not only did this in the legitimate exercise of their business, but also issued to medical men catalogues of druggists' sundries. In the article we have referred to, it is assumed that Pharmacists desire to coerce medical men into buying surgical instruments through them. We need not reply to the argument that such a desire would be absurd, further than by stating that it has no existence.

From the 'Journal de Chimie Médicale' we learn that, as a therapeutic agent, bromide of sodium offers several advantages over the corresponding potassium-salt, being much easier of elimination from the animal economy. M. E. Decaisne has administered it to a patient during a whole year without producing that saturation which is observable in the case of bromide of potassium.

We have much pleasure in making known that Dr. F. A. Flückiger, whose paper on Rhatany appears in this number, has been promoted from the position of Private Tutor to the Professorship of Pharmacy and Pharmacognosy at the University of Berne.

We regret to hear that Dr. Thomas Anderson, Director of the Calcutta Botanical Gardens and Superintendent of the Darjeeling Cinchona Plantations, is seriously ill. He left Calcutta some months ago on account of his health.

Dr. Birdwood has published a most valuable and exhaustive paper on the history, botanical and otherwise, of Gum Olibanum, in the last part of the 'Linnean Transactions.'

The plans for the erection of a Pharmaceutical Institute in connection with the University of Marburg have been approved, and the work was to have been commenced at once, but will now probably be delayed by reason of the war.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

Addendum.—P. 69, line 13, *after* Present—Messrs. Buchanan, *insert* Ainslie, Kemp, and Young.

Meetings of Scientific Societies.

QUEKETT MICROSCOPICAL CLUB.

The Fifth Annual General Meeting of this Club was held on Friday evening last, July 22nd, at University College, Gower Street; Peter Le Neve Foster, Esq., President, in the chair.

According to the Annual Report of the Committee, which was read, the Club still maintains its popularity and success. It numbers over 500 members, and meets for the prosecution of microscopical inquiry and discussion twice a month throughout the year. Mr. Peter Le Neve Foster, in vacating the presidential chair, which he had so ably filled during the past year, delivered a valedictory address, in which he called attention to various open questions in microscopical science as fields well worth investigation. Professor Lionel S. Beale, F.R.S., was elected President for the ensuing year, and Messrs. Henry Lee, F.L.S., Arthur E. Durham, F.R.C.S., Peter Le Neve Foster, M.A., and Dr. Robert Braithwaite, F.L.S., were elected Vice-Presidents; while Messrs. Allbon, T. W. Burr, F.R.A.S., Witham M. Bywater, and Charles F. White, were elected to fill four vacancies on the Committee. The proceedings then terminated in a conversazione.

Law Proceedings.

DAMAGES AGAINST A DRUGGIST.

Court of Passage, Liverpool.

Kelly and Wife *v.* Trilfield.—This was a case in which the plaintiff and his wife sought to recover damages from a druggist in Liverpool, as solatium for injuries sustained by Mr. Kelly in consequence of the defendant administering to Sarah Kelly some noxious drug, by which her health was hurt and destroyed. Dr. Commins was for the plaintiff, and Mr. M'Oubrey for the defendant, who, in answer to the declaration of the plaintiff, had entered a plea of not guilty. The case for the plaintiffs was that on the evening of the 20th March, 1869, Mrs. Kelly went to the defendant's shop and asked for half an ounce of castor oil, for which she took a small glass. She asked him to put in some water to prevent the oil sticking to the glass, but instead of doing that he put in some peppermint. Mrs. Kelly then told him that she did not want peppermint, upon which he emptied the glass, and taking another bottle from the shelf poured in something which appeared to be pure water. He then poured in the castor oil, and covered the glass over with a piece of paper. Mrs. Kelly took the oil home and laid it on the corner of the chimney-piece in her bedroom, where it remained till the morning of the 23rd March, when about four o'clock she got out of bed and swallowed it. She had no sooner taken the oil, and had scarcely time to lay the glass on the table, when she felt a burning sensation in her mouth, throat, and chest. She became sick, and immediately vomited the oil up on the floor, blood coming up with it. Her mouth and throat were excoriated, and the boards of the floor where she had vomited are all blackened with the liquid. For two or three months Mrs. Kelly had suffered much from the effects of the unfortunate mistake, especially during her confinement, which happened five days afterwards. Dr. Commins said they were not in a position to say what the defendant had put in the glass to produce such effects as these, but there was no doubt it had been some strong drug which had been put in instead of the water. The medical evidence was to the effect that either sal volatile or liquor potassæ would have produced the effects seen on the plaintiff's throat. Mr. M'Oubrey, for the defence, stated that the defendant had only put cinnamon water in the glass, and suggested that if Mrs. Kelly swallowed any deleterious drug it must have been some of the mixture she was in the habit of using as a French polisher. The defendant was then called, and said he had carried on business in Liverpool as a chemist and druggist for fifteen or twenty years. He recollected the plaintiff coming to his shop on the 20th March, 1869, and asking for some castor oil. She told him she would have anything but peppermint in it, and he then took down a bottle from a shelf opposite the counter, and put some cinnamon water in the glass. Mrs. Kelly returned on the Tuesday morning and said her mouth was sore, and then she three times pointed out to him the bottle from which he poured the liquid into the glass before he put in the castor oil. This bottle contained cinnamon water. Defendant said there was nothing approaching to liquor potassæ kept on that shelf—in fact he kept none of these alkaline matters near the place where he took the cinnamon water from.—The jury found for the plaintiff, damages £10.

[*** We insert the report of this case as it appeared in the Liverpool 'Daily Post,' but confess that we are unable to perceive from it the grounds on which the jury found for the plaintiff. In the first place, the length of time during which the castor oil was left "on the corner of the chimney-piece," apparently in an open glass, affords room for the possibility of some deleterious material having been added in some way. The account of the effects produced by the supposed "noxious drug," are, at least, vague, and there is no statement of the medical evidence by which they might have been rendered intelligible.—Ed. Ph. J.]

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Continued from p.* 46.)

Preparation.—Ammonium carbonate may be prepared in various ways:—

(*a.*) By digesting in a closed flask the commercial carbonate, crushed small, with strong solution of ammonia for two hours, or not much less, at a temperature not exceeding 12° C., or thereabouts, the ammonium carbonate is left as a mealy, obscurely crystalline mass. It is to be dried by pressure between folds of bibulous paper; this operation, after most of the mother-liquid has been absorbed by a few changes of paper, being conducted in a chamber as small as convenient, and as far as possible filled by the salt and the paper used to dry it,—every care, at the same time, being taken to expose it as briefly as possible to the free action of the atmosphere in this stage of the drying. The operation is practically complete when the salt no longer makes distinct wet marks on the drying-paper, though it will then still feel damp. If, when the drying is nearly finished, the salt is found to be firmly adhering to the paper when a change is made, the operation has been so performed as to allow of decomposition taking place, through insufficient exclusion of air, either by having adopted imperfect means for protecting the salt while it was between the folds of paper, or by having made the changes of paper too slowly or too many times. In warm weather it is well to surround the chamber with ice.*

(*b.*) By digesting the commercial carbonate (or any other carbonate of ammonium) with strong solution of ammonia in a closed vessel at a temperature of 20°–25° until it is dissolved, and leaving the solution thus obtained in a cool place, with the vessel containing it not thoroughly closed, in order that some of the ammonia may escape, when minute crystals form, converting it at first into a semi-transparent magma, but afterwards becoming distinct, interlacing, slender prisms. One part of the commercial carbonate to four parts by weight of the strong solution of ammonia is a convenient proportion in which to take them. The digestion generally takes about two days. It may happen when the ammonia has not been allowed to escape, and the quantity of carbonate which has been added is relatively great, that a few larger crystals, having quite a different appearance to the others, will form; when this is the case, the solution must be warmed until these crystals have dissolved, and at the same time some ammonia be allowed to escape, and then on again cooling it these crystals will not re-form. On the other hand, when by prolonged digestion at a gentle heat, a very large quantity of the commercial carbonate has been dissolved in the strongest ammonia-water, fortified occasionally by the passage of ammonia-gas in the cold, the solution only yields the ammonium carbonate with difficulty, until most of the ammonia has been allowed to escape from it by keeping it in an imperfectly-closed vessel, and the crystals are then often large, flattened prisms. In separating minute crystals of ammonium carbonate from their mother-liquor, and preparing them for analysis, the same plan is to be adopted as in the previous method. The preparation is somewhat more manageable than the preparation of the mealy form, and the presence of the crystalline lustre serves as a means of testing its success.

* The chamber I made use of was a small glass pan with vertical sides, having another similar pan, or else a beaker, just large enough to glide into it. On the bottom of the pan a thick layer of circular filters, just fitting the pan, were laid; then came the salt, and over this a second layer of filters; on this a pad of tow, and, lastly, the upper pan, weighted, and sometimes filled with ice.

(*c*.) By passing ammonia through a strong solution of the commercial carbonate until it becomes charged with the gas, when crystals of the ammonium carbonate, similar to those produced by method (*b*), will form in small quantity, either while the gas is passing, if the solution be kept cool, or afterwards, on allowing the solution to stand in a closed vessel in a cool place.

(*d*.) By dissolving a sufficient quantity of the commercial carbonate in warm, dilute solution of ammonia, best in a closed or nearly closed vessel, when ammonium carbonate crystallizes out on cooling. If the free ammonia be present in large quantity, the crystals are small; if it be present in very small quantity only, the salt next to be described crystallizes out; while if it be present in not much more than sufficient quantity to prevent this, the crystals of ammonium carbonate are large. I have found this one of the best methods for getting large crystals.

(*e*.) By adding dilute spirit to a solution of commercial carbonate in ammonia-water (or to any solution equivalent to this prepared in any other way), in quantity somewhat less than enough to cause a precipitate, when the ammonium carbonate slowly crystallizes out in long, flat prisms. As with the last method, the size of the crystals is generally less in proportion to the quantity of free ammonia. When strong spirit is added to a concentrated ammoniacal solution of the carbonate, the whole soon partially solidifies through the formation of minute crystals of ammonium carbonate, large prisms sometimes shooting across the mass when the mixture is not too strong in free ammonia.

(*f*.) By dissolving ammonium carbamate in sufficient quantity in water at a gentle heat (30°–35°) in a closed vessel, when, on cooling the solution, and standing it aside for some time, a little ammonium carbonate crystallizes out.

(*g*.) By dissolving ammonium carbamate in sufficient quantity in strong ammonia solution at the ordinary temperature in a closed vessel, and setting the solution aside with the vessel only imperfectly closed, that ammonia may slowly escape, when ammonium carbonate crystallizes out.

(*h*.) By passing carbonic anhydride into strong ammonia-water for some time, taking care to leave large excess of ammonia, and setting the solution aside in a closed vessel, when the carbonate separates in small, usually minute crystals.

(*i*.) By dissolving good commercial carbonate, crushed small, in water at a gentle heat,—best in a closed, or nearly closed vessel,—setting the solution aside to cool and crystallize, decanting the mother-liquid on to a fresh quantity of commercial carbonate, again effecting solution by heat, cooling, and crystallizing, a second time decanting the mother-liquid, and so on, repeating these solutions and crystallizations a sufficient number of times, when, according to the extent to which the water has been treated with the commercial carbonate, either the last solution, after depositing crystals for one or two days, will, on being decanted, and left for a further time in a closed vessel in a cool place, deposit large prismatic crystals of ammonium carbonate, or the solution will, in one night's crystallization, form over the first crop of crystals a second of the ammonium carbonate, and continue for some time to yield more of this substance.* If, instead of waiting for the solution to crystallize, it be treated with ammonia-water, a precipitation of minute crystals of the salt will take place, and convert the whole into a semi-solid mass. This and method (*d*) are the best for obtaining large crystals. The crystals are relatively short and broad when this solution is allowed to crystallize slowly at medium temperatures; but when the solution which has thus been left standing for some days is exposed to the sky for a night in clear cold weather, long flat prisms generally form.

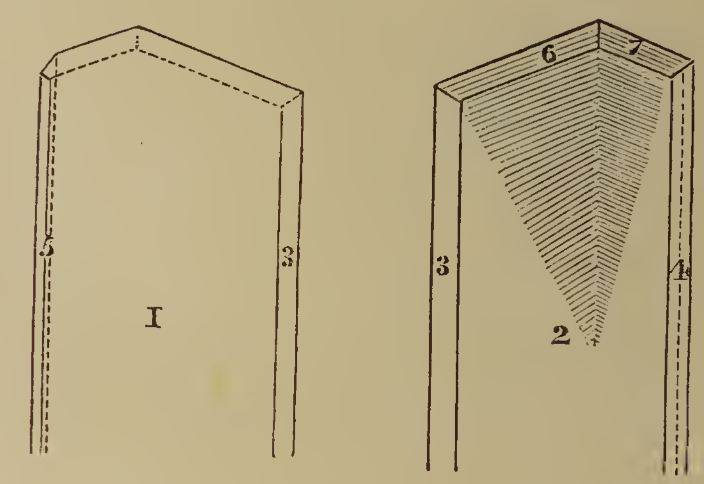
* Details of the action of water on the commercial carbonate will be given further on. It would be inconvenient to go into them here.

Dalton's Method of producing the ammonium carbonate by the wet way has only indirectly succeeded in my hands.

Dalton's Method by the Dry Way.—Dalton gives no further account of this method than that I have set down in the historical notice of his paper.

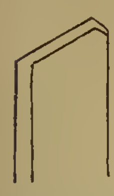
Sensible Properties.—Ammonium carbonate gives out an exceedingly strong ammoniacal odour, due presumably not to itself, but to ammonia as a product of its decomposition. It has an extremely pungent taste, and at once affects the tongue as a caustic to a marked degree.

Form.—Ammonium carbonate takes the form of elongated plates or flattened prisms. Their shape is roughly indicated by the annexed cuts.



The inclination of the side-face 4 to the face 2 does not appear to be the same as that of the side-face 3; nor am I decided whether the side-face 5 is parallel or not to the side-face 3; but the two faces, 4 and 5, I have found it difficult to observe satisfactorily. The faces of the crystals lose their lustre when the mother-liquor is wiped off, and the edges are rapidly destroyed. From the general inclination of the side-faces to the broad face 2, the crystals look like half-forms, or as if the crystal had been formed with its face, 1, on the bottom of the vessel, which is indeed a common position of the crystals. The crystals have, however, the same appearance when formed with both surfaces of the plate free. The end faces, 6, 7, are always hollowed out, and give a distinctive appearance to the crystals.

When large crystals are formed by slow growth, they are so broad in proportion to their length, that they can hardly be described as prisms. But when large crystals are produced in a single night, they are often of great length, shooting across the solution like nitre crystals. One of these I measured, and found it to be 50 mm. long, 6 mm. broad, and about 0·5 mm. thick. Crystals growing over the bottom of the vessel take the broad, short, tabular form; while those produced in the body of the solution assume the slender, flat, prismatic form. When solitary crystals are first seen suspended in the solution, they have a narrow breadth, no sensible thickness, and a considerable length relatively to their minute bulk, and are hardly, if at all visible, except when in a position to reflect light to the eye from one or other of their broad surfaces. A very small absolute bulk of such crystals is sufficient to convert the whole solution into a semi-transparent magma, forming, as they do, equally through all parts of it. When they are very minute, and in not too great quantity, the network they form can be shaken by gently jolting the vessel into a smaller bulk, retaining more or less the shape of the interior of the vessel. Shaken up on to the sides of the vessel, they form masses looking like jelly. Violently shaken up, they subside afterwards to the lower part of the vessel. When the solution filled with these crystals is left undisturbed, the crystals grow, and form a closely interlacing network of slender, apparently four-sided prisms. The ends of small crystals, whether proportionately short or not, are terminated by almost exclusively one face, the other one seen in the large broad crystals being very small, as shown in the margin.



The end faces of large, long prisms are generally very imperfect, but the outline of the broad sides is most like that in the small prisms. Masses of minute crystals, such as are at first obtained by method (*b*), form, when successfully dried, soft, lustrous flakes. When proof spirit is added to a concentrated solution of the carbonate, strong in ammonia, so as to avoid immediate precipitation, minute crystals form, and soon render the fluid semi-solid; shortly afterwards, larger prisms often shoot across the semi-fluid mass. A phenomenon like the last also generally occurs when the semi-solid mass obtained by method (*b*) is cooled in ice, nitre-like prisms shooting across it. When only a very little spirit is used, short, broad prisms sometimes form at the base of the clear solution. A solution not too strong in ammonia, mixed with a suitable quantity of spirit, and left to stand in a covered vessel, becomes filled with interlacing, apparently four-sided prisms.

Chemical Composition.

$$CO_2(OH_2)_2(NH_3)_2.$$

	Carb. anhyd.	Amm.	Water.
Found	38·15	27·85	
"	37·43	28·59	
"	38·44	—	
"	39·84	28·21	
"	39·15	26·50	
"	—	26·23	
"	38·33	28·98	
"	39·42	—	
"	—	27·85	
"	—	27·82	
"	—	29·00	
Calc. .	38·60	29·82	31·58

Behaviour on Exposure.—Ammonium carbonate gets very damp when exposed to the air. A similar change takes place in the half-acid ammonium carbonate, and has been specially pointed out by Deville. Before crystals of the ammonium carbonate can be dried, they lose their lustre, and become semi-opaque and moist, but retain their general shape; when pressed, they break down to a mass of wet acid carbonate. This change is not the result of absorption of moisture from the air, but of the instability of the salt in an atmosphere not charged with the products of its own decomposition; for the action goes on in a stoppered bottle until the air in the bottle is thus affected, and the salt is wet. The change may be thus represented:—

$$CO_2(OH_2)_2(NH_3)_2 = CO_2OH_2NH_3 + OH_2 + NH_3.$$

It is because of this evolution of moist gas that a feeling of dampness in the paper used to dry the salt must not be regarded as proof that some adhering moisture has not been removed from it.

Behaviour when heated.—At about 58° ammonium carbonate is converted into water, carbonic anhydride, and ammonia, when surrounded by an atmosphere formed of products of its own decomposition. When first heated by a water-bath in a retort connected with a tube dipping under mercury, signs of decomposition are apparent by the formation in the retort-neck of drops of fluid and the fibrous crystals already described when the thermometer in the bath registers about 49° or 50°, but the progress of the change is soon arrested unless the temperature is raised, and no marked and continuous change is effected until the water-bath is at a temperature of about 59° or 60°. By maintaining the temperature of the bath at 60° no gas escapes from the apparatus, a moist, solid distillate is formed in the neck of the retort, and the contents of the retort gradually liquefy. Both the residual liquid and the solid distillate contain the ammonia in normal proportion to the carbonic anhydride, but the solid is too deficient in water, that moistening included, to allow of its being represented as an ammonium carbonate, while the fluid in the retort is a solution of the normal carbonate, and, provided the operation is not carried too far, crystallizes out on cooling. The crystals have not been analysed, but they were evidently the normal carbonate. The product of the distillation was analysed.

If the heat be carried some degrees beyond 60°, ammonia escapes during the distillation, and more water rises in vapour with the other constituents. In this case the condensed salt is very moist, but still has not sufficient water to constitute it an ammonium salt of carbonic acid, and, besides, is wanting in ammonia. I shall have again to refer to these products of distillation, and will then give the numerical data of my analyses. The decomposition of the salt by heat is thus represented:—

$$CO_2(OH_2)_2(NH_3)_2 = CO_2 + 2OH_2 + 2NH_3,$$

and is therefore quite distinct from that it undergoes by free exposure to the air.

Behaviour with Water.—Ammonium carbonate is soluble in its own weight of water, or slightly more, at 15°. By cooling the solution contained in a closed vessel, some of the salt crystallizes out again, but mixed with other carbonates.

The saturated solution is of somewhat oily consistence. It smells very strongly of ammonia. Exposed freely to the air it loses ammonia. Heated, it begins to effervesce between 70° and 75°, and boils freely between 75° and 80°, yielding vapours which condense into a moist solid. After boiling for awhile, and then cooling the solution, it is found to be unchanged in properties, except that it is weaker.

A warm saturated solution of ammonium carbonate exhibits the phenomenon of supersaturation and sudden crystallization in a well-marked manner when it is allowed to cool in a closed flask. If the solution does not crystallize while left at rest, it will do so suddenly on stirring it with a glass rod or pouring it out into another vessel.

Behaviour with Alcohol.—Ammonium carbonate is insoluble in alcohol. Crystals of it, treated with rectified spirit, are converted into acid carbonate and free ammonia. An aqueous solution of it is precipitated by alcohol, the precipitate being acid carbonate, or intermediate in composition to this and normal carbonate.

Behaviour with Ammonia-Water.—Ammonium carbonate dissolves in ammonia-water only very sparingly at a low temperature, but, by digestion at ordinary temperatures, the quantity dissolved becomes greater. Strong ammonia-water, added to a concentrated solution of the carbonate, precipitates it unchanged. Ammonia gas, passed into a moderately strong solution, has the same effect. In cases where no precipitate is produced, the mixture will generally deposit some of the salt when cooled in ice. The small solubility of ammonium carbonate in ammonia-water is a fact which is most serviceable in preparing it. Thus, nearly all the methods already given, including, perhaps, that in which the salt is precipitated by spirit from a weak ammoniacal solution, depend upon this influence of ammonia.

Conversion of the Carbonate into Carbamate.—But ammonia has a much more remarkable effect upon ammonium carbonate than that described in the last paragraph. By digesting crystals of the salt with water saturated at a low temperature with ammonia gas for two or more days at a temperature of 20° to 25°, they dissolve in apparently unlimited quantity, and are changed into ammonium carbamate. The mode of proceeding is similar to that adopted in method (*b*) for getting ammonium carbonate in minute crystals. Some of the strongest ammonia-water of commerce is placed in a wide-mouthed bottle, surrounded by ice, and treated with a rapid stream of ammonia gas;* a third of its

* During the passage of the gas the bottle is loosely closed by a cork, perforated to admit the gas delivery-tube, so as to diminish loss by diffusion.

weight or more of crystals of ammonium carbonate are added, the gas still passing; then the bottle is closed with a vulcanized-rubber stopper and gently agitated for a moment, the stopper loosened to allow of restoration of atmospheric pressure by an outrush of the enclosed air, and then tightly inserted again and secured by string; the bottle is then placed where it will be exposed to a temperature of 20° to 25°, and is occasionally agitated. In thirty or forty hours the ammonia solution will have dissolved about half its weight of ammonium carbonate, if so much or more has been added. In any case, though the solvent action of the liquid is not exhausted, it is well to cool the bottle again by ice, and pass more ammonia gas through it, at the same time adding, if necessary, more ammonium carbonate. On opening the bottle for this purpose, after it has been cooled, the internal atmospheric pressure is found to be much less than the external pressure. The solution cooled in ice for hours gives either no crystals or only a few groups of exceedingly minute needles, which the details of the preparation of the carbonate by method (*b*) show almost certainly to be unchanged ammonium carbonate. After the addition of the salt and the ammonia gas, the operation is carried on as before. On again cooling, after thirty or forty hours' digestion, the same appearances present themselves, but a small quantity of minute crystals is now almost certain to appear. The series of operations is to be repeated as many times as are necessary for the solution when cooled by ice, or better by exposure to the sky on a frosty night, to yield the carbamate. When this point is reached, the carbamate appears in the form of beautiful large crystals and crystalline masses along with a few of the minute crystals. If the presence of the crystals be disregarded, and the series of operations, including the addition of more carbonate, be again carried out, the solution, after digestion, yields, on cooling, a large batch of the carbamate. The other crystalline matter does not necessarily increase by repeating the operations, and, when it is present in more than a very small quantity, further digestion with more ammonia suffices to make it appear in less quantity. I have thus converted carbonate of ammonium into carbamate by using only half its weight of ammonia-water, and, after this had been done, there was no sign that the same solution, *plus* ammonia gas, would not have continued to carry on the change in any quantity more of the carbonate.

The solubility of ammonium carbonate in cold concentrated ammonia-water being slight, there can be very little of that added left unchanged. On the other hand, as the carbamate is freely soluble in ammonia-water, much of it remains in solution. No urea could be detected in the solution. The reaction is simple enough:—

$$CO_2(OH_2)_2(NH_3)_2 - 2\,OH_2 = CO_2(NH_3)_2.$$

It may be regarded as being only an instance of the well-known influence of heat in resolving ammonium salts of polybasic acids into the ammonium salts of the amic acids, the use of the ammonia in this case being to prevent a reversion of the change. That ammonia prevents the conversion of carbamate into carbonate I shall afterwards show.

(*To be continued.*)

DEATH FROM AN OVERDOSE OF STRYCHNIA.—AN INTERESTING CASE.

BY CHARLES BULLOCK.

A case of death, resulting from an overdose of strychnia, occurred recently in Pennsylvania under circumstances which render the case interesting and instructive to both medical practitioner and pharmaceutist.

The patient had been labouring under an attack of partial paralysis, and the medical attendant directed the following prescription:—

℞ Strychniæ Muriat. . . . gr.iss
Liq. Ferri Iodidi . . . ʒvj
Syr. Zingiberis q. s. ut ft. f℥iij.
M.
Sig. dose a teaspoonful.

The whole of this prescription was used as directed, and the bottle returned to the druggist, by order of the physician, for renewal of the medicine, the dose on renewal being increased to one and one-half teaspoonful. This was taken with apparent benefit to the patient, until the last dose, exhausting the contents of the bottle, was given. About an hour after, while at a meal, the patient complained of strange sensations, and was soon affected with tonic spasms, which are described by two medical gentlemen, who were called in, as well-marked results of an overdose of strychnia. Proper remedies were promptly used and the spasmodic action passed away, leaving the patient able to speak, but greatly prostrated, and, failing to respond to stimulants, death ensued in a few hours.

The bottle which contained the medicine was produced before the coroner's jury (composed of physicians and pharmaceutists). It appeared to have been drained of its contents to make up the last dose; adhering to the bottle were well-formed crystals, some of them about a line in length, and one-fourth line in thickness. Unfortunately no chemical examination was made to determine whether the crystals were *undissolved* muriate of strychnia or iodide of strychnia. A microscopical examination failed to carry much weight, on account of the destruction of the form of the crystal by washing previous to mounting, the size of the crystal not being accepted in evidence, as crystals of iodide of strychnia were shown nearly as large, made by simple deposition from a warm saturated solution.

The pharmaceutist by whom the prescription was compounded testified, "that he weighed out the muriate of strychnia, threw it into a graduated measure, added the two other ingredients, and stirred them up with a bone spatula until he thought the strychnia had all dissolved, as he could see no undissolved crystals or solid matter." To a question, he replied that he noticed an opalescent appearance, resembling a quinine mixture.

An inmate of the house with deceased testified, "that she was sure that the bottle of medicine was never shaken."

The prescription as above given had been sent to several prominent pharmaceutists, and the compoundings criticized by the jury. In some no chemical change was discernible, in others crystals readily recognizable as iodide of strychnia were floating through the mixture and deposited in the bottom of the bottle. In one case large crystals were contained in the bottle, evidently of the original strychnia salt undissolved.

The jury, after weighing all the evidence, returned a verdict of "Death from prostration, following the accidental administration of an overdose of strychnia.

"The jury further find, from examination of the assistant pharmaceutist, by whom the prescription was compounded, a want of proper attention to, or information in manipulation, which they cannot pass without notice and reprimand, as both efficiency and safety may depend on careful manipulating skill when potent remedies are prescribed.

"They farther find that the ingredients of the prescription are subject to such chemical changes as renders the strychnia contained therein *liable* to be precipitated to the bottom of the bottle containing the prescription; and if the bottle should remain without proper agitation, an overdose of strychnia might result."

So much for the history of the case. We now wish to make some remarks on the chemical and pharmaceutical character of the prescription, and throw out some thoughts on prescribing and compounding, as suggested by this case.

Muriate of strychnia is not officinal in the United States nor British Pharmacopœias, and is rarely prescribed. It is much less soluble than the sulphate, requiring 50 parts of water, at 71° F., for solution (Gmelin's 'Handbook'). The solubility of iodide of strychnia is not found in any authority which I have consulted. It is spoken of as *very insoluble.* My own determinations make its solubility 0·54 parts in 100 parts of water, at 60° F.*

When a drop of syrup of iodide of iron is added to a cold saturated solution of muriate of strychnia, the insoluble iodide of the alkaloid is immediately formed.

I have before me the prescription alluded to in this communication, put up in two ways. In both the muriate of strychnia was previously dissolved in ℥iss of water. In No. 1 the strychnia solution was mixed with the iodide of iron, and the ginger syrup immediately added and well shaken. In No. 2 the strychnia solution was first added to the syrup of ginger, well shaken, and the iodide of iron added. In No. 1 the bottom of the bottle is covered with crystals of iodide of strychnia, and many floating crystals suspended in the mixture. In No. 2 no decomposition is discernible, and after standing four days no deposit has taken place.

On p. 1418 of the U. S. Dispensatory, 13th edition (1870), after quoting from this Journal the experiments of Bouchardat and Gobley, on the insolubility of iodine combinations with strychnia, the authors add: "But though this fact *establishes the impropriety of combining solutions of iodine and strychnia in prescriptions*, yet it by no means justifies the inference drawn from it, that iodine might serve as an antidote to strychnia. Indeed, the contrary has been proved by the experiments of Mr. S. Darby, who found the precipitated iodide of strychnia was highly poisonous to the lower animals," etc.

We have, in the above quotation, information given regarding the insolubility of iodide of strychnia, and the impropriety of prescribing iodine and strychnia solutions in combination.

It is clearly the duty of the pharmaceutist to see that when potent remedies are prescribed in solution that the *solution is complete.* He ought, also, if allowed to dispense such articles, to be informed regarding decompositions liable to occur, and, if possible, guard against mischief likely to result therefrom, or else return the prescription to the writer, with his objections clearly stated. He should also notice when such a prescription is returned for renewal, whether any deposit has taken place in the bottle, and remove it by washing, should such be the case. The question whether it is his duty to mark the bottle "Shake well," when the recipe gives no such direction, is one admitting of different opinions; but we think, when so marked, the error, if any, is on the side of prudence.

We would suggest to physicians, when prescribing a remedy like strychnia in solution to its usual *full dose*, to prescribe it alone, and to give *separately* whatever else may be deemed advisable. We have, in our experience, been made aware of changes unforeseen and unknown to us until the event developed the facts.—*American Journal of Pharmacy.*

[*⁎* Inasmuch as the amount of liquid was three ounces, equal to over thirteen hundred grains, and the hydriodate of strychnine about four grains, it is plain that there was sufficient liquid to keep all of the strychnine in solution.—Ed. Ph. J.]

* Hydrochloric and even acetic acid much increase the solubility of the iodide, without apparent decomposition, when the acids are very dilute.

Chapters for Students.

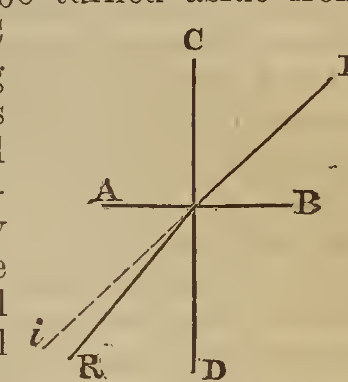
LIGHT—*continued.*

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

7. When light falls upon the surface of a transparent substance, such as a sheet of glass, it is partly reflected from the surface, and the remainder enters the glass. Of the latter portion a certain part, proportionate to the transparency of the glass, is allowed to pass on, is, in other words, transmitted; the remainder is destroyed, it ceases to be light, and is transformed into something else. What becomes of this lost light is not known with certainty.

The light which is transmitted is usually deflected on entering the transparent surface; there is, in fact, only one position which the incident ray can occupy in which it will not be turned aside from following its course. If C were the ray of light falling upon A B, the surface of glass or water, it would proceed straight onwards in the direction C D. But if I, or any line inclined to A B, be the path of the incident ray, it will not go on through *i*, but will be bent in the direction of R.

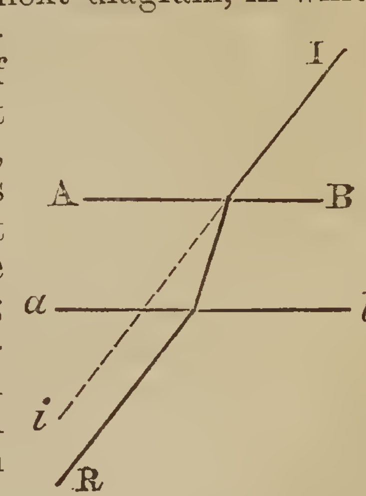


The ray thus turned aside is said to be *refracted.*

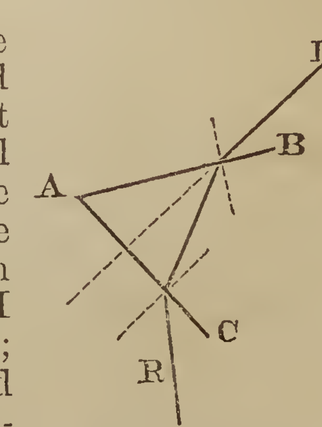
8. When the substance (*e. g.* glass) *into* which the incident ray passes is denser than that (*e. g.* air) *from* which it passes, the ray is refracted, as in the figure, downwards towards the line C D, which is perpendicular or at right angles to the refracting surface.

If R were the incident ray passing from the denser medium glass into the less dense medium air, it would, on the contrary, be bent *away* from this perpendicular in the direction of I.

This is also shown in the next diagram, in which A B and *a b* are the two parallel surfaces of a sheet of glass or other transparent body. The ray I, passing, we suppose, through air, falls upon the surface A B, is bent downwards so as to become more nearly perpendicular; but on emerging again it assumes the direction R, which forms with *a b* an angle equal to that which I forms with A B. The refracted ray R, after emergence, is therefore parallel to the original incident ray I.



9. Now suppose that we have to deal with a wedge-shaped piece of glass, instead of a sheet with parallel surfaces. We shall find that, following the same rules, the course taken by the ray of light will be that shown in the accompanying figure. I is the ray incident upon A B; on entering the glass it is turned down towards the dotted perpendicular; on coming to A C, and emerging from the



glass into a rarer medium, air, it is again bent, but this time away from the dotted perpendicular, and therefore takes the course R. By means, therefore, of such a piece of glass, which is called a prism, the light is brought round a corner.

10. If a beam of ordinary light refracted by a prism, be received on a sheet of paper or other surface, it presents the appearance of a stripe of colours. In the last diagram it will be seen that the direction of the refracted ray I—R is always towards the base or broad side BC of the prism. When the stripe of colours, or 'spectrum' of ordinary light is received on the screen, it will be noticed that the order of the coloured bands is—

RED–ORANGE–YELLOW–GREEN–BLUE–INDIGC–VIOLET

and that the violet end is that which is nearest to the base of the prism, the red nearest to the opposite angle A. The violet is said therefore to be the most refrangible (*i. e.* capable of being most bent by refraction), the red, the least refrangible, and the other colours intermediate in the order given.

11. It was by an experiment of this kind, and by reasoning upon it, that Newton was led to the explanation of the constitution of ordinary sunlight. White light is made up of a number of coloured (and also some invisible) rays, each possessing a different degree of refrangibility. When these pass through a prism, they are bent to the extent peculiar to each respectively, and so undergo *dispersion*, and become perceptible as separate and distinct components; when they are received simultaneously in the eye, without previously submitting to this separation, their combined effect is 'whiteness.' That white light is thus constituted is shown by the experiment already described, and also by the circumstance that if the band of separated coloured rays, produced by sending a beam of white light through a prism, be made to pass through another prism formed of the same material and in a position the reverse of the first, white light will be re-generated. To effect this properly, the two prisms must have an angle A (see diagram) of the same magnitude in both, so that their refracting surfaces may be parallel, when the base of the one is applied to the opposite angle of the other. Under these circumstances the rays which are separated by the first prism are reunited by passing through the second.

12. We are now in a position to understand the production of colour in natural objects. A surface is, for example, red, when it decomposes the light which falls upon it, reflecting only the constituent which gives the impression we call redness, and absorbing all the rest. For a similar reason, on looking through a piece of glass, it appears to be of the colour of the rays which it transmits; the remaining constituents may be reflected or absorbed. Knowledge of these facts helps also to the understanding of the changes of hue which coloured objects exhibit when illuminated by light from different sources. When, for example, a piece of silk appears mauve by daylight, it gives the impression which a mixture in due proportions of red and blue gives. By gaslight the same usually appears red or reddish, from the fact that there is in gaslight so much less of the blue constituent than in sunlight, that when illuminated by the former, the proportion of blue reflected by the silk must be much less, and the red effect predominates. In a photographic chamber illuminated by nearly pure yellow light, all but yellow and white objects appear black; that is, there is no light which they are capable of reflecting.

13. It has already been mentioned that the constituents of sunlight include certain rays which are invisible. They do not produce the impression of light, but the one set of them is capable of heating; the other of effecting chemical decomposition and combination.

If a beam of sunlight is passed through a prism, and the resulting spectrum received upon a screen, it may be found, by the aid of delicate thermometers, or a thermo-electric pile, that the position of greatest heating power is in the dark beyond the extreme point where the red is visible. The position of greatest luminosity is in the yellow portion of the band of light of which the visible spectrum consists; whilst the power of bringing about chemical changes is confined to the other end, the maximum point being found between the indigo and violet. It will, of course, be understood that not only do the luminous parts of the spectrum merge into one another by imperceptible gradations, but that the three forms of action, resulting in heat, light, and chemical activity, are not confined to one narrow portion, but each extends over a considerable proportion of the total length of the spectrum. However, the heating rays are no longer found on reaching the extreme violet; and, in like manner, the rays possessing photographic powers do not extend into the yellow and red.

In a rough sort of way, the subjoined diagram will indicate the relative positions of the constituents of sunlight after they have been separated by the prism.

Dark—R—O—Y—G—B—I—V—Dark

Luminous.

Heating.

Chemical.

Reviews.

ON DIET AND REGIMEN IN SICKNESS AND HEALTH. By HORACE DOBELL, M.D. Fourth Edition. Rewritten and much Enlarged. London: H. K. Lewis. 1870.

We have perused, with considerable pleasure, this small volume in its new form. It contains a number of tables of analysis of various articles of food, dietary scales, and alcohol percentages, also numerous recipes; directions for ventilating, heating, disinfecting, and cleansing; together with many practical suggestions for the preservation of health, the prevention of infection and disease, and the management and comfort of a patient and of the sick-chamber.

Although much of the matter is old, many of the suggestions familiar, and most of the rules laid down those of common and every-day practice, yet the collection of these in a form easy of reference, is of some value, and the book cannot fail to be of interest to the general reader.

A new chapter, consisting of a letter and a leading article from the 'Times,' on "London Noise and London Sleep," is worthy of a passing notice, and the author deserves some credit for having brought the subject prominently before the public.

There are few, whether residents in or visitors to London, whose indignation has not been roused simultaneously with their attention, by two "cabbies careering down opposite gutters and holding a conversation across the road at the top of their voices," or by "drunken rollickers, who choose to sing and halloo up and down our streets and squares." The 'Times,' in considering the necessity entailed upon us by the spirit of the age, to move on, not only at the expense, but at the taxation of our nervous energy, demands on the part of the brain-fagged and overworked, that measures should be adopted to allow exhausted nature, at least, the quantum of sleep upon which she may recover herself; and points out how much might be done by the police towards preserving to the hours of night the stillness which is their portion, and to the Londoner, whether he be overworked or not, the opportunity of the undisturbed rest to which, at least, he is entitled. Emphasizing the opinion that public support and encouragement would be given to well-directed efforts of the police, if they would engage in the cause,—we may add, that any agency that would preserve to us the divine nepenthe, against which so perpetual a war is urged in London, is earnestly to be desired. It, at least, would save a frequent disturbance of our equanimity, which alas, but increases the waste of our *vis vitæ*, and robs the candle of life of that brilliancy with which it should burn, in compliment to the necessity imposed upon it to burn quickly.

We wish Dr. Dobell's book all success.

The Unity of Medicine: its Corruptions and Divisions by Law established in England and Wales; their Causes, Effects, and Remedy. By Frederick Davies, M.D., etc. Second Edition. London: Churchill and Sons.

Dr. Davies' treatise reappears opportunely, when another effort is being made to erect a higher and more uniform standard of admission into the ranks of medicine. He gives a rapid history of the healing art from the earliest to the latest times, and endeavours to indicate the critical epochs when medicine became corrupted, as a profession, by the influx of extraneous elements and interests. The union of the physician and apothecary in one person—a result which was brought about towards the end of the seventeenth century—completely destroyed the distinctive character of either office. The apothecary in England and Wales was entitled to visit and prescribe, as well as compound and sell the medicine he had prescribed, provided only that he received no fee. He was thus tempted, says Dr. Davies, to "measure his own worth and his patient's means, in the price and the quantity of medicine he could persuade him to take." From this ill-assorted union of two distinct branches of the healing art have sprung most of the abuses against which medical legislation is now contending; and Dr. Davies sees no remedy for them, but a strict separation of the calling of the apothecary from that of the physician. "It is impossible," says he, "that the great mass of our profession can pretend in one short life to do the work of two;" therefore, let "the part so abnormally united to the physicians' office,—which has never flourished in their hands, which was never sanctioned by any other age or state,—be consigned to those so well prepared to receive it, with honour to themselves and the profession, and with advantage to all." The rapid progress in the efficiency of the pharmacist—a progress attained by the more exacting examinations to which he is subjected—enables the physician to delegate, with increased confidence, the duty of preparing and dispensing drugs to its appropriate hands; while, relieved of work for which he was but partially fitted by training, he will have more time to devote to his already onerous vocation. This reform has been advocated by many recent writers on professional education, among others, by Mr. Huxley, who is quite in favour of dividing pharmacy from medicine, and constituting the votaries of the former into a distinct and honourably recognized and rewarded profession. Dr. Davies' work supplies many cogent arguments, drawn from history and practical experience, for the acceleration of this reform; and, even the reader, who has little personal interest in it, will find himself strongly attached to the reforming party by the force and occasional eloquence of the author's advocacy.

Eczema: its Nature and Treatment, and, incidentally, the Influence of Constitutional Conditions on Skin Diseases. Being the Lettsomian Lectures for the Session 1869–70. By Tilbury Fox, M.D. Lond. London: Renshaw. Pp. 68.

In three lectures, written with the fluency of the journalist rather than the finish of the man of letters, Dr. Tilbury Fox runs over the main features of the most typical of skin diseases. His views are not so much those of the original investigator as of the practised compiler—a compiler, however, who has seen enough for himself to assume the attidude of an eclectic. He retains all that is good in Willan, and rejects all that is unsound in Von Hebra's supplement to that otherwise sagacious observer; while he keeps firm hold of the one true guide to the nature and development of the disease, to wit, "perverted innervation." Appropriately, therefore, he would have recourse to tonics and alteratives in treatment, while he aspires to head that "conservative reaction" in favour of drugs, as against the too sweeping scepticism that has followed their misuse.

There are, in fact, no diseases which make heavier demands on the pharmacopœia than those of the skin; and Dr. Tilbury Fox does good service by laying down such prescriptions as will convert the practitioner from an unwitting ally into an intelligent combatant of their symptoms.

BOOKS RECEIVED.

Report on the Quality of the Kerosene Oil sold in the Metropolitan District (New York). By C. F. Chandler, Ph.D.

Reports on the Quality of the Milk Supply of the Metropolitan District (New York). By C. F. Chandler, Ph.D.

Attempted Poisoning by Laudanum.—A singular case is described by Dr. Dobbie, of Glasgow, in the 'British Medical Journal' of July 9th, of a lady who had been insane, and was then labouring under the same disease, having swallowed two ounces of laudanum. The poison was retained for two hours and a half, when she became sick: the vomiting was encouraged by the administration of mustard and water, and the patient was quite well the next morning. The case is remarkable, in that so large a quantity of laudanum was taken on an empty stomach, and by a person unaccustomed to its use, without producing any deleterious effect.

Hæmostatic Collodion.—The following formula is given by Dr. Pavesi ('Union Médicale'):—

Collodion, officinal, 100 parts.
Phenic Acid, 10 parts.
Tannic Acid,
Benzoic Acid, of each 5 parts.

Mix, by shaking.

Explosion of Nitro-Glycerine.—The American papers report a terrible explosion of nitro-glycerine, which occurred in a luggage van in Massachusetts, June 23rd, by which one man was killed, and about thirty injured; also property to the amount of 150,000 dollars was destroyed. Fortunately the train to which the van was attached carried no passengers. The effects of the explosion are graphically described, the buildings in the neighbourhood having been destroyed, and portions of the carriages blown to a great distance.

Obituary.

July 25, at Park Place, Leeds, after a short illness, Mr. ROBERT GOODALL, of the firm of Messrs. Goodall, Backhouse, and Co., wholesale druggists.

It is intended, as soon as the particulars can be obtained, to publish a biographical notice of the late Mr. Orridge, whose services in connection with the Benevolent Fund were so great.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

CITRATE OF MAGNESIA.

Sir,—I hope I may, without appearing to be unnecessarily intrusive, be allowed to correct what looks like a misapprehension of the whole scope of my letter on this subject, by Mr. Hughes, in his letter in last week's number. I cannot at present refer to the letter, but I do not believe it contains any expression that conveys the idea that "the sugar exercises any chemical action on the salts," or on anything; but it will be quite apparent to anybody, that if 20 per cent. of sugar be used by one maker, and 30 or 35 per cent. by another, that the same percentage amount of carbonic acid cannot be given off by both samples. Therefore it is, as I have stated, the amount of carbonic acid which is the indicator of the value of the compound.

F. M. RIMMINGTON.

ANONYMOUS WRITING.

On the subject of "Anonymous Correspondence," I would, in reply to the several writers, observe that your Editorial note of the 16th inst. puts the matter on its right footing. Anonymous writing ought to be the exception, not the rule. Why should a writer, honestly expressing his sentiments, hide his identity by a fictitious signature? I read the letters of those whose names appear and of whom I have any knowledge, either personally or by repute, with a real interest and as the communications of friends. It is not possible, as has lately been proved, that even *great names* can make nonsense pass for reason. The analogy between the correspondents of the secular press, and that of a journal devoted to a special interest, is not complete. The writers in the latter may be considered as members of a confraternity and, as such, willing to be known to their brethren; but a letter to the 'Times,' on a social or a political question, is a very different affair.

I am, Sir, yours faithfully,

Bradford, July 23, 1870. F. M. RIMMINGTON.

Sir,—Allow me, through the medium of your valuable Journal, to second the measure proposed by your correspondent of the 16th inst. viz., "That while the subject of medical reform is being broached, pharmacists should agitate and strive to obtain the privileges belonging to their true position, which they have to study to attain." Let us try to gain that pecuniary advantage from our profession which will sufficiently reward us for our pains in acquiring competence as dispensers and not depend on selling grocery and oils for our means of subsistence, thus making what should be a pharmacy into a general store, where pennyworths of arsenic, treacle, tobacco, and other incongruities are to be had with equal ease. However convenient this may be for customers, it does not require a knowledge of botany and chemistry to wait upon such customers, and they are the most numerous in country towns where medical men dispense their medicines.

I am, Sir, yours respectfully,

JOHN MILLS, A.P.S.

Biarritz, France, July 25th, 1870.

"RULE OF THUMB."

Sir,—In this week's issue of the Journal you state "nothing is more delusive than the eye as a measure of the weight of powders." Why, may I ask, is the eye more liable to delusion in this kind of measuring than in that of *distance*, or any other kind of measuring? Is a rifleman necessarily a good "shot" one day and a poor "shot" another day; or can he in this particular act trust to his eye on Saturday afternoon as well as on Saturday morning; and cannot bulk be measured with as much accuracy as distance? I know a carpenter who never uses his rule for measurements less than six inches, and may not the pharmacist, with a tutored eye, dispense with his scales in the weighing of 1 or 2 gr. powder?

After all, what matters it whether or not the scales are used if the most potent ingredient in these patent medicine powders be no more than sacch. lact.? There is far too much precision required in dispensing ingredients which are almost inert? Besides, there is next to nothing in "*dose.*"

ANTI-HUMBUG IN DISPENSING.

Aberdare, July 23, 1870.

[*** The ease of measuring lines or distance is much simpler than that of measuring irregular solids, such as little heaps of powder. In the actual instance quoted by us the practical effect of guessing was, that an infant would get sometimes half a grain and sometimes a whole grain of calomel; but since our correspondent objects to precision, and thinks there is nothing in dose, perhaps he will not attach much importance to that.—ED. PH. J.]

"*Echo*" informs "R. R." (Leighton Buzzard) that the correct rendering of the sentence criticized at page 60 of the number for July 16th, would be "With Messrs. ——' compliments, soliciting the favour of *Mr. or Messrs.* ——' orders." If *your* is used, the sentence must be in the letter form, commencing "Dear Sir," or "Gentlemen." (For *druggists* read *drug lists.*)

Ignoramus writes, "I have found in my house some curious little things—toys, I suppose; small hollow metal balls, the size of peas. Each ball is fastened, by means of fine wire, to a little capillary glass tube as a handle; they are in a box labelled 'Fil d'Arehal.' Will you, or some of your readers, be good enough to inform me of their properties?" Perhaps some of our readers can give the desired information.

A Minor Associate writes complaining of the M.D. who, in a recent number of the 'Lancet,' criticized the presence of druggists at "Mr. Squire's cutaneous assembly at the Polytechnic," and considers that invidious distinctions should be avoided by those attending such lectures for instruction.

O. J. (Teignmouth) should apply to the Admiralty for information.

C. N.—The following is the formula:—

℞. Savon blanc, 96 grm.
Carbonate de Potasse, 1 grm.
Alcohol (21°), 384 grm.
Mix, and filter the solution.

H. W. Maleham (Sheffield).—Handed to the Secretary.

J. S. (Edinburgh) will find, in the advertising columns of the Journal, particulars as to the price of the index.

C. G. (Leamington).—Parrish's 'Pharmacy,' Pereira, 'Selecta e Præscriptis,' Thomas's 'Medical Dictionary' would probably suffice. We know of no single book containing the information required.

R. J. (Southport).—The proportion of phosphate of iron in the syrup is 1 grain in the drachm; the proportion of hypophosphite of iron in the syrup of hypophosphate is 2 grains in the drachm.

Inquirer (Birmingham).—The proportion of benzoin in ung. zinci benz. is 10 grains to the ounce of lard. (See Vol. XIV. p. 207.)

Spot Stroke (Torquay).—Inquiries are being made as to this matter, and we hope soon to have full information.

H. L. (Brighton) and *J. C. Thesh* (Pontefract) should apply at the War Office.

W. M. Spooner (Witham).—Not on any account.

F. F. (Manchester).—1. Siebe's refrigerator worked with ether answers well. 2. Apprenticeship is not necessary.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W.*

ALCOHOLIC FERMENTATION.

BY BARON VON LIEBIG.

(*Continued from p.* 84.)

It has already been mentioned that many organic compounds are known which undergo, in presence of water, alteration and metamorphosis having a certain duration, and ultimately terminating in putrefaction; while other organic substances that are not liable to such alteration by themselves, nevertheless suffer a similar displacement or separation of their molecules when brought in contact with the former, like sugar in contact with yeast; but without the aid of vital action.

When the molecular work, or the metamorphosis of the cell-contents ceases, its action upon sugar ceases likewise; thus, for example, yeast may be kept for many months in a weak solution of creasote,* carbolic acid,† or other solution containing a certain amount of alcohol and acid, like wine, without any reduction of its efficacy.

It is intelligible that the products formed from the nitrogenous and sulphuretted constituents of yeast in the fermentation of yeast alone, cannot be identical with those formed from it by contact with sugar, because the sugar, penetrating into the cells, reacts upon the contents, and thus the re-arrangement of the particles of nitrogenous substance is effected. Moreover, the liquid filtered from yeast submitted to fermentation by itself is rich in nitrogenous substances, and it is very suitable for cell production.

I have mentioned that yeast loses its power of fermenting when exposed to a temperature of 60° C.; in like manner active fermentation in a saccharine liquid is stopped when the liquid is heated to 60° C., and it does not recommence again on cooling the liquid. Pasteur's admirable method of making wine keep by heating it to 60° C., appears to be in some way connected with this influence of heat upon yeast.

I have observed that during the putrefaction of yeast, the power of producing fermentation in sugar solution is retained for a long time. The point at which putrefaction sets in is easily recognizable when the yeast is mixed with some nitre solution. While fermenting alone or with sugar solution, no alteration of the nitre is caused; but so soon as putrefaction begins, the nitrate is converted into nitrite, and on testing some of the liquid with starch, iodide of potassium, and dilute sulphuric acid, a deep blue colour is produced.

A quantity of yeast was left for five weeks after the commencement of putrefaction, and every four days a portion of it was added to sugar solution. Even after it had passed into an extremely putrid state, it produced fermentation, and then the bad smell disappeared gradually. However, the quantity of alcohol formed became less, and there were formed besides carbonic acid, other products that I have not yet examined.

In reference to the formation and development of the yeast-fungus, Pasteur has made an observation which has given a new direction to the views previously entertained.

It was supposed that yeast was developed like other fungi, which, as parasites, derive their constituents from plant or animal remains, especially that its propagation and multiplication required albuminates, or some derivative of them besides phosphates.

Pasteur's experiments, however, leave no doubt that yeast may develope in mixtures containing tartrate of ammonia, sugar, and the cell-constituents of yeast.

It is astonishing that this discovery has not attracted more attention in regard to a special point, for it comprises a fact of very great significance for physiology, viz., the formation of albuminate in plants, respecting which we are in possession of scarcely anything beyond conjectures; hitherto this has been regarded as one of the greatest mysteries in organic nature.

We have regarded the organic acids in plants—oxalic, malic, citric, etc.—as the intermediate substances between carbonic acid and sugar, starch, cellulose, etc., by means of which the gradual transition from carbonic acid to a plant-constituent is effected; but in the food plants, which contain the largest amounts of albuminates, we do not find any nitrogenous substance besides ammonia that can be connected with the formation of the albuminates.

This problem appeared to be solved by the experiments of Pasteur; for if yeast-cells, placed in a mixture of ammonia, tartaric acid, sugar, and phosphate, could propagate and multiply, it is evident that an albuminate must have been formed from the elements of this mixture, since one of the chief constituents of the yeast-fungus is an albuminate, and in each of the new yeast-cells there must be a certain quantity of freshly-produced albuminate present, without the presence of which no true yeast-cell could have been formed.

Twenty-five years ago I directed attention to the possibility that albumen in plants might be formed by combination of ammonia with sugar, attended with elimination of water.

$$\left.\begin{array}{ll}\text{Sugar . .} & C_{48}H_{48}O_{48} \\ \text{Ammonia} & \quad\;\; H_{18} \quad\;\; N_{6}\end{array}\right\} = \left\{\begin{array}{ll}\text{Protein .} & C_{48}H_{36}O_{14}N_{6} \\ \text{Oxygen.} & \qquad\qquad O_{4} \\ \text{Water .} & \qquad\; H_{30}O_{30}\end{array}\right.$$

$$\overline{C_{48}H_{66}O_{48}N_{6}} \qquad\qquad \overline{C_{48}H_{66}O_{48}N_{6}}$$

The substance here referred to under the name of protein contains the same elements as casein, united in the same proportions, leaving out of consideration sulphur, the precise origin of which I am not able to account for.

The idea of the production of an albuminate from ammonia and sugar was not therefore at all surprising to me, but rather familiar than otherwise; nevertheless, I could not readily conceive such a mode of formation to obtain in a fungus, for it would not be possible without elimination of oxygen from the sugar, while the yeast-fungus grows in the total absence of light, and up to the present time no evolution of oxygen has been observed in the growth of fungi.

On closer consideration of the experiments which preceded Pasteur's chief experiments, and led him to them, it is scarcely possible to suppress some misgivings. Thus, for instance, Pasteur added to a sugar solution some tartrate of ammonia, and, after fermentation, he found less ammonia than he had added, inferring thence that the missing ammonia had entered into combination and contributed to the production of yeast. The details of the three

* Béchamp.

† Dr. v. Pettenkofer.

* In a note on the origin of albumen, Ann. Ch. Ph. li. 287

chief experiments made in reference to the disappearance of ammonia are the following:—

I. 100 grm. sugar, dissolved in a litre of yeast-water, mixed with a trace of yeast, and left to ferment.

The yeast-water contained	·038	grm. ammonia.
The fermented liquid contained	·020	"
Deficiency	·018	"

II. 100 grm. sugar, 10 of fresh yeast, mixed with ·2 tartrate of ammonia. The liquid contained—

Before fermentation	·0185	grm. ammonia.
After fermentation	·0015	"
Deficiency	·0170	"

III. 19·575 grm. sugar, ·525 yeast, and ·475 tartrate of ammonia. The liquid contained—

Before fermentation..........	·088	grm. ammonia.
After fermentation	·071	"
Deficiency	·017	"

In these three experiments, the quantities of ammonia in the fermented liquids were in the ratio, 1 : 2 : 5, and it is rather striking, that the deficiencies were nearly the same in all three instances. It is, moreover, not easily explicable that, in these three experiments, a part of the ammonia should have served for the production of a nitrogenous constituent, while in the fermented liquid there was still a residue of nitrogenous substances, which are admirably suited as food for yeast-cells, and certainly much more so than ammonia; in fact, the fermentation would have gone on just the same in the three mixtures without any addition of ammonia.

The constancy in the loss of ammonia, notwithstanding the dissimilar quantities of ammonia, would appear rather to indicate an error in the method of determination common to all the experiments; but I will not lay any stress on this supposition. The confirmation of the most important thing, viz. the increase of yeast by the ammonia in the fermented mixture, has been left entirely unheeded by Pasteur.

It is clear that if he had added an ammonia salt to one of two mixtures of a known quantity of sugar with the same quantity of yeast-water and a trace of yeast, he should, in the two cases, have found a difference in the quantity of yeast produced. If the ammonia had been applicable for the production of yeast, the mixture with ammonia should have yielded more yeast than the others without ammonia.

The capability of ammonia to serve for the formation of yeast is, therefore, not inferred from the fact that the quantity of yeast was increased in the presence of ammonia, but from the fact, that the determination of ammonia in the fermented liquid showed a loss. The only satisfactory evidence in favour of Pasteur's view, that the ammonia contributed to the formation of yeast is, as already stated, yet to be furnished.

The experiments of Duclaux * seem to admit of the inference, that ammonia has no influence on the formation of yeast. He fermented 40 grm. of sugar with 15 grm. yeast and 1 grm. dextro-tartrate of ammonia, and found that the yeast was reduced from 2·5011 grm. to 2·326 grm., or about 8 per cent., as in Pasteur's experiment without ammonia. But in all liquids that contain material adapted for feeding yeast, there is an increase in the quantity of yeast. However, I will not lay any further weight on these considerations, but will turn to Pasteur's main experiments, by which he believes that the formation of yeast from non-nitrogenous substances and ammonia has been directly proved.

When a mixture of 10 grm. sugar, 100 c.c. water, ·100 grm. tartrate of ammonia, and ·075 to ·080 grm. yeast-ash, was mixed with a trace of yeast, evolution of carbonic acid commenced in a few hours; the sugar was partially decomposed and the yeast increased; ·0062 grm. of ammonia had disappeared (= 5·2 milligrams nitrogen), while the yeast produced weighed ·043 grm., and this should have contained the nitrogen of the ammonia, or upwards of 11 per cent. of nitrogen. Pasteur has described very minutely the progress of this experiment, and I believe it is possible to infer with tolerable certainty from his account, that there was essentially no vinous fermentation, but that a true lactic fermentation took place. There was, indeed, a sensible production of alcohol, but I suspect that the quantity of alcohol was not determined by him, because it was too small. However, 4·5 grm. sugar was decomposed, and it was, for the most part, converted into an organic acid, equivalent to ·597 sulphuric acid. This organic acid consisted chiefly of lactic acid.

I have many times repeated this experiment with great care, and obtained nearly the same results as Pasteur so far as relates to the formation and increase of the yeast. The only alteration that I made in the mixture consisted in heating the liquid to boiling, and allowing it to cool in the vessel before adding the yeast. In another instance I took sugar that had previously been heated to 160° C., at which temperature it is known not to lose its capability of fermenting.* I also found that, after twenty-four hours, some carbonic acid was evolved, and that the greater part of the sugar was converted into an organic acid, the nature of which was not determined.

From one of these mixtures I distilled off 25 c.c., and determined the specific gravity of the distillate to be ·99968, or scarcely different from that of water. By means of Lieben's delicate test, however, alcohol could be detected in it.

There is no doubt that, under these conditions, a decomposition takes place, and that there is some formation of alcohol, which probably originates from the yeast added, although its quantity is so small. But the whole process has no resemblance to that taking place in a sugar solution, to which so much nitrogenous substance has been added, as would correspond to the nitrogen of ·1 grm. neutral tartrate of ammonia (= 15·2 milligrams nitrogen). For instance, in a mixture of 100 c.c. sugar solution, containing 5 grm. sugar and 16 c.c. of a decoction of fresh yeast, there was, after adding a trace of yeast, in eight hours a sensible fermentation; successive bubbles of carbonic acid were evolved slowly but continuously, while the bottom of the vessel became covered with a distinct layer of very white yeast, that increased in thickness until all the sugar was decomposed.

I am fully conscious that, in researches of this kind, a negative argument does not excite any special confidence, for it does not require any particular art not

* 'Comptes Rendus,' lix. 450.

* According to analyses made by Prof. Volhard at the instigation of Prof. Nägeli, the whitest and most transparent crystals of sugar always contain nearly ·5 per cent. of nitrogen.

to obtain the result another experimenter declares he has obtained, while want of skill and care in the execution of difficult experiments are sufficient to cause discrepancies; but I believe that I have not neglected any precaution, and moreover Professor Nägeli, to whom I gave a mixture prepared exactly according to Pasteur's directions, has not been more successful than I was.

Considerations of another kind induced me to discontinue these experiments without losing more time over them.*

It must be noticed that, although Pasteur weighed the deposit formed in his experiments, he has not furnished any evidence that the 43 milligrams obtained was true beer-yeast. He should have brought that deposit into contact with sugar-water, to show that it really consisted of *Torvula cerevisiæ*, and it should have caused sugar to ferment. The microscope is a very untrustworthy instrument for determining the real nature of such things as this. To judge from the proportionately large quantity of lactic acid formed from sugar in Pasteur's experiments, the seeds of *Torvula cerevisiæ* must have given rise to lactic ferment, viz. *Penicillium glaucum*, and the deposit must have consisted of this.

It is surprising that Pasteur claims to have produced beer-yeast in mixtures that did not contain any sulphur. There is no such thing as beer-yeast that does not contain sulphur; its chief constituent is a nitrogenous substance containing as much sulphur as casein does, or even more.

Neither sugar nor tartrate of ammonia contain sulphur, and even yeast ash is generally free from sulphur. That which I used did contain a trace of sulphuric acid, but even if it had contained a considerable amount, the assumption that the yeast plant possessed the capability of decomposing sulphuric acid would have been admissible only if it had been distinctly proved that true beer yeast could have been produced in Pasteur's mixtures. I look forward to this proof with the greatest interest, and, if Pasteur should succeed in obtaining it, we shall have gained an exceedingly important piece of information in reference to plant physiology, either that there is beer yeast not containing any sulphur, or that fungi have the power of decomposing sulphuric acid, and of producing an albuminate from its sulphur, together with ammonia and the elements of sugar or tartaric acid. This is a power which has hitherto been regarded as belonging only to green plants under the influence of light.

The fact that Pasteur, in determining the ammonia in his fermented mixtures, found less than he had added to them, cannot possibly be relied on as evidence that this ammonia served as food for the growth of yeast; for I must again point out, that in no single instance has he shown the formation of true yeast or its increase to be due to the presence of ammonia in the fermenting liquid.†

In carrying out the plan adopted by Pasteur for separating ammonia from fermented liquids by boiling them with calcined magnesia, I have repeatedly obtained less ammonia than the liquid contained; but, in such instances, the deficiency of ammonia was recognizable in the residual magnesia having formed ammonio-phosphate of magnesia in consequence of the presence of soluble alkaline phosphates, which are never wanting in fermented liquids.

Pasteur has also discussed the question as to what becomes of the nitrogen of yeast in fermentation; he says, "In vinous fermentation there is not the slightest formation of ammonia at the expense of yeast." * This statement is, however, inconsistent with that on the previous page, to the effect that a litre of water, containing the soluble constituents of yeast, yielded ·038 grm. of ammonia. I find, moreover, that all fermented liquids contain ammonia, though certainly a very minute quantity. It seems as if nitrogen were excreted in some other form, partly, perhaps, as organic bases. I have been unable to detect leucin in the fermented residues, probably because its amount is too small. Ludwig has found trimethylamin in all the varieties of wine examined by him; and Oser, likewise, has described a very remarkable nitrogenous base, destitute of oxygen, as being a constant product of the fermentation of sugar with yeast. According to his experiments, this base appears to be a constant product of the fermentation of cane sugar.

In the wine districts of France, where many thousands of gallons of wine are distilled in the manufacture of brandy, the residues of this operation would probably be a rich material for investigation, in regard to the non-volatile products of fermentation, and they would probably constitute a source of interesting discoveries. Moreover, if it be the case, as Pasteur states, that for each litre of alcohol produced in fermentation, there is also formed 50 grm. of glycerin, it is possible that glycerin might be extracted from these residues with advantage.

Recent researches on the causes of fermentation and putrefaction have been prosecuted essentially under the influence of the ideas—entertained by Turpin, Cagniard-Latour, Mitscherlich, and others—which prevailed in the minds of many physiologists thirty years ago and have been recalled by Pasteur within the last ten years.

Turpin states, as the result of his microscopic investigation of beer fermentation and acetous fermentation, that "under fermentation is to be understood a joint action of water and living bodies which feed and develope by the assimilation of a constituent of sugar, while, at the same time, eliminating from it alcohol or acetic acid; a purely physiological action that commences and ends with the existence of infusorial plants or animalcules whose life ceases only when the nutritive saccharine materials are totally exhausted."† It is impossible to detect any difference between the fundamental views of Turpin and those of Pasteur.

Inasmuch as Pasteur has again diverted the study of fermentation and putrefaction by microscopists into the old objectless path, the result has been, that the general aspect of these processes has been disregarded, the phenomena that are common to all of them have been overlooked. Observation

* It is well known that in ammoniacal salts of organic acids there is often a spontaneous decomposition accompanied by formation of mould, without any addition of ferment.

† My late friend Pelouze communicated to me, some nine years since, the results of Pasteur's investigations, and I then remarked to him, that I did not perceive anything to induce alteration in my views respecting the cause of fermentation,—adding, that if it were possible, by the aid of ammonia, to produce yeast in fermenting liquids, or to increase its quantity, this possibility would soon be turned to account, and that I would await such a result; but, up to the present time, the industrial preparation of yeast has not altered.

* Page 380.

† Ann. Chem. Pharm. 1839, xxix. 100.

it has been directed to the search for mere details, and has thus become incoherent. This tendency has prevailed so far that special causes are sought for each of these innumerable processes, for each one, in fact, there has been found a particular species of fungus or animal, and this is likewise the case for many diseases, such as cholera, etc. In this way we have attained to such a point, that we are no longer able to comprehend how it is that, in the presence of these enemies, the organic world continues to exist. If we ask the microscopic investigator what is really the nature of the ferments which give rise to lactic, butyric, and other acids, we receive as an answer the names of certain species of fungi!

Though probably no one will dispute the utility of microscopic observations, it is, nevertheless, indispensable to recognize the fact that "causes" are not to be seen, even with microscopes. Observations of that nature are well calculated to define the limits of things that participate in a process, and to direct investigation to the part they take in it; but the supposition that the whole affair is at an end when something has been found of which we have no further knowledge, is sufficient evidence that the true value of physiological facts is misconceived.

All putrefaction-ferments, when left for a time, give rise to the formation of butyric acid from their own elements, and they excite butyric fermentation in other materials which are susceptible of such change, just in the same way that yeast, when left to itself, produces alcohol and excites vinous fermentation when placed in sugar solution. From the fact that, under certain conditions, yeast excites lactic fermentation instead of vinous fermentation, it may be inferred with great probability, that under those conditions, lactic acid is actually produced in the yeast instead of alcohol. Salicin, a glucoside, breaks up in contact with emulsin into saligenin and sugar, but in the presence of yeast and carbonate of lime it breaks up into saligenin and lactic acid. These facts are, I conceive, indications that admit of our hoping to come, by means of properly conducted investigation, somewhat nearer to the causes of these changes.

The production of succinic acid and glycerine appears to be indicative of a fermentation going on simultaneously with the vinous fermentation; it is evidently analogous to the fermentation processes in which lactic acid is formed from sugar or mannite and sometimes butyric acid, from lactic acid. It is possible that the detection of a small quantity of hydrogen in the carbonic acid evolved, might lead to further elucidation. Mannite and glycerine differ only in the amount of hydrogen they contain.

I have regarded the phenomena of fermentation and putrefaction from a totally different point of view, and have considered their elucidation as the bridge by means of which we may arrive at a more exact knowledge of the processes taking place in the organisms of animals and plants.* Who can, at the present time, fail to perceive the significance of these facts, in regard to the conception and explanation of many vital processes? If a change in the locality and relative position of the elementary particles of animal substances, outside the organism, be capable of exerting a very definite influence upon a number of organic substances which are brought in contact with them, if those substances are thereby decomposed, while new compounds are formed from their elements, and if it be considered that the class of substances susceptible of such changes as take place in fermentation, comprises all those which are constituents of the food of man and animals,—who can doubt that the same causes act one of the most important parts in the vital process, or that they have a powerful share in the alterations which the materials of food undergo when they are converted into fat, blood, or constituents of organs! We know, indeed, that there is in all parts of the living animal body an incessant change going on; that living particles of the body are eliminated; that their constituents, whether fibrin, albumen, gelatin, or whatever else they may be, rearrange themselves as new compounds; that their elements unite to form new products. In accordance with our experience we must presume that in virtue of this activity, there is, at all places where it obtains, and corresponding to its direction and intensity, a parallel alteration in the character and composition of constituents of the blood, or of food, coming in contact with such changing particles—that consequently the animal metamorphosis is itself a main cause of the alterations that the food undergoes, and a determining condition of the nutritive process; that with every pathological variation in the metamorphosis of an organ or a gland, or any constituent of them, the action of that organ upon the blood coming in contact with it, or upon the character of its secretion, is also altered; that the action of many therapeutic agents depends on the share they take in the metamorphosis, and that they exercise an influence on the quality of the blood, or of the food, chiefly in virtue of the circumstance that they alter for a time the direction and power of the activity obtaining in the organs, either accelerating, retarding, or stopping it?

* Ann. Chem. Pharm. lxii. 263.

UNTO-MOOL.

Tylophora asthmatica, W. and A.

BY M. C. COOKE.

Recently it has been proposed to introduce and cultivate ipecacuanha in India, on a large scale, for medical purposes, as has been done with cinchona. It would be well to inquire, before such a step be taken, whether any of the known indigenous products affords a good substitute for the officinal plant. It is probable that the evidence already collected is insufficient; but it would be comparatively easy to test the value of such drugs as we may name prior to any extensive experiment on acclimatization.

The Natural Order *Asclepiadeæ*, contains several plants with the reputation of possessing emetic virtues, some of them equal to ipecacuanha. Of these, the root of the "mudar," *Calotropis gigantea*, has been named. The emetic properties of mudar root have been vouched for by several good medical authorities, amongst whom may be mentioned Sir W. O'Shaughnessy, Dr. Bonavia, Dr. Hutchinson, Dr. Æ. Ross, Dr. Newton, Dr. Stewart, and others. On the other hand, it is admitted that precaution must be taken to dig the root at the proper season and to prepare it in a certain manner, or it is liable to prove inert.

Then, again, *Secamone emetica*, R. Br., has been mentioned, as regarded by the natives highly for its emetic properties; but the only trial which has been recorded was unsatisfactory, inasmuch as it was almost inert. It is not impossible that, in this instance also, due regard was not had to the season at which it was collected.

The root of *Asclepias curassavica*, L., called 'Bastard Ipecacuanha,' introduced into India, certainly has a reputation in the West Indies and elsewhere as an emetic. Its use appears, however, to be attended by disadvantages, such as powerful action on the bowels, which would militate against its regular use.

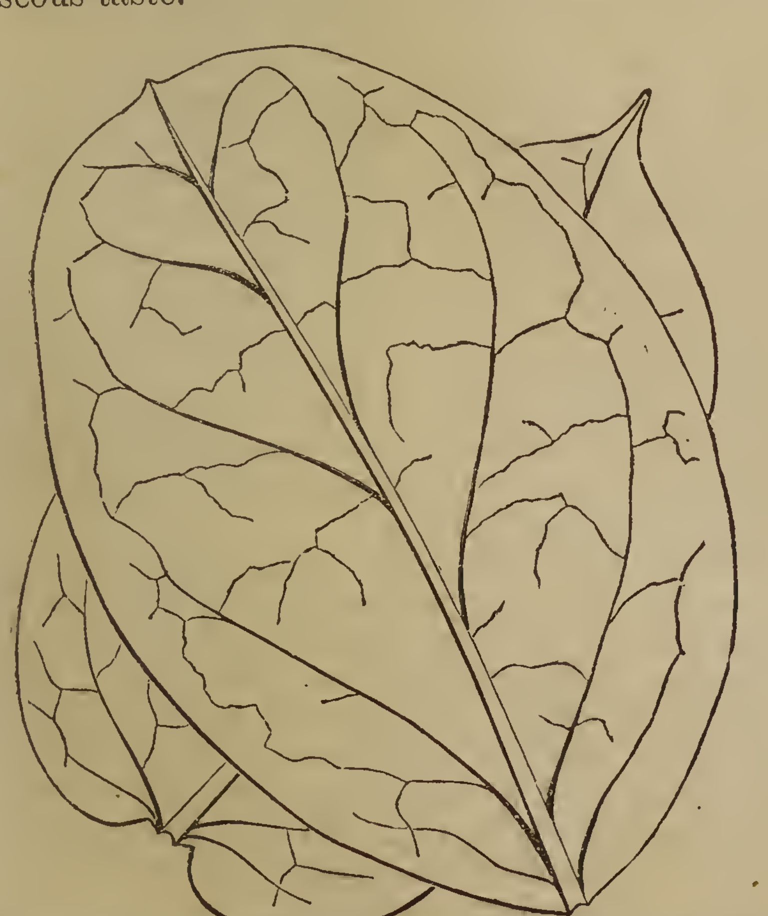
Besides these, *Dæmia extensa*, R. Br., and the leaves of *Hoya viridiflora*, R. Br., enjoy a reputation amongst the natives as emetics, but they do not appear to have been efficiently tested.

Finally, the root and leaves of *Tylophora asthmatica*, W. and A., have been strongly recommended, and this is probably the safest and best of all the remedies here enumerated. The leaves are included in the new 'Pharmacopœia of India' as a primary article, and the evidence goes to show that they are an excellent substitute for ipecacuanha.

This plant is the *Asclepias asthmatica* of Roxburgh, and the *Cynanchum* of other authors. It is called 'Unto-mool' in Bengali, 'Kaka-pulla' of the Teloogoos, and the 'Codegam' or 'Coorinja' of the Tamils. In the Mauritius it is known as 'Ipéca du pays,' or 'Ipéca sauvage.' It is a twining plant, from 6 to 12 feet in height, with opposite, ovate-roundish, acuminate leaves, which are cordate at the base, smooth above and downy beneath; the peduncles are short, with two or three sessile, few-flowered umbels; the flowers are rather large, on long pedicels, externally pale green, with a faint tinge of purple, internally light purple.

This is a very abundant and widely diffused plant in India, being to be met with in nearly all situations, and in flower at all seasons. Is very liable to variation, so as to be difficult to characterize, but may be readily known from an allied species by the reddish or dull pink flowers and the toothed leaflets of the crown.

The *root* is sold in the bazaars in thick, contorted pieces of a pale colour, and a bitterish, somewhat nauseous taste.



The dried *leaves* are from two to three inches in length, entire, ovate-roundish, acuminate at the apex, cordate at the base. The older or lower leaves are scarcely acuminate, and rather rounded than cordate at the base. They have rather a glaucous appearance, with a heavy, disagreeable smell when bruised, and a nauseous taste.

Dr. Kirkpatrick, after remarking that the powdered root and juice are used by the people of Mysore as an emetic, adds, "I have administered this medicine in at least a thousand cases, and found it most valuable. In dysentery, and as a simple emetic, it is in every way comparable with ipecacuanha. The dose is from twenty to thirty grains, with half a grain, or a grain, of tartar emetic, if strong emesis is required. If the dysentery distinctly arise from intermittent disease, quinine is conjoined. The form of the medicine I use is the powder of the dry leaf. If the root were used, the supply would soon be exhausted; besides, I have found it less certain than the leaf. The preparation of the juice would at all times be troublesome and tedious. In catarrhal and chronic coughs it seems to act well. Its efficiency as a substitute for ipecacuanha, not only as a simple emetic but as a remedy in dysentery, asthma, and catarrhal affections, is confirmed by the report of Dr. Oswald, Mr. Moodeen Sheriff, and others. According to the latter, the best treatment of snake-bites consists in producing free emesis by the expressed juice of this plant, and following up its use with diffusible stimulants."

Roxburgh says that "on the coast of Coromandel the roots have often been used as a substitute for ipecacuanha. I have often prescribed it myself, and always found it answer as well as I could expect ipecacuanha to do. I have also often had very favourable reports of its effects from others. It was a very useful medicine with our Europeans who were unfortunately prisoners with Hyder Ali during the war of 1780–3. In a pretty large dose it answered as an emetic, in smaller doses often repeated, as a cathartic, and in both ways very effectually." Other authors add that the natives employ the root as an emetic by rubbing upon a stone three or four inches of the fresh root, and mixing it with a little water for a dose. It generally purges at the same time.

The leaves are considered preferable to the root, —in fact, the leaves only are recommended, in the Pharmacopœia of India. The dose there stated is,—as an emetic, from five-and-twenty to thirty grains of the powder of the dried leaves, conjoined with half a grain or a grain of tartar emetic; as a diaphoretic and expectorant, from three to five grains, thrice daily, or oftener, combined with opium, and other remedies of the same class. It is also stated on the authority of the same work, that this is one of the best indigenous (Indian) substitutes for ipecacuanha. It is easy enough to obtain this drug from India, and it certainly seems worthy of consideration whether it should not also be fairly tried in this country.

OPHELIA CHIRAYTA.

BY FLÜCKIGER AND HÖHN.

This plant is little known in Europe, and is not much used even in England, although it has a place in the British Pharmacopœia of 1867, as well as in that of the United States of 1866. But in India Chirayta has long been in high repute, and it is generally sold in the bazaars. It is also mentioned among the large number of medicinal agents comprised in the 'Systema Medicinæ' of Susrutas about ten centuries before our era. The Sanskrit name is *Kiratatikta*, or the bitter herb of the Kiratas, a half-caste race that had been driven back into the hill country of northern India. It is with good reason, therefore, that this plant has always received attention from English physicians in India, and that it has been included in the Indian Pharmacopœia of 1868.

Strangely enough, Guibourt attempted to refer to *Chirayta* several of the older descriptions and drawings of the *Calamus aromaticus, odoratus*, or *verus* that was brought at an early period from India to Europe. It is true he pointed out the total absence of aroma, so that the remarks of Fée and Royle sufficed to prove the total difference between the odourless *Chirayta* and *Calamus*, although the history of the latter is not yet fully ascertained.

This plant from which this bitter herb is derived —*Ophelia chirata*, Griseb.—was first drawn by Roxburgh in 1814, under the name *Gentiana Chirayta*; subsequently also by Wallich, by Don (as *Agathotes Chirayta*), by Wight, and Cleghorn. It is an elegant annual *Gentiana* of the lower Himalaya, occurring from Simla, and through Kumasu, as far as Nepaul. In its outward appearance *Ophelia Chirayta* closely resembles our *Erythræa Centaurium*, though with several differences.

The Chirayta commonly met with in English commerce is usually of very inferior character, and chiefly consists of stalks deprived of their leaves. The plant that has been examined by Höhn consisted, on the contrary, of well-preserved specimens retaining flowers, fruit, and roots, so that the essential characteristics of that nature could be well observed. For the supply of this material I am indebted to the kindness of my friend Daniel Hanbury.

The woody stems were from 2 to 3 feet long, and ¼ inch thick at the lower ends, cylindrical, with knots at distances of 1½ to 3 or 4 inches, at the upper ends obtusely quadrangular, with wings extending downwards. The colours varied from brownish-yellow to dark purple-red. The branches were more greenish or greyish-brown. The root is sometimes from 2 to 4 feet long, and twice as thick as the stem. It forms generally a simple tap-root, furnished with somewhat scanty fibres. Larger specimens present an angular bending of the root, probably indicating a growth of more than one year. Generally the stem rises isolated from the root, but in some instances I met with plants consisting of several stems. The numerous prolonged branches resemble in their arrangement those of *Erythræa Centaurium*, and towards the upper part they form a thick whorl. The insertion of the leaves and flowers may also be compared to that of the indigenous Gentian referred to above. The lower leaves of *Ophelia* are often 3 cm. in length and 7 mm. broad; the upper ones are very much smaller. All of them are acutely lancet-shaped, smooth edged, cordate at the base, and, like the entire plant, perfectly glabrous. According to the size of the leaves, they present 3, 5, or 7 ribs, of which the central one is the thickest.

The yellow, 4-parted corolla is about 12 mm. long, and rather glandular at the base. The calyx is much shorter than the corona. The fruit is a 1-celled capsule, with two valves at the apex.

* Derived from ὄφελος, useful, in reference to the medicinal virtue of the plant.

The flower possesses the same intense bitter taste that is characteristic of Chirayta. It is only the woody substance of the thickest stems that is not bitter; this contains a considerable pith. Even the branches present in sections a broad ring.

The popular name of this drug in India is *Creyat*, and it has been applied to several varieties of *Ophelia*; but it seems that *Andrographis paniculata*, Wallich (*Justicia paniculata*, Burm.), an *Acanthacea*, frequent in Bengal, is principally understood under that name (or, properly, *Kiratha*). This plant, which is only 1 or 2 feet high, also tastes intensely bitter, but it is distinguishable by its alternate, long-stemmed flowers, with rose-coloured bilabiate corolla. Moreover, the flower forms a panicle.

While *Ophelia Chirayta* is distinguished as *dukhani*, or southern Chiretta or Creyat, the *Ophelia angustifolia*, Don, is, on the contrary, termed *pahari* Chiretta, as coming from the mountains. This variety grows in the same districts as the true Chirayta; but it has leaves that are almost lineal, and the flowers have a white corona, with violet spots, that is shorter than the calyx.

On the contrary, *Ophelia elegans*, Wight, is indigenous to the mountains of southern India, and in the bazaars of that district it is described as inland Creyat. It has blue flowers.

Lastly, the Indian Pharmacopœia mentions the white-flowered *O. densifolia*, Griseb. (*O. multiflora*, Dalzell). All these varieties are described as quite as bitter as the true Chirayta, and as being, in fact, used in the place of it throughout the north-western, central, and southern provinces of India.

These varieties of *Ophelia* correspond in their native country to the allied indigenous European plants which have been introduced into medical use here, and from that point of view their investigation by Höhn presents some pharmaceutical interest. In the Indian Pharmacopœia there is an infusion of Chirayta, and an aromatic tincture with cardamoms and orange-peel.

By extracting the stalks and roots with alcohol of 60 per cent. sugar, wax, chlorophyll, soft resin, tannin, an acid (ophelic), and a pecular bitter substance (chiratin) were dissolved.

The acid was syrupy, and very deliquescent, yellowish-brown, tasting at first slightly sour, afterwards intensely bitter. When warmed it smells like lugian; it dissolves in water with some turbidity (due, perhaps, to resin), completely in alcohol, or a mixture of spirit with ether. It decomposes alkaline solution of copper when warmed with it; also ammoniacal solution of silver with alkalies it darkens; with perchloride of iron it becomes reddish-yellow; with sulphate of copper dirty green; with lead salts yellow, and forms amorphous compounds with acids. Analysis of the lead compound gave $C_{26}H_{20}O_{20}$ as the formula.

Chiratin is a pale yellow, very hygroscopic powder, at the utmost capable only of a granular crystallization; it is very bitter, sparingly soluble in cold water, rather more in hot water, readily soluble in alcohol or ether. It is neutral to test-paper, does not reduce alkaline solution of copper, and gives with tannic acid a copious white flocculent precipitate; formula $C_{52}H_{48}O_{30}$. By the action of acids chiratin is separated into ophelic acid and a yellowish-brown amorphous substance that is not sugar, but tastes bitter, is scarcely soluble in water, readily soluble in spirit, does not reduce copper solution.

Höhn assigns to it the formula $C_{26}H_{24}O_6$, and the name Chiratogenin.

The herb itself gave the same results as the stem and roots.

HYDRATE OF CHLORAL.

BY C. UMNEY, F.C.S.

Reference has already been made in the leading journals of medicine, chemistry, and pharmacy to a compound of chloral with alcohol.

Recently this alcoholate of chloral has found its way into commerce, and has been offered for sale as hydrate, at a much lower rate than the market value of true hydrate of chloral.

It is highly important that the alcoholate should be distinguished from the hydrate, not only because it yields upon decomposition a smaller proportion of chloroform, but because Dr. O. Liebreich and other therapeutists who have experimented with it affirm that its medicinal properties are dissimilar to those of the hydrate.

The object of this communication is to give to pharmacists the details of a quantitative test for determining the chloroform value of any specimen of either of these chloral compounds which may pass through their hands.

a. Hydrate of Chloral.—Take 500 grains of the salt, and dissolve in about 1 ounce of distilled water; transfer to a 1000-grain graduated tube, and make up the measure of the solution to 700 grain-measures; to this add solution of caustic ammonia (·891) until the whole measures 1000 grains. Agitate; immerse the tube in warm water, to assist the reaction, and set aside for twelve hours.

Upon examination, the fluid will be found to have perfectly separated into two layers, the lower being chloroform (from fine specimens of the hydrate nearly colourless), the upper, a deep, sherry-coloured solution of formiate of ammonia.

The volume of the chloroform layer should not be less than 235 grain-measures, which, calculated at the sp. gr. of chloroform (1·497), would give 351·7 grains by weight, a quantity equal to about 70 per cent. (70·3) of the chloral compound employed.

β. Alcoholate of Chloral.—Proceed as in testing the hydrate. The chloroform layer will be about 200 grain-measures, or by weight 299 grains, an equivalent of about 60 per cent. by weight (59·8) of the chloral alcoholate. Such a difference, it must be apparent, is of great importance, as the physiological action of chloral is principally due to its transformation into chloroform in the blood.

An eye accustomed to the rate of solution of the hydrate in water can soon detect the alcoholate by its much less solubility. The hydrate in detached crystals,* resembling crystals of sulphate of magnesia, is a much more soluble form than the ordinary hydrate in masses; it will also produce upon decomposition with ammonia 70 per cent. by weight of chloroform.

The difference in the boiling-point of the hydrate (95° Cent.) and of the alcoholate (116° Cent.) is alone almost sufficient to distinguish one from the other. At any rate, this characteristic, combined with the quantitative chloroform test, is quite sufficient to enable the pharmacist to give with accuracy an opinion upon the purity of any chloral hydrate.

Laboratory, 40, *Aldersgate Street, E.C.*

* Hanbury, Pharm. Journ., May, 1870.

OINTMENT OF MERCURIC NITRATE.

BY R. ROTHER.

One of the most serious imperfections of the Pharmacopœia is its process for the ointment of mercuric nitrate. This is a failure in every respect, the nomenclature not excepted. The ever-recurring difficulties that the officinal formula engenders have caused the accumulation of abundant literature designed to obviate or remove some of these inherent obstacles. But even the enumeration of all the known processes has been of no avail. Most of the modifications that have been suggested are based upon the officinal process itself, and consist mainly of alterations in the proportion of the ingredients or their quality. But the officinal process is in the full sense of the term irrational; likewise must be any other which grounds itself upon this. Therefore, the solution of this profound problem cannot be discovered in the components of the formula, but must be sought for in the operation alone. A review of all the known facts connected with the history of this preparation reveals as follows:—Firstly, since the value of this combination is generally recognized, the title should be distinctive of its character. In this regard the Pharmacopœia completely fails. If the solution of the metal is officinally effected in the contact with the acid at the ordinary temperature, it is positively certain that both mercuric and mercurous nitrate form even in the large surplus of acid shown by the precipitation of mercurous chloride in the presence of chlorhydric acid, consequently the ointment will receive both nitrates from the beginning. Evidently, the lower the temperature at which the solution is made, the greater will be the proportion of mercurous nitrate, in the same ratio the remaining acid, and through it the more powerful the oxidation of the fats. But the intenser the reaction, the more probable will be the reduction of the mercurial salts, and especially the mercurous nitrate, which is eminently dissimilar in its effects and molecular constitution to the mercuric salt. The following equations will sufficiently illustrate the above:—

$$3\,Hg + 8\,(NO_3H) = 3\,((NO_3)_2Hg'') + N_2O_2 + 4\,OH_2$$
$$6\,Hg + 8\,(NO_3H) = 3\,((NO_3)_2Hg_2) + N_2O_2 + 4\,OH_2.$$

When these mercurial solutions come in contact with the heated glycerides, the complicated reaction which immediately ensues commences with two distinct phases. One of these is characteristic only for the so-called non-drying oils; the other is pretty general with all. The first of these is determined by the catalytic action of the nitrogen tetroxide (which is always present in the mercurial solution prepared without heat, and should it not be present, as would be the case by employing a solution containing the mercuric nitrate only, it would, of course, simultaneously result from the mutual decomposition of the nitric acid and the facts), and consists in the transformation of the liquid triolein into its white concrete and crystalline isomere elaidin. But the second, which is characterized by the violent evolution of volatile products, consists, according to the prolongation of the reaction or its intensity, favoured by external causes, and the relative quantity of nitric acid, of the destruction of part of the oleic, palmitic and stearic acid contained in the glycerides that are usually employed.

But the complete dissociation of the original compounds is effected with difficulty. Pure lard, heated with eight and ten times the quantity of strong nitric acid until the latter was dissipated, still was attacked by a fresh portion. In this case, all of the nine volatile acids of the series $C_nH_{2n}O_2$, from acetic to capric inclusive, are produced together with fixed acids of the series $C_nH_{2n-2}O_4$, of which suberic and succinic acid are more abundantly produced from glycerides containing chiefly palmitin. A peculiar and undetermined substance is invariably generated in quantity, and resists the destructive action of the nitric acid with remarkable obstinacy. This is an intensely yellow oil, which saponifies with potassium hydrate, with the formation of a deep red colour; and it is this compound to which the ointment of mercurial nitrate owes its yellow colour. It is supposed that the discoloration of the officinal ointment occurs more particularly when the oxidation of the fatty matter has not been sufficient, and that subsequently the avidity of these bodies robs the mercurial salts of their oxygen and reduces them to the metallic state; but in the officinal ointment the greater part of the mercury no longer exists as normal nitrate, but chiefly as basic nitrate and mercurous or mercuric salts of some of the fatty acids either originally existing in the fat or as products of its decomposition. This is amply evidenced by employing a drying oil, as the oils of cotton or flax-seed, in the preparation of the ointment, which of course, as will be seen, are entirely inadmissible for this purpose. If flax-seed oil, for instance, is heated with nitric acid alone, even until the latter is entirely consumed, no separation will take place; but if to the heated oil the mercurial solution be added, a greenish-yellow agglutinated mass immediately separates, which adheres to the bottom of the vessel and the stirrer too tenaciously to admit of distribution, and moreover hardens on cooling to the consistence of lead plaster. Strong cold nitric acid has no apparent action on this substance; neither have oil of turpentine, alcohol, ether, and carbon disulphide, when repeatedly treated with these solvents in succession; but chloroform dissolves the greater part of it, leaving a greyish, light, flocculent deposit, which agglutinates on the addition of alcohol. Cold strong nitric acid attacks this powerfully, forming a green solution containing abundance of mercuric oxide. At the same time a yellow oily substance separates, which completely dissolves in chloroform—also in ether, but slowly and imperfectly in alcohol—to an intense yellow colour, and saponifies with potassium hydrate to a deep red colour. The original resinous substance, as it separates from the supernatant oily liquid, is but faintly acted on by cold strong nitric acid; but the same acid, when hot, dissolves all but a yellow oil, which separates from the solution, and contains mercury in abundance, as the black precipitate with ammonium sulphide indicates. The first chloroformic solution of the resinous deposit, when evaporated, leaves a reddish-yellow varnish-like residue, which is insoluble in water, but readily saponifies with potassium hydrate to a red solution, whilst a small quantity of mercurous oxide at the same time separates. By the addition of nitric acid to a solution of this soap, a yellow precipitate again occurs.

The separation of this resinous deposit at the very outset of the operation, goes to show how easily the mercurial nitrates are reduced by heat, or, more particularly, by the combined influence of temperature and the reducing property of the organic substances, even in the presence of a large excess of free nitric acid, which seems to indicate, in this instance at least, that the replacement of the hydrogen atom of the acid molecule through the mercurial atom, renders it more unstable in the presence of organic matter, and, therefore a more powerful oxidizer.

The evolution of nitrogen dioxide during the solution of the resinous remnant, insoluble in chloroform would also indicate that the body contained either metallic mercury or the suboxide. This supports the supposition that the mercurous compounds are less stable than the mercuric under similar circumstances. It also affords incontrovertible evidence that in the officinal ointment the smallest portion of the mercury exists as nitrate, and that the greater portion can be present in an indefinite variety of forms. Therefore, the only form in which the metal should be combined is as mercuric nitrate, and the title should designate it accordingly.

Secondly, a portion of the fatty substance which the formula demands cannot be obtained, unless the pharmaceutist prepares it himself, because an officinal neat's-foot oil does not exist in the market, but a rank and disgusting semi-fluid grease, which possesses none of the officinal characteristics. But pure lard can always be readily obtained, and, since it furnishes an excellent ointment, should invariably be used.

Thirdly, the manner of executing the officinal operation is the very embodiment of failure. In this process it is of the utmost necessity to employ vessels of immense proportionate size. It is a point of great importance to retain the temperature of the heated fats within certain limits, which is an exceedingly difficult office to perform after a violent reaction has set in; and even with all these precautions the ointment may overflow or its colour be impaired from reduction of the metal by too great a heat. The production of a good ointment by this process is therefore a matter of chance, and depends upon circumstances that seem rather the good luck of the operator than a well-defined pharmaceutical process.

Now, all these difficulties can be readily overcome by an entire change in the operation itself, regardless of the component elements of the formula. The new process rests upon a scientific basis, whose characteristic feature pervades it in every detail, and which must therefore invariably yield a uniform and definite result. Two parallel operations, separate and distinct, unite their perfect results to one complete and unchangeable whole. The formation of mercuric nitrate is effected with the requisite quantity of nitric acid, and the remainder is completely consumed in the oxidation of the fats. This ensures the ultimate existence of but one compound of mercury in the finished product, and that is, as the title implies, the mercuric nitrate. It likewise admits of the oxidation of the fatty matter to the utmost capacity of all the available nitric acid, so that when the last vestige of this has disappeared the mercurial solution can be mixed with the nearly-cooled product without causing any further reaction. A very decided advantage of this process is that the enormously large vessels can be dispensed with. The nitric acid is added to the melted fat, and the heat continued until brisk ebullition sets in. This occurs mainly in the centre of the mixture, and without frothing. It is, however, of the utmost necessity not to disturb the liquids by stirring. If the reaction becomes too violent, the mixture must be removed a short time from the fire; and if the action slackens too much, it must be replaced. Finally, when all the nitric acid has been decomposed, the temperature can be considerably raised without causing any further effervescence. The boiling then is analogous to the boiling of fatty matters in general.

From the foregoing results the following formula is deduced:—

Take of Mercury................	$1\frac{1}{2}$	troy ounces.
Nitric Acid, sp. gr. 1·42 ..	$3\frac{1}{2}$	,,
Lard (pure)	$16\frac{1}{2}$	,,

Dissolve the mercury in 900 grains of the nitric acid, with the aid of heat, and keep the solution gently warm to prevent crystallization before it is used. Melt the lard in a suitable vessel with a moderate heat; then add the remainder of the nitric acid, and continue the heat, *without* stirring the mixture, as long as moderate effervescence continues; but if this becomes too violent, remove the mixture from the fire, and only replace it when the action slackens too much. Finally, when effervescence ceases and the liquid only boils, even under an increased heat, remove the mixture from the fire altogether; and when it begins to stiffen, add the mercurial solution, and mix thoroughly.—*The Chicago Pharmacist.*

Prevention of "Pitting" in Smallpox.—As a means of preventing the disfigurement attending this disease, a writer in 'Union Médicale' recommends the painting of the pustules, as soon as the eruption appears, with tincture of iodine. The application should be continued for five or six days.

REPORT ON CINCHONA CULTIVATION IN BENGAL.

From C. B. Clarke, Esq., M.A., *Officiating Superintendent, Botanic Garden, and in charge of Cinchona cultivation in Bengal, to the Secretary to the Government of Bengal,—(No.* 188, *dated Botanic Garden, Calcutta, the* 29*th April*, 1870).

Sir,—I beg leave to submit the annual report on the cultivation of Cinchona in Bengal for the year ending 31st March, 1870.

2. The three species of cinchona of which the cultivation has been extended during the year are *C. succirubra*, *C. officinalis*, and *C. calisaya*.

The number of plants of these species in permanent plantations were as under:—

	C. succirubra.	*C. officinalis.*	*C. calisaya.*
March 31, 1869	615,730	312,719	220
March 31, 1870	1,055,100	406,899	4,000
Increase	439,370	94,180	3,780

3. The increase of permanent plantation of *C. succirubra* and *C. calisaya* has been made about Rishap at an elevation of 2500 feet; the increase of *C. officinalis* at Rungbee at an elevation of about 4500 feet.

4. The average growth for the year of the ten measured plants of *C. succirubra* planted in March, 1867, at Rishap, has been 51 inches, which fairly represents the satisfactory general growth of the *C. succirubra* plantations.

5. The average growth for the year of the ten measured plants of *C. officinalis* planted in October, 1864, at Rungbee, has been 12 inches, which fairly represents the unsatisfactory general growth of the *C. officinalis* plantations.

6. The average growth for the year of the ten measured plants of *C. calisaya* planted in June, 1867, at Rishap, has been 52 inches, which represents the average growth of all the plants in the plantation catalogued as *C. calisaya*. But several important varieties are included under the name *C. calisaya*, and the tree variety raised by seed in February, 1867, and planted out in June, 1867, has attained a height of 12 feet in October, 1869, and a tree of this age, lately cut down, has produced two pounds of dry bark.

7. As fully explained by Dr. T. Anderson in his annual cinchona report in Bengal for the year ending 31st March, 1868, the exceeding steepness of the hills, combined with the large rainfall, prevents any tilth on these cinchona plantations. The grass and low jungle having been cut close, the young cinchona plants are planted out in the permanent plantations. The weeds having been merely headed down, not eradicated, grow with great strength in a moist and warm climate, and continual scouring of the young plantations is necessary. This is the chief expense under thissystemofcultivation.

8. *C. succirubra* and *C. calisaya* (tree variety) grow so freely, that by the third year the young trees in the plantations are all locked; they then crush the jungle beneath them, and can take care of themselves, and little further expense upon them is called for.

9. But *C. officinalis* shows no inclination to become a tree at these plantations; it remains a shrub with very scanty foliage, and even on the plantations which are five years old, there continues the same expenditure in scouring.

10. *C. succirubra* and *C. calisaya* are planted about 1200 to the acre; *C. officinalis* about 4000 to the acre.

11. In the fifth year of growth in permanent plantation an acre of *C. officinalis* carries less than one-fourth the bark carried by an acre of *C. succirubra*, and costs more than four times as much annual expenditure. Moreover, the *C. officinalis* then appears disinclined to grow much larger, whereas *C. succirubra* will clearly grow into a considerable tree.

12. I calculate that at present it has not been discovered how to grow *C. officinalis* to economic profit at Rungbee. I therefore stopped its extension in September last, though I was aware of the high quality of the grey bark. The present quantity is large for an experiment; and, as an experiment, a few acres of *C. officinalis* were planted in September last at a somewhat higher level (5000 feet) than the main plantation. Also, in all the *C. officinalis* plantations below the level of 4000 feet (above which level *C. succirubra* does not thrive), *C. succirubra* has been planted between the ranks of *C. officinalis*, and will, doubtless, soon overgrow it.

13. The propagation and extension of *C. calisaya* has been pushed as fast as possible. There is no difficulty in multiplying *C. succirubra* and *C. officinalis* by cuttings, but at Rishap there is found the greatest difficulty and uncertainty in multiplying *C. calisaya* by cuttings. Herr von Gorkom, the Director of the Dutch Government cinchona cultivation in Java, informs me that there the same difficulty with *C. calisaya* is found; but, on the other hand, Mr. M'Ivor, in the drier climate of the Nilgherries, says cuttings strike with perfect success.

14. Herr von Gorkom has sent me on several occasions most valuable packets of *C. calisaya* seed, which germinated excellently; but if it could be discovered how to grow *C. calisaya* by cuttings, I should greatly prefer that method, as by it I am sure of getting exactly the variety which I wish to propagate. Mr. M'Ivor is of opinion, that not merely do the varieties cross freely, but that many hybrids are formed from different species of cinchona.

15. The most valuable bark known in the European market is the *C. calisaya* bark; this species grows admirably at Rishap, and, during the past year, propagation has been almost entirely confined to it. In growing for profit, I believe it will ultimately be found advisable to grow one or two species only on these plantations; and that it is best to discard a species at once which is clearly inferior with us to *C. calisaya* and *C. succirubra*.

16. I have lately brought from the Nilgherries two new kinds of cinchona, one provisionally named *C. mirabilis*, of Mr. Broughton, the other *C. pitayo*. In *C. mirabilis* the bark contains the astonishing quantity of 13½ per cent. of quinine alkaloid, and more than 9 per cent. of crystallizable quinine. *C. pitayo* is a rich bark from Peru, a very high-level species, said to be found growing through the snow.

17. During the year both *C. succirubra* and *C. officinalis* ripened seeds; 5¾ ounces of the former and 5¼ ounces of the latter were distributed. One ounce of seed will raise nearly 50,000 plants.

18. There were distributed from Rungbee during the past financial year cinchona plants as under:—

	C. succirubra.	*C. calisaya.*	*C. officinalis.*
Mr. Werniche, Kursiong ..	2500	50	..
Dr. Jameson, Saharunpore .	1500	260	500
Mr. Robson, Tukvar	..	200	..
Col. Strutt, Kangra Valley .	..	12	..
Total	4000	522	500

19. The amount of propagation having been greatly reduced, a considerable number of the old frames and glass were sold. The receipts for the past year of the cinchona plantation paid into the Darjeeling treasury were as under:—

	Rs.	As.	P.
Rent from land let	1130	0	0
Price of a wardian case	10	0	0
Sale of cinchona plants	156	4	0
Sale of old glass	187	8	0
Total	1483	12	0

20. The total expenditure for the year on the Sikhim cinchona cultivation was Rs. 50,224, being Rs. 18,642 less than the estimate, and Rs. 18,040 less than that of the preceding year.

21. The *C. succirubra* trees stand 6 feet by 6 in the plantations, and, as an experiment in January last, a small portion of the denser plantation was thinned by cutting down three trees out of every four. This was found to produce 300 lbs. of dried bark, worth about Rs. 250 per acre.

22. At the same time a considerable portion of the more advanced trees were pruned by the removal of the lower branches. There was stored from the thinnings and prunings in all 2400 lbs. of dried bark.

23. The only private plantation in Sikhim, which (so far as I know) is extending cinchona planting on a considerable scale, is that of Mr. Lloyd and Colonel Angus, known as the Darjeeling Cinchona Association, and which occupies the north side of the Rungbee valley. This Association now has about 500 acres of permanent plantation of *C. succirubra*, and has cut a considerable quantity of three-year-old bark during the late cold weather, and sold it in the London market.

24. The Government cinchona plantation at Nunklow, in the Khasi Hills, was formed for the supply of cinchona plants to the planters in Assam and Cachar. Seed is now easily transmitted, and I believe the discontinuance of the plantation at Nunklow has been decided upon by Government.

Number and distribution of Cinchona plants in the Government plantations near Darjeeling on the 31*st March,* 1870.

Names of species of cinchona.	Number in permanent plantations.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in cutting beds.	Number of cuttings made during the month.	Total number of plants, cuttings, and seedlings.
C. succirubra	1,055,100	20,000	164,615	None	None	1,239,715
C. culisaya ...	4,000	10,000	8,758	32,274	2,000	57,032
C. micrantha	29,667	None	None	None	None	29,667
C. officinalis, and varieties.	406,899	10,000	205,952	307,853	Ditto	930,704
C. pahudiana	5,092	None	None	None	Ditto	5,092
Total	1,500,758	40,000	379,325	340,127	2,000	2,262,210

C. B. Clarke,
Officiating Superintendent, Botanic Garden, and in charge of cinchona cultivation in Bengal.

Conversion of Angelic into Valerianic Acid.—According to Jaffe, angelic acid is not converted into valerianic acid by means of hydriodic acid. According to Ascher, a temperature of 180° to 200° C. is needed for this transformation, which does not take place at low temperatures. By heating together angelic acid, red phosphorus, and hydriodic acid to 180° to 200° C., for the space of eight hours, a complete transformation into valerianic acid was effected. As our readers will know, angelic acid differs from valerianic acid by two equivalents of hydrogen, which, according to the foregoing account, it acquires from the hydriodic acid.

Determination of the Value of Cinchona Bark.—The methods of determining the value of cinchona bark may be divided into two classes, viz. those which give the total amount of alkaloids all together, without distinguishing between them, and those which give the amount of pure quinine. Those belonging to the former class may, in fact, be regarded as abandoned, because they are calculated to assign the same value to bark containing only modified and uncrystallizable alkaloids as to bark containing a corresponding amount of pure quinine.

The methods most practised for determining pure quinine are based upon the use of ether or chloroform for purifying the quinine to be determined, or, in other words, they represent, as quinine, all the alkaloid soluble in ether and chloroform. It may be stated, without much need of examination, that these methods are calculated to lead to serious errors. For instance, is it not evident that by this use of ether, bark containing only aricine, may be regarded as of good quality, inasmuch as that alkaloid is soluble in ether? Moreover, the inadequacy of these methods may be demonstrated in a manner entirely different. All manufacturers of quinine have been led to abandon them on account of the loss experienced in many instances to a large extent. They have purchased as rich, samples of bark that yielded only small quantities of quinine. At the present time manufacturers have adopted the plan of determining the value of bark by means of a miniature operation, conducted in the same way as the manufacture on a large scale. This, it must be admitted, is the most judicious method, and probably the only one that can be depended on.

Though the method suggested by M. Carles is not open to the objections raised against those formerly in use, we do not consider that it should be preferred to that just mentioned for the purposes of manufacturers. At the same time it may be useful for pharmacists, since it is more accurate than others.

His method consists in determining quinine in the state of crystallized sulphate, after its separation from other alkaloids whose sulphates are more soluble. Moreover, by the use of chloroform as a solvent, and the separation of resins by means of dilute sulphuric acid, it is possible to obtain sulphate of quinine in a very satisfactory state of purity and whiteness.

The chief disadvantage of the method consists in relying too much on a slight artifice, by means of which the soluble sulphate of quinine is converted into crystals by washing with ammonia. This is an operation requiring some dexterity in manipulation. It is also to be regretted that M. Carles has not determined the solubility of the sulphate in the mother liquors obtained in the operation, for since they contain sulphates of other alkaloids, they may also contain some quinine.*

Fatal Case of Poisoning of a Man and a Horse.—In the August number of the 'Journal of Botany' is a short notice of a rapidly fatal case of poisoning by *Œnanthe crocata*. This is an umbelliferous plant of common occurrence in the south of England, and has frequently been eaten by mistake for other allied plants with fatal effects. In the present instance, it was mistaken for "wild parsnip" by a carter, who thought himself afflicted with "scurvy." The man ate some of the root whilst at work, and about an hour after he fell back foaming at the mouth, and black in the face. He died before the arrival of medical aid about half an hour after the first effects, one hour and a half after the ingestion of the poison. On *post-mortem* examination, about "half a small cupful" of the masticated root was found in the stomach. The horse to which the man had given some of the root lived half an hour longer than the man. *Œnanthe crocata* belongs to that group of narcotico-acrid poisons comprising the *Solanaceæ*, and characterized by producing convulsions with delirium. Death may even occur more rapidly than in the above case. It is of interest to note, as the point is one which has been several times observed, that the juice of the plant was yellow in colour. It has been said that the state of the plant with a colourless juice is less virulent in its nature.

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* Extract from the Report of a Commission consisting of MM. Gobley, Roussin, and Jungfleisch.

The Pharmaceutical Journal.

SATURDAY, AUGUST 6, 1870.

THE POISON REGULATIONS.

In drawing attention last week to the remarks of the 'Pall Mall Gazette' anent the privileges and duties of the Pharmaceutical Society, we were not influenced by any idea of an unkind spirit prompting our contemporary; indeed, we thought he desired rather to utter a kindly warning, more pleasantly expressed than other observations on the same subjects which we have read within the last three months: but straws in the air indicate the course of the wind, and it is sometimes well to mark their direction.

In days gone by, chemists and druggists were too insignificant a class to attract attention from other members of society; invested with privileges, they became worthy of observation. Privileges are never granted without duties being imposed on the recipients, and their fulfilment at once furnishes an object for criticism.

When we are reminded that "all monopolies are to be regarded with distrust, and watched with anxiety in the public interest," that our Society "has public duties and private interests to consult, and the two may not always concur," we cannot fail to recognize the fact that the eye of the press—which we may call one of the great lenses of the public—is upon us.

We know that the public safety can in no way be better promoted than by aiding the education and enforcing the examination of men to whom the dispensing of dangerous medicines is entrusted. The Pharmaceutical Society enunciated that as a principle thirty years ago, and has ever since faithfully, earnestly, and at great cost, laboured to carry it out. When Poison Bills were brought before Parliament based on other foundations than education, every effort was made, and made successfully, to defeat them; but when that principle was adopted, the Society joined heart and hand to promote it.

Now it cannot be doubted that the public, scarcely conversant with the intricacies of the subject, see greater security in what they may perhaps call the "*material guarantee*" of "*Poison regulations.*" We on the other hand regard them as secondary, but still important, means of safety, so important, indeed, that scarcely an opponent of the code proposed by the Council for the consideration of the Annual Meeting could deny that in his own establishment some such precautions were in use. The opposition was not grounded on objection to the regulations themselves, but simply on a dislike to have any system made compulsory. Those who came to oppose forgot apparently that there are, and will be until another generation has succeeded the present, men in business as Chemists and Druggists, whose qualifications have not been proved by examination, and in disinclination to accept for themselves any *possibility* of inconvenience, they gave the outer world reason to suspect that the latter half of the twofold position described by the 'Pall Mall Gazette' had more weight with them than the former. Such an inference was rather strengthened by the assertion of some that it was useless to ordain regulations for chemists if the same rules were not to be compulsory on apothecaries.

We certainly cannot recur to the proceedings of that stormy day with any satisfaction. A discussion quite foreign to the legitimate business of the Pharmaceutical Society was forced on the meeting, and, as we believe, materially influenced the whole course of events.

We do not intend now to enter on the merits of the proposed regulations; ample opportunity will be found for that, between this and next May, to which time the matter stands postponed, but we desire rather to remind our readers that the Pharmaceutical Society is a public body; that it is a part of the State Government, and if it fall short of its duty, a fair question for discussion will arise as to how far it has fulfilled that part of the contract to which it is bound by the Pharmacy Acts of 1852 and 1868. These are points which should be pondered on quietly at home; with pots, bottles, and general shop arrangements at hand, to show what would be the comparative merits or demerits of the proposed system, or what other system could be suggested as an additional alternative to the three already set forth, and for such reasons we invited those who had propositions to offer, to communicate them to us for publication in this Journal and for criticism by others.

THE PETROLEUM ACT.

Our readers will be glad to learn that a Bill to amend the Petroleum Act is now before the House of Lords, and that it contains provisions for exempting the articles sold under the name of "Benzine Collas," and such fancy titles, secured in small bottles and labelled with words of caution.

This is the exemption which was promised by the Home Secretary when the Pharmaceutical Society, accompanied by Mr. Thomas, represented to him the hardship and annoyance to which retailers were exposed.

It was feared that the Government had further postponed the question.

The 'Times' states, in reference to this Bill, that—

"According to the view of the leading persons engaged in the business, its clauses are such as would completely interrupt this important branch of commerce; and strong representations have therefore been made to some of the principal mercantile members of the House of Commons to prevent its being passed without full consideration when it shall come down to that House."

In reporting the accident that occurred at Bradford, of which an account is given in another part of this Journal, the 'Pall Mall Gazette' remarks that "the substance known as benzoline seems to be little less dangerous to handle than paraffin."

It is almost incredible to meet with such ignorance as that displayed by this remark, and it serves in some measure to account for the accidents that happen with the dangerous volatile spirit called benzoline. The case of Mr. Taylor seems to suggest the need for an alteration in the Petroleum Bill now before the House of Lords, and that, in the label to be attached to bottles containing volatile spirit, "Great care must be taken *in bringing* any light near to the contents," etc., the words in italics should be replaced by "not to bring."

The Juries Bill, as amended in Committee, contains the following clause:—

"13. If any overseer, without reasonable excuse to be allowed by the justice or justices having cognizance of the case, insert in the list of persons qualified to serve as jurors prepared by him the name of any person whose name ought not to have been inserted therein, or omit therefrom the name of any person whose name ought not to have been omitted, he shall, on summary conviction, be liable to a penalty for each offence not exceeding forty shillings."

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

July 29th, 1870.

Present—Messrs. Allchin, Bird, Edwards, Gale, Garle, Haselden, Ince, and Southall.

Thirty-one candidates were examined; the following passed, and were duly registered:—

MODIFIED (as Chemists and Druggists).

Baynes, James, junior . . . . Brighton.
Burn, Thomas . . . . Hartlepool.
Campbell, John. . . . . Bristol.
Dodds, John Henderson . . . . . . Walsall.
Elkington, Charles John. . . . . . Birmingham.
Grindell, John . . . . London.
Hartley, Stephen . . . . Ulverstone.
Holmes, Frederick George . . . . Brill.
Jarvis, John . . . . Pau.
Jones, George Coverdale. . . . . . Bournemouth.
King, Abraham . . . . Bristol.
Metcalfe, Alfred . . . . East Retford.
Oldham, Gervase . . . . Stockport.
Presley, Edward . . . . Bristol.
Siminson, Henry . . . . Kidderminster.
Simmons, Alfred . . . . Redditch.
Thyer, James . . . . Leamington.
Veitch, William, junior . . . . . . Shildon.
Wheeler, Frederick . . . . Guildford.
Wright, William John . . . . . . Tunbridge Wells.
Young, Jonathan . . . . Cambridge.

MINOR (as a Chemist and Druggist).

Banks, Benjamin . . . . Folkestone.

FIRST, OR PRELIMINARY EXAMINATION.

The Certificates of Examination of the undermentioned were accepted in lieu of the Preliminary Examination:—

Amoore, Lewis Perigo. . . . . Hastings.
Atkinson, John George . . . . . . Horncastle.

Provincial Transactions.

EXETER BRANCH PHARMACEUTICAL SOCIETY.

A Special Meeting of the members of the above Society was held on Friday, the 29th July, on the occasion of the receipt of the gift of books presented to the Society at the British Pharmaceutical Conference, held in Exeter last year, by T. H. Hills, Esq., and termed in memory of the late Jacob Bell, the "Bell and Hills' Library Fund."

The following is the list of works received:—5 vols. of Watts' 'Dictionary of Chemistry;' 1 vol. of Fownes' 'Chemistry;' 1 vol. of Attfield's 'Chemistry;' 1 vol. of Hooker's 'British Flora;' 1 vol. of Royle's 'Materia Medica;' their handsome appearance, and the very appropriate design on the cover of each, viz. "Bell and Hills'," etc., elicited expressions of great satisfaction.

After allusions to the generous gift, and to the great advantages to be derived from the addition to the existing library of such works for the younger students, the class which it was especially the intention of the donor to benefit, it was resolved and carried unanimously, "That the thanks of the Society be given for the above valuable works, and that the Secretary be requested to communicate this resolution to T. H. Hills, Esq.

Parliamentary and Law Proceedings.

A BILL INTITULED AN ACT TO AMEND THE PETROLEUM ACTS 1862 AND 1868.

33 & 34 Vict.

Whereas it is expedient to amend the law relating to the sale and keeping of petroleum and other substances of the like nature:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited as the Petroleum Act, 1870.

2. This Act shall be construed as one with the Petroleum Acts, 1862, 1868, and those Acts and this Act may be cited together as the Petroleum Acts, 1862 to 1870.

3. Section 4 of the Petroleum Act, 1868, shall not apply to petroleum kept by a dealer for sale by retail, if such dealer comply with the following conditions, namely:

(1.) That the petroleum is kept in separate glass, earthenware, or metal bottles, each of which contains not more than half a pint, and is securely corked; and

(2.) That the aggregate amount of petroleum kept by the dealer, supposing the whole contents of the bottles to be in bulk, does not exceed three gallons; and

(3.) That each bottle has attached thereto a label in legible characters stating as follows: "Great care must be taken in bringing any light near to the contents of this vessel, as they give off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer."

Every dealer who acts in contravention of any of the above conditions shall be liable to the forfeiture and penalty prescribed by section 4 of the Petroleum Act, 1868.

4. Any officer authorized by the local authority may purchase petroleum from any dealer in it, or may, on producing a copy of his appointment, purporting to be certified by the clerk or some member of the local authority, or producing some other sufficient authority, require the dealer to show him all or any of the vessels in which petroleum in his possession is stored, and the place

of the storage thereof, and to give him samples of such petroleum on payment of the value of such samples.

When the officer has by either of the means aforesaid taken samples of petroleum, he may declare in writing to the dealer that he is about to test the same, or cause the same to be tested, in manner provided by this Act, and it shall be lawful for him to test the same or cause the same to be tested, at any convenient place at such reasonable time as he may appoint, and the dealer or any person appointed by him may be present at the testing; and if it appear to the officer or other person so testing that the petroleum from which such samples have been taken has been kept, offered, or exposed for sale contrary to the Petroleum Acts, 1862 to 1870, such officer or other person may certify such fact, and the certificate so given shall be receivable as evidence in any proceedings that may be taken against a dealer in petroleum in pursuance of those Acts; but it shall be lawful for a dealer proceeded against to give evidence to show that such certificate is incorrect, and thereupon the court before which any such proceedings may be taken may appoint some person skilled in testing petroleum to examine the samples to which such certificate relates, and to declare whether such certificate is correct or incorrect.

Any expenses incurred in testing any petroleum of such dealer in pursuance of this section shall, if such dealer be convicted of keeping, selling, or exposing for sale petroleum in contravention of the Petroleum Acts, 1862 to 1870, be deemed to be a portion of the costs of the proceedings against him, and shall be paid by him accordingly. In any other event such expenses shall be paid by the local authority out of any funds for the time being in their hands.

5. The temperature at which petroleum gives off an inflammable vapour shall for the purposes of the Petroleum Acts, 1862 to 1870, be tested in manner set forth in the schedule to this Act.

6. Any petroleum sold or exposed for sale in contravention of section 5 of the Petroleum Act, 1868, shall be liable to be seized, and upon conviction of the person selling or exposing for sale the same to be forfeited.

7. Sections 6 and 8 of the Petroleum Act, 1868, and the schedule to that Act, are hereby repealed.

Schedule.

Directions for Applying the Flashing Test to Samples of Petroleum Oil.

The cup which is to hold the oil shall be of thin sheet iron or of metal blackened on its inner surface; it shall be two inches deep and two inches wide at the opening, tapering slightly towards the bottom; it shall have a flat rim projecting from the edge of the cup, by which it shall be supported in a metallic vessel four inches and a half deep and four inches and a half in diameter; it shall also have a wire stretched across the opening, which wire shall be so fixed to the edge of the cup that the upper side of the wire shall be a quarter of an inch above the upper side of a circular wire, which shall be fastened round the inside of the cup a quarter of an inch below its upper edge. The thermometer to be used shall have a round bulb about half an inch in diameter, and shall be graduated upon the scale of Fahrenheit, every ten degrees occupying not less than half an inch upon the scale.

When the instrument is to be used, the petroleum to be tested shall be poured into the cup till the liquid rises just to the upper side of the circular wire. The outer vessel shall be filled to within an inch of its edge with water, and a small flame shall be applied to the bottom of the outer vessel. When the temperature of the water has risen to 80° the cup which contains the oil to be tested shall be placed in the outer vessel, and the thermometer shall be inserted into the oil, so that the bottom of the bulb shall be immersed about one inch and a half beneath the surface. A covered screen blackened on the inside, and provided with a hole in the cover for the passage of the stem of the thermometer, shall be placed over the apparatus, and shall be of such dimensions as to surround it about two-thirds, and to reach about eight inches above the level of the vessels. The temperature shall be raised gradually, so that it shall require about five minutes to raise the oil from 80° to 95°.

When heat has been applied to the water until the thermometer has risen to about 90° Fahrenheit, a very small flame, such as that from a piece of burning twine, shall be quickly passed across the surface of the oil on a level with the wire. If no pale blue flicker or flash is produced, the application of the flame is to be repeated for every rise of two or three degrees in the thermometer. When the flashing-point has been noted, the test shall be repeated with a fresh sample of the oil, using water at the temperature of 80° as before, withdrawing the source of heat from the outer vessel when the temperature approaches that noted in the first experiment, and applying the flame test at every rise of two degrees in the thermometer.

N.B.—In performing the test, the operator must be careful not to produce any current of air which would remove the vapour from the surface of the oil, either by breathing upon the surface or by any sudden movement.

SULPHUR IN COAL-GAS.

In reference to the determination of a proper maximum for the sulphur impurity in gas, the referees appointed under the Gas Acts of 1868 and 1869 have examined the various methods hitherto proposed for purifying gas from sulphur, as well as those at present in use. The practical adoption of many of these methods is hindered, either because they inordinately diminish the illuminating power of gas, or else because the beneficial effect which they show when tried experimentally is not realized when they are applied on the large scale required in the manufacture of gas.

The present methods of sulphur-purification are so defective, that even doubling their extent in most cases produces no appreciable improvement in the purity of the gas. For example, the production of gas in summer is only one-half what it is in winter, while the purifying surface remains the same; nevertheless the referees find that while thus virtually doubling the extent of purifying material there is no appreciable effect in reducing the amount of sulphur in the gas of any of the Companies. This fact, as regards the three Companies included under the Act of 1868, is clearly shown by the daily testings now in force, which give the following averages of the amount of sulphur at mid-winter and at midsummer.

	CHARTERED.				CITY.		CENTRAL.
	Arundel Street.		Leadenhall Street.	Gray's Inn.	Cannon Street.		Friendly Place.
	Cannel.	Common.	Common.	Common.	Cannel.	Common.	Common.
December, 1869 . .	21·8	27·4	22·8	24·2	9·4	20·4	14·7
June, 1870	22·3	30·3	20·4	25·2	13·4	18·8	13·3

The referees have endeavoured to determine the relative efficacy of each of the separate stages of purification, and of each of the various processes employed by the Companies, as regards the elimination of this impurity. The results already obtained are acknowledged on all hands to be of a most unexpected nature. First, as regards the "scrubbers." It has been currently believed of late that a most efficient means of purifying the gas from sulphur was to be obtained by "scrubbing," or washing with ammoniacal liquor. Indeed, some authorities have publicly recommended that many thousand gallons of the liquor should be pumped into the scrubbers per hour. But the results of the referees' experiments, as yet obtained, show that, whether or not this opinion be theoretically correct, it is totally wrong as regards the practical efforts produced in the scrubbers in general use.*

The experiments were made with the various kinds of scrubbers employed by the several Companies. These scrubbers differ, to some extent, from one another in the arrangement of the scrubbing materials, especially as regards the nature and the distribution of the liquid employed. They also differ as regards the substances with which the scrubbers are filled: in most cases coke, or fragments of brick, being used, while in Mr. Livesey's scrubber (from which the best results were obtained) the substance employed is a network of thin boards of wood, through which, as in the other forms of the scrubber, water or ammoniacal liquor trickles down slowly through the ascending current of the gas. The experiments were conducted on a uniform system, as follows:—Just before the gas entered the scrubbers a small portion of it was drawn off, and made to pass through a box containing oxide of iron, so as wholly to remove the sulphuretted hydrogen; thereafter it was tested for sulphur. In like manner, as the gas emerged from the scrubbers a portion of it was similarly drawn off, and, after being purified from sulphuretted hydrogen, was tested for sulphur. The summary in the second column of this page will suffice for the present to show the results of these experiments so far as they have gone.

Summary of the Results of Experiments for ascertaining the effect of Scrubbers upon the Quantity of Sulphur-compounds in Gas.

	Average of	Amount of Sulphur at Inlet of Scrubbers.	Amount of Sulphur at Outlet.	Increase or Decrease at Outlet.
Great Central Company .	29 expts.	23·55	28·63	+5·06
Imperial Gas Co. (Fulham)	26 ,,	21·18	20·83	— ·35
Ditto (St. Pancras)	4 ,,	24·7	24·8	+ ·1
Ditto (Shoreditch)	3 ,,	26·35	25·30	—1·5
City of London Company .	3 ,,	22·86	25·41	+2·55
South Metropolitan Co. .	5 ,,	33·03	28·98	—4·05
Chartered Co. (Westmin.)	11 ,,	24·62	26·07	+1·45

Here it appears that only in one case did the scrubbers materially reduce the amount of "sulphur" (*i. e.* sulphur-compounds other than sulphuretted hydrogen), and in the majority of instances *more* sulphur was found in the gas when it emerged from the scrubbers than before it entered them! These facts were so unexpected and they are so contradictory of the long-established opinions and practice of gas-engineers,* that one of the gas-engineers tore up the results of his testings (which accordingly do not appear in the above table), thinking that he would only stultify himself by sending in returns which, he fancied, must be due to some mistake on his part, little expecting that they would be amply corroborated by the facts obtained by the other gas-engineers engaged in the inquiry.

There is no question as to the power of oxide of iron and lime to withdraw a large proportion of sulphur from gas under certain circumstances; but it is evident from the facts already obtained in the referees' experiments, that an adequate knowledge of how to apply these purifying materials in gasworks, so as to produce satisfactory results, has yet to be acquired.

As shown by the reports of the testings made by Dr. Letheby at the Corporation's testing-place, previous to the Act of 1868,—and thereafter from the daily testings in the five testing-stations established in conformity with the instructions of the referees under that Act,—the amount of sulphur in the gas of the Chartered, the Central, and the City companies has averaged as follows:—

Dr. Letheby's Occasional Testings—1864–68.

Year.	Central.			City.			Chartered. Curtain Road.			Chartered. Brick Lane.			Chartered. Westminster.		
	Max.	Min.	Avrge.	Max.	Min.	Avrge.	Max.	Min.	Avrge.	Max.	Min.	Avrge.	Max.	Min.	Avrge.
1864–5	35·0	16·6	21·9	29·7	14·5	19·4	33·7	14·4	20·1						
1865–6	32·9	14·4	24·1	28·2	14·2	19·6	30·7	13·0	21·2						
1866–7	29·93	14·79	21·39	24·97	7·12	17·23	27·80	10·43	17·77						
1867–8	34·61	7·43	17·44	35·34	9·19	19·06	31·96	8·79	19·57						
1868, Feb. to Aug.	32·09	8·85	14·62	25·11	10·56	17·24	23·90	14·27	19·03						
Gas Examiners' Daily Testings—1869–70.															
1869, Aug. to Dec.	37·02	4·01	12·5	26·3	12·3	19·9	27·0	8·9	20·9	33·7	17·4	24·4	36·8	14·7	28·5
1870, 6 Months .	24·9	3·4	12·7	25·1	14·6	19·7	28·3	15·8	22·3	30·1	18·6	25·0	36·7	16·6	29·2

Two explanatory remarks are necessary in connection with these statistics. Firstly, as regards the improvement that has taken place of late years in the purity of the gas of the Central Company. In the earlier years of the above series, the gas of this Company contained more sulphur than that of any of the others; and the improvement which has subsequently taken place is owing to the adoption of lime in the purifiers, instead of the oxide of iron employed by the other Companies. The works of the Central Company at Bow are in a poor locality, where there are numerous chemical and other works, which produce greater nuisances than that which arises from the use of lime in gasworks. But in the works of all the other gas companies, the use of lime as a purifier is inadmissible, owing to the nuisance which it occasions to the neighbourhood when taken out of the purifiers and exposed to the atmosphere. The works of the Imperial Company at Fulham are in a locality more thinly peopled

* The doubt suggested here by the referees involves a monstrous inconsistency, though the phraseology employed is sufficiently familiar. An opinion that is "theoretically correct" cannot be opposed to "practical experience" if the theory referred to be worth anything; but it does happen that "practical men" fail to comprehend, either the meaning of a theory or its applicability to the business they are concerned with.—Ed. Ph. J.

* The title of gas engineers to have opinions on the subject of gas-purification may fairly be said to rest solely on their technical experience in the production of gas, without being at all a result of their familiarity with, or even cognizance of the chemistry of that art, which is indeed very much in obscurity.—Ed. Ph. J.

than that around the gasworks at Bow; but the inhabitants belong to a higher and wealthier class; and when the Imperial Company, two years ago, attempted to adopt lime as a purifier in their Fulham works, the complaints made and the indictments threatened compelled the company at once to fall back upon the ordinary purifying process by oxide of iron.

The other remark necessary for a right understanding of the above statistics is, that in 1867 an improvement was made in the Letheby sulphur-test, which was used in all the above recorded testings; consequently, at any time subsequent to that improvement, the testings would show a greater amount of sulphur, even when the gas remained of the same purity as before.

"CINCHO-QUININE."

BY W. T. WENZELL, CHEMIST.

(*Read before the California Pharmaceutical Society, March 14th*, 1870.)

The article sold under the above name is stated to represent all of the alkaloids naturally contained in Calisaya bark. It is also asserted that all of the cinchona alkaloids possess equal febrifuge and tonic properties; and that quinia only acquired the rank of superiority as a febrifuge by reason of priority of discovery,—a statement which is also incorrect, inasmuch as cinchona was discovered as early as 1810 by Gomez, whereas quinia was discovered ten years later by Pelletier and Caventou. The "cincho-quinine" is said to be composed of bark alkaloids, as follows:—1. Quinia. 2. Cinchonia. 3. Quinidia. 4. Cinchonidia. 5. Other alkaloidal principles present in the bark.

The claims advanced as to its superiority over the sulphate of quinia are, namely, that "cincho-quinine" contains the whole of the active febrifuge and tonic principles of Calisaya bark; that it exerts the full effects of sulphate of quinia in the same dose, without causing cerebral disturbances; that it is nearly tasteless, and less costly than sulphate of quinia. The dose of the preparation is left to the discretion of the physician, with the direction that it may be administered in doses varying from five to thirty grains.

The apparent insolubility of the "cincho-quinine," its slight bitter taste and large medicinal dose (30 grs.), have led me to investigate the true nature of the article presented. "Cincho-quinine" is put up in imitation of sulphate of quinia in ounce bottles. It appears in the form of white friable scales, which are almost tasteless, only a slight bitterness being perceptible. When placed upon reddened litmus paper, and a drop of alcohol added, the blue colour of the litmus was promptly restored. It proved combustible without residue. When dissolved in water, with the intervention of sulphuric acid, the solution tasted analogous to one of sulphate of cinchonia, and the solution, when strongly acidulated with the acid, possessed in very slight degree only the optical phenomena of fluorescence and epipolism. Dr. Bill's test of ferrocyanide of potassium gave the known reaction for cinchonia. "Cincho-quinine" was nearly insoluble in ether. Twenty grains of the preparation were dissolved in water with a sufficient quantity of sulphuric acid, and the solution subjected to Liebig's ether test, which dissolves quinia, quinicia, and cinchonicia, also portions of quinidia and cinchonidia if a large excess of ether be employed. The etherial solution thus obtained by successive washings with ether, left on evaporation and drying a solid residue, weighing about half a grain, possessing alkaloidal properties. This residue, when dissolved in dilute sulphuric acid and water, and treated with Brande's chlorine and ammonia test, will indicate by its green coloration the presence of quinia, quinidia, and quinicia. The test responded in this instance affirmatively. In order to determine which of the alkaloids produced the coloration, one portion of the solution was tested for quinidia by Van Heijningen's test of oxalate of ammonia, and another portion was tested for quinidia by Dr. Vry's test of iodide of potassium, but both gave negative results. Therefore the alkaloid detected by Brande's test is quinicia, which was confirmed by the application of Herapath's optical and chemical tests of the iodo-sulphates of the cinchona alkaloids. One grain of the mixed alkaloids obtained by Liebig's test from "cincho-quinine" by thorough exhaustion with ether, was dissolved in a fluid drachm of water sufficiently acidulated with sulphuric acid. The solution was then mixed with an equal bulk of alcohol, the mixture warmed to about 100° F., and treated successively with tincture of iodine. The several (7) precipitates which appeared on cooling were amorphous resinous substances soluble in alcohol, and did not exhibit in the least degree crystalline structures. The precipitates first obtained were reddish in appearance, analogous to the salt of iodo-sulphate of quinicia; the last precipitates possessed the purplish tint belonging to the iodo-sulphate of cinchonicia. The absence of all crystalline characteristics of iodo-sulphate salts thus obtained from the alkaloids extracted by ether from "cincho-quinine" point conclusively to the absence of quinia, quinidia, and cinchonidia in the sample under examination; and we can safely assert that "cincho-quinine" is in reality only cinchonia containing about 2 per cent. of quinicia and cinchonicia.

"Cincho-quinine," although having the advantage of being nearly tasteless, does not contain quinia, quinidia, and cinchonidia, and therefore does not represent the whole of the active principles of the bark.

It cannot exert the full effects of sulphate of quinia in the same dose, inasmuch as the stated dose of "cincho-quinine" is from 5 to 30 grains.

Although "cincho-quinine" appears to cost less than sulphate of quinia, it does not follow that commercial "cinchonia," sold at four times its value, is a desirable substitute for quinine in an economical point of view.

And, lastly, one very important principle should by no means be lost sight of, namely, that a physician should always know what he is prescribing, and therefore the substitution of a remedy of less efficiency and uncertain medicinal value is altogether unwarrantable and often hazardous.—*Pacific Med. and Surg. Journ., April*, 1870.

SIMPLE APPARATUS FOR RAPID EVAPORIZATION AT LIMITED HEAT, UNDER REDUCED PRESSURE, WITHOUT THE USE OF A PUMP.

BY A. B. PRESCOTT,

ASSISTANT PROFESSOR OF CHEMISTRY, ETC., UNIVERSITY OF MICHIGAN, U.S.

The pump is not always at hand; its use is forbidden for transmission of corrosive vapours; and, moreover, the removal of liquids, in form of vapour, against the weight of the air by muscular power is liable to "exhaust" the operator more effectively than it does the material. I desire to ask attention to some uses of ordinary distilling apparatus for the production and maintenance of approximate vacuum over liquids during their vaporization, in cases where the heat of 120° to 150° F. may be applied.

It is necessary that the distilling apparatus be made capable of air-tight closure, and that the air be removed from it to begin with. Then the degree of exhaustion in the apparatus is in direct ratio to the rapidity of condensation of the vapour produced. And the rapidity of condensation is only limited by the degree and extent of refrigeration employed, with a given extent of evaporating surface at a stated temperature. The air in the apparatus, to begin with, may be expelled through a suitable aperture by steam, which may be generated in the "receiver" of the apparatus or in an attachment thereto.

Take two round-bottomed glass flasks, the one having a capacity four to eight times greater than the other. Adjust the smaller upon a water-bath, the larger at 10 to 15 inches distance from the other, over a sink or large basin, and connect the two with glass tubing and perforated caoutchouc stoppers, so that the connecting-tube shall incline slightly downward from its bend close to the stopper of the small flask. The stopper of the small flask is also to have a second perforation, in which is fitted a straight glass tube, 2 or 3 inches long, its lower end placed even with the lower end of the stopper. The upper end of this tube is very slightly drawn out for a quarter of an inch, and snugly fitted with 1½ inch of firm rubber tubing, the upper half inch of which is closed with a piece of glass rod of same diameter as the body of the tube.

Now put an ounce or two of water in the large flask, and the material to be evaporated in the small flask; close the stoppers perfectly by turning the flasks under them, and leave open the straight tube. Apply, by the water-bath, the limited degree of heat until it is imparted to the contents of the small flask; then move a lamp under the large flask until the water in it has boiled briskly, and the steam therefrom has escaped continuously from the straight tube for some minutes. Now close the straight tube with its caoutchouc cap, at the same time removing the lamp from the large flask. When the latter has cooled somewhat, wrap it smoothly with linen netting or gauze, and lead upon it a minute stream of cold water, controlling the same as required. The liquid in the small flask boils briskly (if aqueous, boiling at 120° or 150° F.), and the refrigeration is governed to prevent too violent ebullition, lest liquid be thrown into the connecting-tube; the degree of applied heat is governed to the same end.

An ordinary glass retort may be substituted for the small flask as an evaporating vessel, and its tubule may be fitted with a perforated stopper, admitting a thermometer. If there is not room in the stopper (of retort or flask) for both the thermometer and the steam-escape tube, the latter may be dispensed with by adjusting the stopper loose for escape of steam, and pressing it tight when the air is expelled. Flat-bottomed flasks favour equable boiling, but they are liable to collapse.

As a *condenser*, I have used, instead of the large flask, a copper vessel, for more ready application of heat without danger of breaking, and for more efficient refrigeration. This copper receiver is made of conical shape, with rounded bottom, a vertical diameter twice its horizontal diameter, and a neck bent to the angle of about 50° with the vertical axis of the vessel. The diameter of the neck is three-quarters of an inch, to receive a retort beak, the joint being covered with a section of caoutchouc tubing. Or it may be fitted with a perforated stopper, to receive the connecting-tube of the flask when evaporation is conducted in the latter.

With linen netting to spread the water over the free surface of the condensers, the evaporation therefrom refrigerates with a comparatively small supply of water. Using a copper condenser of the above-described shape, a vertical diameter of 12 inches, and capacity of 6 pints, attached to an 8-ounce glass retort containing distillation promoters, I have vaporized 4 fluid ounces of water in sixteen minutes at the constant temperature of 128° F. By ordinary care in the expulsion of air and closure of the apparatus, exhaustion can be invariably secured, fixing the water-boiling point at below 130° F.; that is, atmospheric pressure equal to at least 25 inches of mercury may be removed and sustained by availing ourselves of the displacing effect of steam, and the contraction of condensing vapour, in very simple apparatus.

Notwithstanding the illustrations of vacuum by condensation, which abound upon the physical lecture-table, I do not know whether the devices suggested in this note have been tried or proposed for small chemical operations by any one else.* I have recommended them to students, and we have found them satisfactory for various analytical, experimental, and pharmaceutical operations. We have employed them chiefly in such evaporations as are performed for the residue only, or, at least, not for the quantitative recovery of the distillate, in various evaporations of quantitative analysis, in the elimination of non-volatile alkaloids, in determining the organic matter in water, and in preparing fluid extracts. To evaporate at ordinary temperatures by hand-pump exhaustion is especially irksome in those cases when application of 125° to 150° F. is objectionable. And to connect a vessel under which heat may be applied with the air-pump involves quite as much labour as the arrangement of apparatus for exhaustion by condensation. *American Journal of Pharmacy, from American Supplement to Chem. News, Jan.* 1870.

QUALITY AND ANALYSIS OF MILK.

Dr. C. F. Chandler has published a report of the results obtained in an extended examination of the milk supplied in New York, where it appears that the Metropolitan Board of Health takes cognizance of this among questions affecting the public.

The following is an account of the method of analysis:—

1. The water is determined by evaporating a weighed quantity of milk, either alone or soaked up in a known weight of pure, fine quartz sand. The residue is carefully dried at 212° F., and weighed. The loss in weight represents the water, while the residue includes all the solid constituents.

2. The salts are determined by carefully burning off the combustible portion of the solid residue obtained by evaporation, and weighing the incombustible ash.

3. The butter and casein are determined by coagulating the milk with a few drops of acetic acid, boiling, washing the precipitate with water, and finally separating the butter with ether, leaving the casein pure. On evaporating the ether, the butter is left behind, or the butter may be extracted by ether from the residue obtained by the evaporation of a quantity of milk, soaked up in sand.

4. The sugar is generally determined by deducting the sum of the other constituents from 100. It may be directly determined by the polariscope, after the removal of the casein and butter, or it may be determined by an alkaline solution of copper.

THE ADULTERATION OF MILK.—Numerous substances are mentioned as having been used, or as supposed to be used, for adulterating milk. Prominent among these are,—

1. *Water.*—Adulteration with this substance is generally detected by the specific gravity of the milk. Pure milk varies in specific gravity from 1·023 to 1·034, water being represented by 1·000. Milk is heavier than water, on account of the casein, sugar, and salts, which it holds in solution. Butter, on the other hand, is lighter than water, therefore the specific gravity of milk increases with the percentage of casein, sugar, and salts, while it diminishes with the percentages of water or butter. It is found that good milk generally has a specific gravity of from 1·029 to 1·032. In testing milk the lower number is selected as a fair gravity for pure milk; and whenever the gravity falls below this number the milk may be considered as containing an excess of water, and consequently poor in quality or adulterated. An instrument, called a galactometer, has been devised by Dinocourt, for the purpose of testing the quality of milk. It is simply an areometer, so graduated that 100

* This method of producing a partial vacuum was employed by Barry (see U.S. Dispensatory, "Evaporation of Extracts") more than forty years ago in making extracts and volatile oils.—ED. AMER. JOURN. PHARM.

on the scale represents pure milk, or the gravity 1·029, while 0 represents pure water, or gravity 1·000, the space between being divided into 100 parts. The numbers on the scale represent, therefore, the percentages of pure milk.

Skimmed milk, having been deprived of most of its butter, is heavier than whole milk. By skimming the milk before testing it with the galactometer, the error caused by the butter is eliminated. In this case, however, the mark for 100, or pure milk, must be placed lower down on the instrument, as pure milk, having a specific gravity of 1·029, would, after being skimmed, have a gravity of about 1·033. The 100° mark for skimmed milk is, therefore, fixed at this point.

The *lactometer* is a simple tube closed at the lower end, and graduated in hundredths. It is designed to measure the quantity of cream which rises on the milk.

By using the two instruments together, the *galactometer* and the *lactometer*, very satisfactory conclusions with regard to the quality of milk, can be formed. A perfectly reliable method, though more laborious, is to actually determine the percentage of water in the milk, by evaporating a weighed quantity, and carefully drying the residue at 212° F. If a milk loses more than 88 per cent. of water, having less than 12 per cent. of solids, it may be safely pronounced to be adulterated with water.

2. *Chalk.*—This substance is generally supposed to be extensively used to neutralize the acidity in soured milk, and to produce thickness and opacity, thus concealing dilution with water. It is easily detected, as it is deposited on standing, and can then be recognized by its effervescing with dilute acids. I have never detected it in any sample of milk examined. Its presence would also be shown in a milk analysis, by the unusual amount of ash.

3. *Flour, starch, emulsions of almonds, or hemp-seed, etc.*, are said to be used to thicken milk, and neutralize the blue colour caused by dilution. They were not found in any of our samples.

4. *Sugar, gum, dextrin*, and *borax*, to increase specific gravity.

5. *Turmeric and annatto*, to hide the blue colour.

6. *Cerebral matter, sheep's brains*, to thicken watered milk, easily detected by the microscope, and by its depositing a peculiar white sediment on standing.

7. *Carbonate or bicarbonate of soda*, to neutralize acidity. Detected by the increase in the quantity of ash, or, better, by the effervescence of the ash with acids.

297 specimens of the milk supplied to consumers in the Metropolitan district have been submitted to chemical examination. Of these 45 were seized while undergoing the process of dilution with water, 245 were purchased from the retail dealers, and 7 were procured at one of the crowded cow-stables in Brooklyn.

First Series of Analyses.—In the latter part of February, some milkmen were detected in the act of pouring a suspicious fluid, contained in milk-cans, into their milk. They were at once arrested, and taken, with their cans, about 50 in number, to police headquarters. Samples from 45 of the cans, which were placed in my hands for examination, gave the following results:—

2 cans contained water, not any too pure.

2 cans contained water, clouded with a little milk, probably from having been pumped into cans which had contained milk.

4 cans contained water, to which considerable milk had been added, the specific gravity varying from 1·010 to 1·017, representing by the galactometer from 37 to 60 per cent. of milk.

19 cans contained milk, to which considerable water had been added, the specific gravity varying from 1·023 to 1·028, representing from 80 to 97 per cent. of milk.

18 cans contained pure milk, varying in specific gravity from 1·029 to 1·030.

None of the samples contained any adulterant save water. The large proportion of pure milk is accounted for by the fact, that the work of dilution was interrupted by the police.

Second Series of Analyses.—During the months of June and July a systematic examination of milk was organized, the samples being purchased from retail dealers in various portions of the Metropolitan District. 210 samples were analysed, with the following general results:—

1. The specific gravity varies from 1·010 to 1·032, averaging 1·0208.

2. The percentage of pure milk, as shown by the galactometer, ranges from 37 to 110, averaging 72½.

3. The percentage of water varies from 83·57 to 94·17, averaging 89·89.

4. The percentage of solid constituents, the nutritive portion of the milk, varies from 5·83 to 16·43 per cent., averaging 10·11.

5. No adulteration was found in a single instance, save water.

Third Series of Analyses.—During the last four months of the year, a series of more elaborate analyses was undertaken, with a view to determine the percentages of some of the individual constituents of the milk. 35 samples were examined, and the results, which are herewith presented in tabular form, establish the fact that—

1. The cream averaged 7·89 per cent., ranging from 5·20 to 11·80 per cent.

2. The percentage of pure milk, as shown by the galactometer, averaged 82·44, varying from 50 to 112.

3. The butter averaged 3·03 per cent., varying from 1·81 to 3·76.

4. The casein and milk-sugar together averaged 6·46 per cent., ranging from 4·16 to 9·02.

5. The saline and earthy constituents averaged 0·59 per cent., varying from 0·39 to 0·87 per cent.

6. The total solids averaged 10·08 per cent., ranging from 6·73 to 12·32 per cent.

7. The water averaged 89·92 per cent., ranging from 87·68 to 93·27 per cent.

8. No adulteration was found in any case, save water.

Fourth Series of Analyses.—During the month of April, the attention of the Board having been called to the crowded condition of some of the large cow-stables in the Metropolitan District, the Sanitary Superintendent, Dr. Harris, was directed to make an investigation. It was found, on examination, that, although the stables were over-crowded, dark, and damp, and deficient in ventilation, the animals generally presented a good appearance.

The milk of these cows was specially deficient in butter, and in *every* respect poorer than the milk of healthy cows. No other indications of disease could be detected in the milk.

Fatal Accident with Petroleum Spirit.—Shortly after 10 o'clock on Thursday night, Mr. David Taylor, a chemist and druggist at Bradford, was engaged in emptying a thirty-six gallon cask of benzoline into smaller vessels, when a cat, which had been jumping about, knocked over the candle by the light of which he performed the operation. Alarmed and confused by the circumstance, Mr. Taylor dropped from his hand a half-gallon measure filled with benzoline, which, becoming ignited, instantly set fire to the house. A wooden staircase, beneath which the fire arose, was immediately in a blaze, as were also soon after the rooms above. Efforts at suppression were made by the inmates, but in vain. Two local fire brigades went to the spot, and extinguished the fire in about an hour. Soon after they arrived, a police officer, with difficulty and at great peril, rescued from bed in an upper room a child of one year and nine months, but it was found to be dead, either from suffocation or burning. Mr. Taylor estimates his pecuniary loss at £1200 or £1400.—*Pall Mall Gazette.*

Reviews.

Le Livre des Parfums. Par Eugène Rimmel; Préface d'Alph. Karr. Illustrations d'A. de Neuville, Duhousset, Chéret, etc. Paris: E. Dentu; London: Chapman and Hall.

To the lovers of perfumes this elegant volume will be a source of considerable interest and entertainment. Unlike most works on the subject, it does not consist of a mere dry collection of recipes: it is a history of the use of perfumes in all ages, and among various nations. Commencing with the Egyptians, the Jews and other Asiatic people, he describes the customs prevailing among them in regard to perfumes, passing then to the ancient Greeks, Romans, and Orientals, the savages of Africa, America, Australia, etc., the ancient Gauls and Germanic tribes, then, lastly, describing the development of the perfumer's art in more modern times. The remaining chapters are devoted to modern perfumery, and to an account of the materials used by the perfumer, in which there is an excellent statement of their nature, sources and modes of preparation. To give some idea of the immense extent of the trade in perfumes, we quote the following table, showing the quantities exported from France and the rate of increase during the present century.

Year.	Quantity, Kilogr.	Value, Francs.
1827	751,000	5,401,100
1837	886,000	6,401,600
1847	1,275,600	8,928,900
1857	2,706,700	13,533,100
1867	2,626,600	15,759,600

The volume is beautifully illustrated, with a large number of interesting woodcuts and chromotypes. It is to be hoped that the author will soon produce an English edition.

Water Analysis: a Practical Treatise on the Examination of Potable Water. By J. Alfred Wanklyn and E. T. Chapman. Second Edition. London: Trübner and Co., 60, Paternoster Row. 1870.

This is essentially an exposition of the ammonia-method analysis introduced by Wanklyn, Chapman, and Smith. The fact that it has now reached a second edition indicates that the method has been accepted by chemists. The recent and very interesting work of Dr. Angus Smith on the organic matter of the atmosphere, and Dr. Ransome's researches on the breath in health and disease, are both calculated to increase the confidence of chemists in the trustworthiness of the results given by the ammonia-method, inasmuch as both of these observers employed it in the examination of the water which had absorbed the impurities existing in the different specimens of air with which they were experimenting.

Map of the Geographical Distribution of Medicinal Substances contained in the British Pharmacopœia of 1867. By a Lecturer on Materia Medica. London: John Churchill and Sons. (One sheet mounted on cloth, in wrapper.)

It is a well-known fact that even amongst those who have had the benefit of a good education, the knowledge of geography is often very hazy, as every examiner finds when he asks a candidate to point out a certain place on a map,—answers such as America, Asia, East Indies, not being considered by some students too wide of the mark, a few degrees of latitude or longitude being to them of little consequence.

The idea of getting up cheap maps with the geographical distribution of drugs marked on them is a good one, and meets with favour from students, but there is one great drawback to the map before us, that is in the case of substances having two or more geographical sources, only indicating one on the map. Thus, if a student looks at Siam, he will find no mention of benzoin being produced there, but under Sumatra it is mentioned with the note "(*and Siam*)." Ammoniacum he will not find in the Punjaub, but in Persia it is entered for both countries.

Though this map is not so full or so instructive as Mr. Barber's Medico-Botanical Map, yet it will prove useful to students who do not require a knowledge of drugs beyond those contained in the Pharmacopœia.

Obituary.

ALBRECHT VON GRAEFE.

By the death of Albrecht von Graefe, medicine sustains one of the heaviest among her numerous losses this year. He was born at Berlin in 1825, the son of an eminent surgeon, who was himself an oculist of merit. On the conclusion of an unusually brilliant academic career, he accompanied Professor Donders, the great ophthalmic physician of Holland, on a visit to England in 1851, and having derived what benefit he could from observation of British practice, he returned to Berlin, where he shortly afterwards opened the Ophthalmic Hospital, now celebrated all the world over. In 1853 he founded, along with Arlt and Donders, the 'Archiv für Ophthalmologie,' and continued till his death the most frequent and most valuable contributor to its pages. But a few years elapsed when he gave to the world his great discovery that glaucoma, or disorganization of the eyeball, could be arrested by iridectomy. "There can hardly be," says the 'Lancet,' "either in Europe or America, a community of 10,000 people which does not contain at least one individual who is in the enjoyment of vision that has been preserved by iridectomy, and who, if Von Graefe had not lived, would now be unable to see the sun." To ophthalmic medicine this was but the most remarkable of his many contributions, which, originally announced in his own 'Archiv' and other medical journals, won their way into all scientific centres in Europe and America by the attractiveness of a style unexcelled for lucidity and force. Von Graefe owed much of his success as a practitioner to a combined suavity and firmness of manner, which made him at once the physician and the friend of his patients. Probably no special practitioner of his time ever won more gratitude from a wider *clientèle;* certainly none with the exception of Simpson (whose discovery of chloroform made iridectomy possible) has been followed with profounder regret to so untimely a grave.

July 27, after an illness of three months, Mr. Henry Sharp, of Christchurch, Hants, aged 45. He was one of the founders of the Pharmaceutical Society, and Local Secretary for the district.

Hybridization of Cinchonæ.—At the March meeting of the Linnean Society an interesting paper, by Mr. Broughton, chemist to the Madras Government, was communicated by Mr. Howard. Mr. Broughton stated that in the Madras gardens young plants were growing which appeared to be hybrids been *C. succirubra* and *C. officinalis*. In Java also something similar has occurred between *C. Calisaya* and *C. Pahudiana* (= *C. Hasskarliana*, nov. sp. Miq.). In a letter, Dr. de Vrij says:—"The *Calisaya* of Java contains, besides quinine and cinchonine, very often quinidine. The *C. Pahudiana* contains, besides quinine and cinchonine, almost always cinchonidine. In the hybrid of these two I found no quinidine, but cinchonidine and quinine. As the total amount of alkaloids was small, I was unable to ascertain the presence of cinchonine." (The Hague, 1870.) This discovery will doubtless prove of great importance, for by this means the more delicate, but valuable, alkaloid species can be crossed with those that are more hardy but less valuable, and thus valuable and hardy plants will be obtained.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

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

"Rule of Thumb."

Sir,—"Anti-Humbug" has written a very harum-scarum letter upon the above subject. Now, accuracy cannot be humbug. If a pharmacist has certain ingredients ordered to be divided into twelve equal parts, it is his sole duty to *know* that each part is an equal division, independent of inertness or activity of the medicine. He cannot know if he trusts to a fallible organ, like the eye. Really there is such a thing to be observed in dispensing medicines as conscientiousness, and it is also a fact, that the Pharmacopœia recognizes "dose." Rifle-shooting and carpentering are scarcely such delicate matters as the correct administration of a dose of calomel.

Yours, etc.,

Minor Associate.

July 30, 1870.

Sir,—I confess I was somewhat surprised to find, upon looking down the correspondence column of the last issue of the 'Pharmaceutical Journal,' that there was any gentleman who could so unmistakably advocate such a dangerous method as "measurement" by "rule of thumb." Apart from considering the arguments of your correspondent in support of his views, I cannot help thinking that there is a principle involved in the question upon which it is very desirable we should have a clear understanding.

In these times of examination, when so important a part of our curriculum is devoted to determining the student's capacity for *correctly* ascertaining the amount of active ingredient contained in each dose of medicine prescribed; I think that, to allow the exhibition of such a *principle* as that contained in your correspondent's letter to pass unchallenged, is to commit an error, the gravity of which cannot be too fully estimated.

It may possibly be in the power of "Anti-Humbug" in dispensing *accurately* to measure his medicines by "rule of thumb," but is it correct that such a method should be openly recommended; for I cannot see that he lays down any rule by which we are to decide upon the fitness, or otherwise, of our young members to practise this acquirement?

Of the *danger* of allowing young and *unpractised* dispensers to proceed by "rule of thumb," it is, I trust, needless to speak? Is it, therefore, *dangerous* to allow opinions such as these to pass current in our official organ; for it is apparent they may have a doubtful, if not a decidedly injurious effect upon the minds of those who, by reason of their inexperience, are so prone to imbibe erroneous ideas?

Hoping that this may not be considered an unwarrantable encroachment upon your valuable space,

I remain, yours truly,

E. R. L.

Bath, August 1, 1870.

Trade Grievances.

Sir,—May I beg your indulgence for a small space in your Journal, for a few remarks on what are popularly called *trade grievances?* In almost every number of your Journal is a mass of correspondence, chiefly bewailing our unfortunate lot, and suggesting numerous and various remedies; but as yet I am not aware they have been followed by any practical benefit, and, in my humble opinion, if the following suggestions had not, by a strange oversight, been forgotten in framing our new Act, we should have very rapidly advanced from our present position of tradesmen to our true status of professional men; our pecuniary affairs, of course, advancing in the same ratio.

The first *grievance* is one that has been well ventilated in your columns, namely, Counter Prescribing *versus* The Dispensing of Medicines by Surgeons. I would stringently restrain druggists from supplying all but the most simple medicines, except on the written authority of a medical man, and, on the other hand, would insist on that anomalous animal—a general practitioner, being forbidden, under heavy penalties, from dispensing his own medicines. I advocate the abolition of counter prescribing, although, myself, I do a large practice in it, because I consider it to be the root of all dissensions between ourselves and the medical fraternity. England proudly considering herself the first in the march of civilization and science, is, after considerable advances, still wofully behind her Continental neighbours in the matter of medical and Pharmaceutical reform. Why have we need of so many classes of medical men? From experience in five Continental countries I cannot see the necessity. If a "doctor" to prescribe, and a "pharmacien" to dispense, are all that are required in France, Italy, Switzerland, Germany, Belgium, why must we be saddled with apothecaries, surgeons, etc.,—mongrel compounds of druggists and physicians? Perhaps this clause was not inserted, because the Council did not think it politic to grasp too much at commencement, and it is standing over to a more favourable period,—at least I sincerely hope so.

The other *grievance* is the sad inroad made into our business and reputation by the piratical crew of small shopkeepers, herbalists, quacks, anti-vaccinators, Coffinites, etc., who infest us as maggots do cheese, especially in large manufacturing towns, where in any but the principal thoroughfares every tenth house will sell castor oil, sweet nitre, herbs, pills, powders, *et hoc genus omne,* and who thus take away a great part of our legitimate business, and get us into such disrepute with coroners' juries. The remedy for this is very simple, and I was astounded when the new Act came into operation, without a word on this head. I would merely add bodily to our Act the 6th Article of the French Code, which I translate verbatim, for the benefit of such of your readers as may not have seen it.

"Art. VI. It is forbidden for all grocers, and *all other persons,* to make, sell, or keep in stock any salts, composition, or preparations, entering into the human body in the form of medicines, or to make any mixture of simple drugs, for administering in form of medicine, under a penalty of £20, or more if requisite." This clause is beautifully clear and decisive, and if fortunately it had been incorporated in our own Act, we should have been relieved from these parasites, who at present, if they only steer clear of poison, may sell (or rather undersell) their cheap, adulterated drugs, under the very nose of a Pharmaceutical Chemist, who has had heavy demands on his time and money, in order to qualify him to open a shop.

These then, are, in my opinion, the only stumbling-blocks on the road to advancement, and if the Council will only give them the consideration they duly deserve, we may, at some future time, relieve ourselves of the trammels of paints, oils, and colours, and rise to something higher than "the druggist round the corner."

Although very dissimilar to the above, yet intimately connected with it, is your leader in last number of the Journal, in which the writer takes it for granted that the new members have been elected from the provinces merely in opposition to London members, without due regard to merit, or long and valued services. This is not so; a London chemist has not the slightest idea what a country drug business is like, or what are the requirements of a country druggist. The former Council, in effect, chiefly composed of Londoners, would insist on looking at us from a distance through the rose-coloured glasses of money-coining West-End establishments, and, wishing to elevate us too rapidly on a level with themselves, have done us considerable injury, chiefly by neglecting any attempt to rectify the above grievances; this neglect, we are glad to admit, has not been from unwillingness to assist us, but merely from insufficient knowledge on the subject, and as we provincials form the great body of the Society, pressure was brought to bear on country members to ensure the new Council having the proper proportion of provincial representatives it was entitled to.

Apologizing for trespassing so much on your valuable space,

I remain, yours faithfully,

A Country M. P. S.

Pharmacist, or Pharmaceutical Chemist?

Sir,—On the eve of another Pharmaceutical Conference, allow me, through the medium of the Journal, to draw the attention of Pharmaceutical Chemists to the desirability of adopting (as a body) the title of "Pharmacist" or "Pharmaceutist" in preference to that of "Pharmaceutical Chemist."

We very seldom find the title of Pharmaceutical Chemist used by the public, either in verbal or written communications; probably the reason of this is due to its length, the word "chemist" being much more easily written without than with "Pharmaceutical" tacked to it. I think this would be obviated by the adoption of either of the words suggested.

Trusting the subject will be taken up by those capable of bringing it, if thought desirable, to a successful issue,

I remain, yours truly,

W. Milner Thompson.

Navy Dispensers.

Sir,—I cannot agree with your correspondent of the 23rd inst., "J. T. D.," respecting the remuneration to Navy dispensers; he thinks they will be underpaid, and states that a qualified assistant can earn 5*s.* a day, or more.

In order to form a fair comparison we must remember that the Navy dispenser will not require any capital, and in this respect he is on a par with an assistant in civil service life, but not with the man who starts or purchases a business.

Now, Sir, I have been an assistant about eleven years, and am receiving £40 per annum, with board and lodging. Supposing I had been a Navy dispenser for the same period, my pay would be £2. 5*s.* 6*d.* per week, and quarters; deducting 12*s.* per week for rations (which is ample in the service), my pay would be, free of all drawbacks, £1. 13*s.* 6*d.* per week, more by 18*s.* per week than I now receive.

Yours obediently,

An Assistant.

P.S. I have not touched upon the very important item of superannuation.

Free Trade in Surgical Instruments.

Sir,—Having read the article in question, which appeared in a medical contemporary, and also your remarks thereon, I cannot refrain from expressing my astonishment and regret at the extraordinary strong language, of which you justly complain. Surely, such ugly insinuations as the following, "If the public can be combined against the profession, cannot we can retaliate?" and again, "we can very easily endanger their regular trade," cannot embody the spontaneous sentiments and charitable expressions of the honourable profession whom your contemporary assumes to represent. If a few members of the Nottingham Association have ventured to give utterance to their own private feelings, that is no reason why he should fire such explosive missiles indiscriminately at the "enlightened and respectable pharmaceutists" of whom he speaks, and who, if he forgets not, are in possession of vested rights, privileges, and honourable pursuits far more profitable than the "grasping conduct" he alludes to. The days for such a menacing attitude and vain-boasting having gone by, and the overture of a more glorious era having already commenced, I sincerely trust that the magnifying and deceptive spectacles wherein he beheld a Nottingham gnat assume the proportions of a prodigious camel will never be taken up again, and that language so offensive and uncalled for will be avoided in future.

T. C. Jones.

Chalk Farm Road, N.W., August 1, 1870.

Case of Explosion.

Sir,—Some time since, I had occasion to prepare a strong solution of iodine and iodide of potassium, and, having filtered the solution, left the filter paper in the funnel, where it remained until the following morning, by which time it was quite dry; to my great surprise when I took hold of the filter to throw it away, an exceedingly loud report occurred, shattering the paper and funnel to fragments; the wall of the room was marked in various places by the iodine, my face also being covered with iodine stains for weeks. I am quite at a loss to account for the explosion, perhaps some of your readers may be able to throw light upon the subject.

July 27, 1870. F. J. Trauten.

Poison Regulations.

Sir,—The keeping and dispensing of poisons is a subject which can, in my opinion, only be disposed of when some definite plan is accepted by pharmaceutists, and this will require to be easy of application, inexpensive, and effectual. Now, the two first methods recommended by the Council are objectionable, inasmuch as they involve expensive alterations, either by the adoption of distinctive bottles, "angular, fluted, or corrugated," or of a large "poison cupboard," or rather small room to keep poisonous drugs apart from others.

The first of these plans would require either a very considerable number of new and expensive bottles which, in thousands of cases, could be ill afforded; or an amount of room which could be as ill spared, if it could be found at all.

One other proposal remains, viz. "that bottles or vessels used in any shop or dispensary to contain poison, shall be tied over, capped, or secured, in a manner distinguishable from the way in which any bottles or vessels not used to contain poisonous or dangerous articles used in the same shop or dispensary," etc.

To carry this into effect, I can offer a simple, efficient, and inexpensive plan which I have used in my own pharmacy, and with most satisfactory results for several years. It consists in the use of a neatly constructed india-rubber capsule, which goes most readily over the stopper and shoulder of the bottle, fixing itself by its elasticity alone. It can be put on or off instantaneously, and it bears the word Poison prominently on the side. These are the capsules of which Mr. Sandford spoke at the Annual Meeting, but at the time he had not seen them.

A bottle containing *laudanum, tincture of aconite,* or any other dangerous drug, protected by one of these capsules *could* not without *incredible* carelessness be taken down in mistake for a different bottle not requiring protection. Their general adoption by Pharmaceutical Chemists and the chemists and druggists of Great Britain would, I believe, fully meet all the requirements of the Pharmacy Act, and render unnecessary the interference of Government or Parliament, so as to affect the free action of members of the Pharmaceutical Society, which will certainly be endangered if this or some other plan be not voluntarily adopted.

I enclose you two of the capsules which, if fitted on the proper-sized bottles, will enable you to form a judgment on them.

Your obedient servant,

H. C. Baildon.

73, *Princes Street, Edinburgh, August* 2, 1870.

Note.—Subordinate to the safe keeping of poisons, but still one of some importance to pharmaceutists, evaporation is prevented by the use of these capsules in the case of spirituous preparations. I need hardly say how great the loss is from this cause, or that the greater number of liquid poisons *are* spirituous preparations.

"*Navy Dispenser*" (Rochester) should apply to the Admiralty Office.

"*Zeta*" (Liverpool).—Inquiry shall be made.

"*Rees Lloyd*" (Dowlais).—In the press.

"*Physicians' English.*"—Mr. D. Carroll (Framlingham) writes, in reference to the letter of "Echo," in the Journal of July 16th, pointing out that physicians are also liable to the commission of errors in the use of English and Latin.

E. Trinder (Solihull).—Received with thanks.

"*Leno*" (Sheffield) wishes to have a formula for Quinine Balm for the Hair.

M. E. L. (Southport).—Apply at Apothecaries' Hall.

"*A Member*" (Stroud).—Apply to the Secretary.

C. B. A.—Assistants to Chemists and Druggists need not be on the Register of Chemists and Druggists.

"*Flora of Hampshire.*"—In answer to Mr. Brook, jun., of Southville, Mr. Gibbs, of Winchester, writes: "There is no 'Flora of Hampshire' published. There is a manuscript copy of a catalogue of the flora of Hants, by Dr. Bromfield, preserved at Kew; also a 'Flora of Andover,' published by Clarke. I know of several good herbaria of localities, and should be very glad to communicate with Mr. Brook on the subject."

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

The General Index to the first Fifteen volumes of this Journal may be obtained of the Secretary, 17, Bloomsbury Square, price 2*s.* 8*d.*, post free; bound in cloth, lettered, 3*s.* 8*d.*, post free.

The General Index to the Vols. XVI.–XVIII., Old Series, and Vols. I.–IX., Second Series, may also be obtained of the Secretary, price 3*s.* 3*d.*, post free.

NOTE ON THE ALKALOIDS OF THE GENUS ACONITUM.*

BY PROFESSOR FLÜCKIGER.

Aconitine was discovered by Hesse, in 1833. Von Schroff, in 1857, showed that there occur in aconite tubers two different principles, one being possessed of narcotic properties, the other of an extreme acridity. Von Schroff did not himself isolate these principles, but he ascertained that the physiological effects of the aconitine used throughout Germany agreed with those of the narcotic principle above alluded to. On the other hand, "*Pure Aconitine*," made by Messrs. Morson and Son, was stated by Von Schroff to exactly represent the acrid principle, which his physiological experiments had pointed out, in aconite tubers. He further observed, that this acrid body prevails, or even exists exclusively, in the tubers of certain species of *Aconitum* growing in the alpine regions of the Himalayas. These highly poisonous tubers have been known and used in India since a remote period under the names of *Bikh*, *Bish*, or *Ativisha*, and are met with in the bazaars, and also occasionally imported into London. Von Schroff therefore suggested that the Indian tubers might be the source of what he called *English Aconitine*.

Thus there was established in German literature an important difference between German Aconitine and English Aconitine, the two substances being regarded as by no means identical. The name *Aconitine* then was restricted to the former, while the designation of *napelline* (Wiggers), *nepaline* (Flückiger), *acraconitine* (Ludwig), and *pseudaconitine* (Hübschmann), were severally proposed for the so-regarded *English* preparation. Hübschmann, in 1868, first examined the chemical properties of pseudaconitine, which he had obtained from E. Merck, Darmstadt. It is but sparingly soluble in ether, chloroform, and even in alcohol, but crystallizes readily, especially from hot alcohol; it is soluble in hot benzol, does not soften in boiling water, is not coloured by cold sulphuric acid, nor even after the addition of nitric acid. I have been presented by the late Hübschmann with a small specimen of this pseudaconitine, and am enabled to corroborate the above statements. It is a substance which has a burning, not a bitter taste, and does not produce any coloured reaction with concentrated sulphuric, nitric, or phosphoric acid, either cold or hot, alone or combined.

The aconitine sold in Germany has been for many years past mainly prepared by Hübschmann from tubers of *Aconitum Napellus*, grown in the Swiss Alps. An authentic sample of this alkaloid, as furnished by the manufacturer himself, exhibited the chemical characters universally attributed to aconitine. It dissolves in 2 parts of ether, 2·6 chloroform, 4·2 alcohol, but without separating in distinct crystals upon evaporation. Aconitine produces an intense violet colour with hot concentrated phosphoric acid, this characteristic reaction lasting for several days. Aconitine has an extremely bitter, scarcely somewhat acrid taste.

Consequently, there can be no doubt that aconitine and pseudaconitine are entirely different alkaloids, which may be easily recognised and separated, if occurring, for instance, in Bikh tubers. That pseudaconitine is identical with Von Schroff's "English aconitine," I cannot assert positively, although I suppose it to be so.

I was now desirous of ascertaining whether the aconitine of English chemists and manufacturers agreed or not with pseudaconitine. My friend Mr. Hanbury, as well as Mr. Thomas B. Groves, F.C.S., of Weymouth, kindly provided me with samples of commercial aconitine, to which the latter gentleman also added some specimens prepared by himself. At the outset I examined the "*pure aconitine*" of Morson, as at present sold by that manufacturer, and also samples of his product dating from the years 1856 and 1860. All of them were found to agree exactly with Hübschmann's aconitine. Nearly the same may be said with regard to aconitine made by Hopkin and Williams, which, however, produced a less pure coloration with phosphoric acid, and tasted, in aqueous solution, not quite purely bitter, but, at the same time, somewhat acrid. Its watery solution also yields a soft greasy brownish precipitate with platinocyanide of potassium, whilst in Hübschmann's and in Morson's aconitine the platinum salt produces a heavy, white, not at all agglutinating compound. This discrepancy appears to be due to the presence of a very small quantity of impurities in the alkaloid of Hopkin and Williams. I found its chlorhydrate to contain the same amount of hydrochloric acid as that of Hübschmann, and in its physiological effects no difference could be traced.

The samples of aconitine, prepared by Mr. Groves from *A. Napellus*, agreed partly with the products of Hübschmann and of Morson, partly with that of Hopkin and Williams, inasmuch as the coloration produced with hot concentrated phosphoric acid was pure, or less pure violet. The aconitine of Mr. Groves (at least in some of his samples) is remarkable, as it consists of microscopic crystals; all the other samples of this alkaloid, which I had the opportunity of examining, being entirely amorphous. The said chemist was also the first who succeeded in obtaining crystallized salts of aconitine;* I am indebted to him for really fine rhombic octahedrons of nitrate of aconitine.

It must be concluded from the foregoing experiments, that the aconitine used in England, and that found on the Continent, at least in Germany, are essentially one and the same substance.

Yet pseudaconitine exists. In 1868, the London house of Roller and Wiedenmann met there with a "*cheap aconitine*," which they sent for examination to Mr. Merck. When engaged in the present investigation, this substance had disappeared from the market, so that I could not succeed in obtaining any; but the statements of Mr. Merck † are sufficient to show it was pseudaconitine. Unfortunately no further information as to the source of this curious body was to be obtained. I am informed that in London it was said to come from the Continent! This mysterious pseudaconitine being attributed to the Bikh tubers, I prepared an alcoholic extract of the latter, which was examined by Dr. Klebs, Professor of Pathologic Anatomy in our University. It proved to agree in its effects with aconitine, but decidedly *not* with pseudaconitine. I am also informed, most positively, that in London the manufacturers of aconitine *indiscriminately* resort to Indian

* Abstract from the author's paper in the 'Archiv der Pharmacie,' cxci. (1870), 196 to 215.

* Pharm. Journ. VIII. (1866) 122.
† *Ibid.* X. (1868) 248.

or to Continental (Swiss) aconite tubers, for making aconitine. Where then does pseudaconitine occur?

Bikh tubers appear to be collected from several Himalayan species, especially from *Aconitum ferox*, Wallich, but *A. Napellus* also occurs in the Himalayas.* The specimens of Bikh I had the opportunity of examining are not, however, the tubers of the latter species, the appearance of which is extremely characteristic, the tubers being always formed in pairs, each pair united by a short branchlet. All the eastern tubers, which I have seen, are *single*, and mostly considerably larger than those of *A. Napellus*, but simpler, and devoid of rootlets. Their appearance is so uniform that I should not feel entitled to attribute them to several mother-plants. Whether there are Himalayan aconites containing *pseudaconitine* instead of *aconitine* is a question, to the solution of which I am sorry I cannot contribute.

Some other alkaloids have been pointed out by Hübschmann as existing in aconite.† In *Aconitum Napellus* he found *napelline*, differing from aconitine by its solubility in ammonia, and insolubility in ether. The rhizomes of *A. Lycoctonum*, L., the yellow-flowered Aconite, yielded *lycoctonine* and *acolyctine;* the latter, however, finally proved to agree, probably, with napelline. Again, Messrs. Smith, of Edinburgh, in 1863, obtained from tubers of Napellus, *aconelline* which substance is now thought to be none other than narcotine. No subsequent observer has met with it in aconite.‡ Now is the pseudaconitine a peculiar principle, or does it agree, as has been suggested, with any one among the alkaloids I have named? As to napelline,§ its properties, as given by its discoverer, prove at once that it is quite different from pseudaconitine. If aconelline agrees with narcotine, the well-known characters of this latter substance do not allow us to suppose it in any degree similar to, still less identical with pseudaconitine. Lastly, *lycoctonine* having never been carefully examined, I felt obliged to do so, all the more as the late Hübschmann had himself furnished me with it in a state of perfect purity.

Lycoctonine consists of white, needle-shaped crystals, not melting (like aconitine) in boiling water, but only at some degrees above. On cooling, it does not resume its crystalline form until it is moistened with water, when the amorphous mass is quickly transformed into tufted crystals. By melting, lycoctonine loses no water, nor does it combine with water by the act of re-crystallization. Lycoctonine readily dissolves in chloroform, which, after evaporation, leaves behind an amorphous varnish, which again, on moistening with water, becomes very strikingly crystalline. Sulphide of carbon, ether, alcohol, the fat and volatile oils, amylic alcohol, petroleum spirit, largely dissolve lycoctonine. Of boiling water, 600 parts dissolve 1 part of lycoctonine. The solution has an alkaline reaction and bitter taste; it produces fine yellow crystals if bromine water is added. This takes place even if the solution contains but 1 part of lycoctonine in 30,000 water. Lycoctonine is also precipitated by iodohydrargyrate of potassium, the compound crystallizing after some hours. One part of lycoctonine in 20,000 water yields these crystals after twelve hours. The analogous mercuric compound of aconitine always remains uncrystallized. As to physiological effects, lycoctonine is far less poisonous than aconitine.

Lycoctonine is, therefore, a well-defined, peculiar alkaloid, differing from aconitine as well as from pseudaconitine. I hope soon to determine its composition.

The results of the researches here detailed may be summed up as follows:—

1. Aconitine is contained in the blue-flowering European and Himalayan species of *Aconitum*, especially in *A. Napellus*.
2. Aconitine is particularly characterized by the following properties:—It is anhydrous, becomes soft in boiling water, although it only melts near 120° C. The aqueous solution has a bitter taste, free from acridity; it is not precipitated by bichloride of platinum, but produces an uncrystallizable precipitate with iodohydrargyrate of potassium. It dissolves very readily in ether, chloroform, and alcohol, and forms a monochlorhydrate, $C_{30}H_{47}NO_7+HCl$. The nitrate can be obtained in well-developed microscopic crystals. Aconitine imparts a violet colour to hot phosphoric acid which has been concentrated as much as possible in the water-bath.
3. All aconitine from England which I examined agrees essentially with the German (or Swiss) aconitine.
4. There exists, however, a base entirely distinct from aconitine, of uncertain origin, but perhaps derived from the aconite tubers (*bikh*) of Nepal and other alpine regions of India. It may be distinguished as *pseudaconitine*.
5. Pseudaconitine has a burning, not a bitter taste. It is insoluble in water, less soluble in ether, chloroform, and alcohol, but freely crystallizable from these solutions. It is not coloured by hot concentrated phosphoric acid.
6. Napelline differs both from aconitine and pseudaconitine.
7. So also does lycoctonine, an alkaloid peculiar (so far as we know) to the yellow-flowered Aconite (*Aconitum Lycoctonum*, L.). Its bromine compound crystallizes from a dilute aqueous solution, but upon drying is decomposed.

* Hooker and Thomson, 'Flora Indica,' i. (1855) 3, 54.

† For further particulars, see my original paper in the 'Archiv der Pharmacie.'

‡ Pharm. Journ. VIII. (1866) 123.

§ The existence of napelline has been doubted by some authors, but has been always decidedly maintained by Hübschmann.

ACETIC FERMENTATION.

BY BARON VON LIEBIG.

In the investigation of physiological or other phenomena where there are both chemical and physiological processes concerned, as in the case of fermentation, the true method of research requires that the chemical and physical laws of both should be ascertained; indeed the utmost we can expect is to arrive at a knowledge of these laws. The explanation of a physiological phenomenon consists, therefore, in ascertaining first what physical or chemical laws it is subject to, and it is the object of further investigation to determine the extent to which they are concerned.

From this point of view I have endeavoured to refer the chemical process of fermentation to a chemico-physical cause, by directing attention to the influence exercised by a substance in a state of molecular motion upon another highly complex substance whose particles are held together feebly and are in a state of tension. If the molecular motion in the one substance be the consequence of disturbed equilibrium, some exercise of work may be ascribed to it, and this would become sensible in the dislocation or severance of the elements of the other substance.

This view has not been generally accepted, and, quite recently, another one has been adopted by which the transformation of organic materials into inorganic compounds is ascribed to the nutrition and growth of inferior organisms. Thus the old idea of vital force, belonging to the last century, has again become current under a new form in the explanation of very simple chemical changes.

"Fermentation," said Mitscherlich,* "is caused by a plant organism, and putrefaction by an animal organism." Then twenty-six years afterwards, Pasteur has described certain species of fungi, some of which produce acetic fermentation, others lactic fermentation or mucous fermentation, while the butyric and tartaric fermentation, that resemble putrefaction, are assumed to be caused by vibrios.

The characters of these animated ferments are very peculiar.

The acetic acid fungus is, according to Pasteur, so much like the lactic acid fungus, that the two are frequently undistinguishable by the microscope. Moreover, the lactic acid fungus is said to resemble beer-yeast.† The action of these ferments is also very varied.

According to Pasteur, acetic acid is the product of *Mycoderma aceti;* but this plant also produces succinic acid,‡ and, in contact with sugar, it gives rise to vinous fermentation.§ According to Pasteur, phosphates and alkalies are necessary constituents of this fungus, while Mulder declares that when burnt it does not leave the least trace of ash.||

The behaviour of the lactic acid fungus is still more remarkable, for its activity is not limited to the production of lactic acid only, and it is capable of producing butyric acid, mannite, mucus and even alcohol.**

If sugar be fermented with beer-yeast, and the fermented liquor be exposed to the air, a layer of mould is formed on the surface, while the alcohol is converted into acetic acid. A portion of that mould, placed in contact with sugar and chalk, causes the conversion of the sugar into lactic acid.

The lactic acid ferment also produces butyric acid under certain circumstances, though the proper butyric ferment is infusorial; it converts sugar, gum and lactic acid into butyric acid. Atmospheric air is detrimental to it, and it is killed by access of air. However, Maddrell and Engelhard found that lactate of lime, although recrystallized twice and therefore containing only a trace of lactic ferment, was remarkably susceptible of butyric fermentation; while in an experiment made specially to determine the point they observed, in opposition to Pasteur's statement, that the butyric fermentation was accelerated by access of air.††

* Ann. Chem. Pharm. xlviii. 126.
† 'Comptes Rendus,' xlv. 903.
‡ Bull. de la Soc. Chim. 1862, p. 52.
§ Thomson, Ann. Chem. Pharm. lxxxiii. 90.
|| Ann. Chem. Pharm. xlvi. 24.
** 'Comptes Rendus,' xlv. 913.
†† Ann. Chem. Pharm. lxiii. 86.

According to Pasteur the butyric ferment can be sown like beer-yeast. He states that in suitable media, such as solutions of sugar, ammonia, and phosphates, it increases, and that butyric acid is formed meanwhile. But if the facts are the same as in the case of beer-yeast, there does not appear much hope of any particular result. The observations of these living ferments are obviously very superficial and contradictory, so that it is barely possible to say that during the last twelve years there has been any advance towards more definite ideas as to their nature and mode of action.

In reference to the part taken by living organisms in putrefaction, Van den Broeck* expresses himself very clearly as follows:—"The microscopic examination of the five animal substances (egg-white, egg-yelk, arterial blood, gall and urine of the dog and oxen) has taught me that there is no connection between their putrefaction and the development or growth of vibrios."

From the moment a piece of muscle is separated from the living body it begins to undergo alteration; after some hours it acquires an acid reaction, the coagulable substances are coagulated, the contents of the muscular tubes become more solid and acquire a clouded appearance with a thickish consistence. The muscle contracts and thickens, or *rigor mortis* takes place; then, after some time, the stiffness ceases, the acidity augments, and offensive-smelling products make their appearance.

If organized ferments have nothing to do with the formation of the first products that appear in the muscles up to the occurrence of *rigor mortis,*—and I believe there is no physiologist who thinks they have,—then it is difficult to understand how the further alterations can be determined by them.

Fungi and vibrios are dependent upon organic material for their development and nutrition, and the cases where they are not met with in putrefying or decaying materials under ordinary conditions are seldom enough. Accordingly, as one observer finds them or not, opinion may shift from one side to the other, but it would be hopeless to expect from microscopic observations an elucidation of the part they play.

If acetic fermentation be understood as the production of acetic acid from alcohol, it is from a chemical point of view the most thoroughly investigated and most accurately known of all kinds of fermentation.

Pasteur has maintained that the production of acetic acid is a process of fermentation, and that it is determined by the *Mycoderma aceti.*

In the cultivation of *Mycoderma aceti* upon alcoholic liquids, the alcohol is converted first into aldehyde, and then into acetic acid. The vinegar-plant acts only when in direct contact with the air, not when it is immersed; it also requires as food phosphates and albuminous substances.†

I have hitherto believed that the production of acetic acid was well understood, and that it consisted simply in the oxidation of alcohol. Finely divided platinum converts alcohol into acetic acid by means of the oxygen condensed upon it. A number of organic substances are known to absorb oxygen from the air and to retain for some time the power of oxidizing other substances, as in the case of platinum.

* Ann. Chem. Pharm. cxv. 79.
† 'Comptes Rendus,' lviii. 142.

Oil of turpentine, ether, aldehyde, or bitter almond oil, that have been shaken with air, will convert sulphurous acid into sulphuric, and decolorize tincture of indigo; even sulphurous acid, and many solid organic substances, will, while undergoing oxidation, determine the oxidation of other substances, organic and inorganic.

This remarkable property was noticed more than thirty years ago by De Saussure* as being possessed by putrefying substances; and it is worth while to recall to mind his experiments. "When vegetable mould, or the humus contained in various soils, or moist seeds that have undergone fermentation, are kept under a bell jar filled with oxygen, this gas is gradually converted into carbonic acid." Though this is not very remarkable, the following fact is very much so:—"If hydrogen gas be mixed with the oxygen it is converted into water. As the hydrogen disappears, half of its volume of oxygen disappears also."

"When carburetted hydrogen, carbonic oxide, or the hydrogen obtained by the action of red-hot iron on water, are, in this experiment, substituted for hydrogen obtained by dissolving zinc with acids, they do not undergo oxidation." Saussure adds, "These decaying substances act upon the mixture of oxygen with hydrogen in the same way as platinum, and those gases which prevent the action of platinum also prevent the combination in this case."

It seems to me nothing can be more evident than that the oxidation of hydrogen in contact with decaying materials and oxygen is a purely chemical process that has been further elucidated by the experiments of Schönbein and by the formation of ozonized oxygen.

The oxidation of ammonia to nitric acid in the presence of alkaline bases and in soils containing much humus is also due to the same circumstance.

Evidently, decaying substances are capable of condensing oxygen from the air and bringing it into such a condition that it can combine with other substances which do not combine with oxygen at low temperatures, except when aided by these absorbents of oxygen.

Let us suppose that, in place of the hydrogen in Saussure's experiment, alcohol vapour were brought in contact with decaying wood or some material acting in like manner, and then we shall have an explanation of the production of acetic acid from alcohol. In consequence of the oxidation of its hydrogen, alcohol is first converted into aldehyde, and this by further oxidation passes into acetic acid. It is known that the theory of acetification was first suggested by Döbereiner in his memoir on "the behaviour of platinum sponge towards air and alcohol vapour;" and that the method introduced by Schützenbach in 1823 for the manufacture of vinegar is based on this theory.

In this operation wood-shavings or fragments of charcoal are used for determining the oxidation. At one of the largest vinegar factories in Germany, the dilute alcohol receives no admixture during the whole operation; besides air and wood-shavings or charcoal, there is no other material concerned, and the fresh supply of dilute alcohol is only mixed with a little of the unfinished vinegar from a previous operation. The proprietor of these works, Hr. Riemerschmied, sent me some of the beech-wood shavings which had been used uninterruptedly for twenty-five years; and in reply to my inquiry as to whether the *Mycoderma aceti* took part in the production of vinegar, he states that, so far as can be seen, the shavings that have been thirty years in use are quite free from that fungus. According to his data, a hectolitre of wine containing 9 per cent. of alcohol, is converted into vinegar within three days.

If the fermentation of acetic acid were determined by the growth and development of the vinegar-plant, it might be expected that this fungus would increase in some proportion to the acetic acid formed when alcohol was used, as well as when fermented liquors were used. This really takes place when wine is used, and especially with fermented beer-wort, which contains nitrogenous material and phosphates that serve as food for the *Mycoderma aceti*. The production of the fungus is a continual source of hindrance in factories where beer-wort is used, since the interstices of the wood-shavings are gradually stopped up by its growth, and thus free circulation of air is prevented so far as to stop the formation of vinegar.

However, the dilute alcohol used in vinegar works does not contain food for the vinegar-plant, and yet acetic acid is produced without its aid. If the spirit contains amylic alcohol, valerianic acid also is formed.

Microscopic examination of the wood-shavings sent me by Hr. Riemerschmied did not show the presence of *Mycoderma aceti*. They had merely the brown colour of decayed wood, and the structure was quite unaltered.

It is entirely beyond doubt that the vinegar-plant is capable of causing the conversion of alcohol into acetic acid, but this effect is not the result of a physiological process. For the conversion of alcohol into acetic acid oxygen only is necessary, and that the *Mycoderma aceti* does not and cannot furnish. Analyses of the air discharged from the vessels where the vinegar is made, show that the oxygen consumed in the oxidation of alcohol is taken from the air, and the only part taken by the vinegar-plant in the process is that of determining the absorption of oxygen; it is active only in virtue of this chemical property, and it can be replaced by a large number of dead materials or parts of plants.*

These well-known facts prove that the production of acetic acid from alcohol is not brought about by a physiological process; acetic acid is not a product of the *Mycoderma aceti*, but a product of oxidation.

(*To be continued.*)

* Bibl. Univ. de Genève, Feb. 1834.

* The comparatively large amount of nitrogenous material remaining after the fermentation of beer-wort or wine-must, containing little sugar, is a main cause of the beer or wine turning sour, for that nitrogenous material has a great tendency to attract oxygen. In German breweries gypsum is added to the boiling wort with the object of reducing the amount of nitrogenous material, and fermentation is carried on at a low temperature to avoid formation of acetic acid.

In the manufacture of spirit from potatoes and maize, sulphurous acid has been found very useful for augmenting the yield of alcohol by preventing formation of acetic acid. The maize is mashed with water containing some sulphurous acid. In Austria and Hungary this procedure has been dealt with as a mystery, and manufacturers have paid large sums for being taught it. I have ascertained, by special experiments, that a moderate amount of sulphurous acid has scarcely any influence on the fermentation of beer-wort or of sugar with yeast.

WATER CHESTNUTS.

BY M. C. COOKE.

The name of "water chestnuts" has been applied to the fruits of several species of *Trapa*, aquatic plants belonging to the Natural Order Haloragaceæ, of which the European species, *Trapa natans*, the "Marron d'Eau" of the French, is said to have furnished part of the food of the ancient Thracians. The three principal Oriental species, if all are really distinct, are—

Trapa bicornis, L.—Nuts with two opposite, recurved, very obtuse horns. The *Lin-ko* of the Chinese. A native of China, where it is carefully cultivated in lakes, ponds, and other receptacles of water.

Trapa bispinosa, Roxb. (fig. 1).—Nuts with two opposite, straight, barbed, spinous horns. The *Singhara* of India. Cultivated in Bengal and other parts of India as high as Kashmir.

Fig. 1. *Trapa bispinosa*, Roxb.

Trapa quadrispinosa, Roxb.—Nuts with two opposite pairs of straight, acute, spinous horns. A native of Sylhet, where it is found floating on lakes and pools of fresh water.

All these species are esculent, consisting chiefly of starch, but it is to the Singhara nut, *Trapa bispinosa*, that most of our observations will apply.

We learn from Colonel Sleeman that the water chestnut is everywhere as regularly planted and cultivated in fields, under a large surface of water, as wheat and barley are on the dry plains. It is cultivated by a class of men called Dheemurs, who are everywhere fishermen and palanquin-bearers, and they keep boats for the planting, weeding, and gathering the Singhara. The holdings or tenements of each cultivator are marked out carefully on the surface of the water by long bamboos stuck up in it, and they pay so much the acre for the portion they till. The long straws of the plants reach up to the surface of the water, upon which float their green leaves, and their pure white flowers expand beautifully among them in the latter part of the afternoon. The nut grows under the water after the flowers decay, and is of a triangular shape, and covered with a tough brown integument.

The people are very fond of these nuts, which are often carried upon bullocks' backs two or three hundred miles to market. They ripen in the latter end of the rains, or in September, and are eatable till the end of November. The rent paid for an ordinary tank by the cultivator is about 100 rupees a year. Sometimes 200 rupees is paid for a very large one, and even 300, or £30 a year. But the mud increases so rapidly from this cultivation that it soon destroys all reservoirs in which it is permitted, and where it is thought desirable to keep up the tank for the sake of the water, it should be carefully prohibited.

Dr. Stewart says that in Kashmir, miles of the lakes and marshes are covered with this plant. The fruit is said to yield the Government of Kashmir £12,000 of annual income. Moorcroft states that Runjeet Sing derived nearly the same share. From 96,000 to 128,000 loads of this nut are yielded annually by the lake of Ooller alone. In the valley it furnishes almost the only food of 30,000 people for five months in the year.

The seeds contain a great quantity of fecula, and are eaten by the natives, either boiled or roasted; when boiled they are said to resemble a chestnut. The seed is also ground into a coarse flour, and cakes are made therefrom. The Chinese species is similarly employed in that country.

The flattened, triangular kernel of this nut or seed is from three-quarters to an inch in diameter, and about a quarter of an inch in thickness, internally white and friable, externally covered by a thin adherent brownish skin. Almost the whole of its substance consists of regular, oval or elliptical starch granules (fig. 2), with a central crack or hilum, sometimes stellate in rounded granules. The form of the starch granules, their regularity, and the character of the hilum, are sufficient to distinguish them from any others that we have seen.

Fig. 2. Starch granules of *T. bispinosa.*

In India the natives consider these nuts cooling, and that they cure bilious affections and diarrhœa. They are also used to form poultices. The red powder which is so freely used at the Hooly festival is made from the starch of these nuts, coloured red with the flowers of *Butea frondosa* or *Carthamus tinctorius.* The drug called "sweet hermodactyls," or *Surinjan shirin*, found in the bazaars of India, consists chiefly of the kernels of *Trapa bispinosa*, and sometimes they are also mixed with *Surinjan tulk*, or "bitter hermodactyls," as an adulteration.

NOTES ON CHALYBEATE WATERS.

BY JOHN MACPHERSON, M.D.

The following notes, though made with the view of determining the relative value of the strong Harrogate chalybeate, of which so much has been of late heard, are of a general nature, and may be useful at this season of the year.

There are exceedingly few mineral waters that contain chloride of iron in solution. Nay, it is usually supposed that chlorine has been erroneously assigned to iron by chemists, whose analyses of waters would show the presence of its chloride. Besides some waters in Java being said to contain chloride of iron, that salt has also been assigned to the following ones, and in the following proportions in the Prussian pint:—

	Harrogate.	Alexisbad.	Bukowina.
	gr.	gr.	gr.
Chloride of iron	1·6	1·083	0·920
Carbonate of iron	1·27	—	0·003
Sulphate of iron	—	0·574	1·966
Total iron	2·87	1·657	2·889
Total mineral constituents.	49·69	4·876	6·220
Carbonic acid	2·8 in.	traces	none

These three are, therefore, undoubtedly strong iron springs; but there are others stronger, without including the almost poisonous vitriol ones, as they have been called; for instance,—

	Wassenach.	Parad.	Muskau.
	gr.	gr.	gr.
Carbonate of iron . . .	3·08	4·8	1·385
Sulphate of iron	—	—	1·526
Total iron	3·08	4·8	2·911
Total mineral constituents.	12·9	12·4	8·673
Carbonic acid	traces	26 in.	traces

From these comparisons it appears that the Harrogate Muspratt well is not unique in being supposed to contain chloride of iron; that it does not contain iron in uniquely large quantity; and also, that it is by no means a pure spring, for after allowing for 22·5 grs. of common salt, which would not probably interfere much with the assimilation of the iron, it contains 27·2 grs. of other salts. Finally, the quantity of carbonic acid is very trifling.

Are strong iron waters like the foregoing ones well adapted for drinking? The general voice is against them, and they are usually employed only for baths. And it may be said that, in spite of all theoretical assertions of their styptic nature, iron waters are of little use for what are popularly termed steel baths, unless they contain a great deal of carbonic acid; for the non-absorption by the skin of solutions of salts in ordinary baths seems to be definitely settled by the recent inquiries of the Société d'Hydrologie, of Paris. Still, notwithstanding the presumption against such a spring as the Muspratt one, the accounts of the practitioners who use it are entitled to consideration. They assert that immense improvement often results from its use. Glandular swellings, low forms of gout, dyspepsia, and fatty heart, have all been found to yield to its influence. Such general statements are too often made respecting all waters, and from Dr. Myrtle's book I am much inclined to think that he has obtained at least as satisfactory results with the Tewit and the Kissingen well, containing as they do only ·14 and ·33 grain of carbonate of iron respectively. And he says of the Muspratt well, that its water must be given with much circumspection, that it is not only most difficult of digestion frequently, but is apt to cause some of the most painful physiological effects common to the ordinary preparations of iron.

If, then, general experience has shown that these strong iron waters are inconvenient for drinking, what strength of iron waters has practically been employed? Waters containing from ·35 to less than 1 gr. in 16 oz. of the carbonate of iron, waters not containing a large amount of solid ingredients and containing a good supply of carbonic acid—such are the waters the efficacy of which has been proved by the experience of centuries. This is well illustrated by glancing at the composition of the most popular chalybeate waters.

	Spa.	Schwalbach.	Pyrmont.
Carbonate of iron .	0·4	0·46	0·42
Other salts . . .	1·65	11·9	17·9
Carbonic acid . . .	20·1	45	40 inches

Or take a few excellent wells, not perhaps so widely known. Königswarth, near Marienbad, in Bohemia, at a height of 2000 feet; Elster in Saxony; Bocklet, close to Kissingen; Rippoldsau, on the whole the best of the Black Forest chalybeates, at a height of 1800 feet; or Liebenstein in Central Germany, as high as Schwalbach, or about 900 feet.

	Königswarth.	Elster.	Bocklet.	Liebenstein.	Rippoldsau.
Carbonate of iron	·65	·48	·67	·59	·67
Other salts . .	5·8	16·12	24·6	10·7	20·6
Carbonic acid .	37·2	32·9	37·3	40·9	32·8in.

All these are specimens of waters in which iron is presented in a shape rendering it easy of assimilation. I shall not enumerate the springs, such as Marienbad, or Franzensbad, or Harrogate, in which the quantity of sulphates or of common salt is so great as to make their action distinctly purgative. Two salt springs appear to have common salt in a desirable proportion. These are—

	Rakotski, Kissingen;	and Louisenwell, Homburg.
Common salt . .	44·7	23
Carbonate of iron	·33	·33
Carbonic acid .	41	32 inches

But even in them, and particularly in the Rakotski, there is too much common salt.

The great defect of our pure chalybeates, such as Tunbridge Wells or Llandrindod, is the want of carbonic acid to render the waters sparkling for drinking, or useful for baths. The warm chalybeates of Bagnères de Bigorre are also deficient in gas.

Perhaps the places where the best carbonated iron baths can be had are Schwalbach, Pyrmont, Liebenstein, Königswarth, Franzensbad, Elster, and St. Moritz. I believe that the new baths at Spa are good, but they do not contain the largest amount of gas.

With reference to St. Moritz, it is probable that its curative effects depend more on its climate during three months of the year and on its baths, than on its not powerful chalybeate. Those who are in search of stronger chalybeates than it affords would do well to go south and visit St. Caterina, at the same elevation as St. Moritz, or St. Bernardin, a few hundred feet lower, both with a large amount of carbonate of iron and of carbonic acid; or, if they will descend a little towards Italy, they will find two of the best chalybeates in existence, with a large supply of iron and carbonic acid, and minute quantities of carbonate of soda and of common salt—Rabbi at a height of about 1800 feet, and Pejo perhaps 100 feet higher. Proceeding further and fairly into Italy, he will find the more polished Recoaro, with less potent waters, however. The whole five are in beautiful scenery. The analysis of the waters of Pejo gives about 1 gr. of carbonate of iron, with carbonate of soda, 8·6; carbonate of lime, 1·8; common salt, 2·9; total mineral constituents, 15 gr.; carbonic acid, 31 inches: while Rabbi has 0·91 of carbonate of iron; carbonate of soda, 6·4; carbonate of lime, 2·3; common salt, 2·2; total mineral constituents, 12·6 gr.; carbonic acid, 29 inches. It is scarcely possible to have better combinations.

The war which has broken out since these lines were penned will compel those who will not venture into Switzerland and the Tyrol to make the most of our own chalybeates. At their head in England stand Tunbridge Wells and Harrogate, Llandrindod in Wales, Lisdunvarna in Ireland. Pannanich Wells, near Ballater, is almost the only chalybeate in use in Scotland. A host of such springs were formerly in repute in the three kingdoms.—*Medical Times and Gazette.*

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Continued from p. 96.*)

II. *Half-acid Ammonium Carbonate.*

History.—Rose first definitively obtained this salt in 1839,* but I think Hünefeld† came across crystals of it on cooling the aqueous alcohol from which he had distilled some commercial carbonate; for he described some of the crystals obtained by this cooling as rhombic plates, and, as crystals of the half-acid carbonate can thus be prepared, it is probable these were some.

H. St. Claire Deville obtained it in a different way in 1852, and gave an account of its crystalline form.‡

Preparation.—The half-acid carbonate was obtained by its discoverer by distilling some commercial carbonate at a gentle heat in a retort, the mouth of which was joined to a tube dipping under mercury, until the contents of the retort had become entirely liquefied, and setting aside the liquid thus obtained in a closed vessel to crystallize.

Deville dissolved commercial carbonate in concentrated ammonia-water at a temperature of about 30°, and

* Poggendorff's 'Annalen,' vol. xlvi. p. 373. Also Taylor's 'Scientific Memoirs,' vol. ii. p. 98.

† In 1836. Journ. für Prakt. Chemie, vol. vii. p. 25.

‡ 'Comptes Rendus,' vol. xxxiv. p. 880. Ann. de Chimie [3], vol. xl. p. 87.

set aside the solution to crystallize with or without the previous addition of alcohol. This method is not very satisfactory.

To the methods given by Rose and Deville I have to add two others quite different. The first and most important one is the last method given for preparing the normal carbonate. A concentrated solution of commercial carbonate in warm water is made in a loosely-closed vessel, and left to crystallize; the operation is repeated again and again with the mother-liquor and more of the carbonate of commerce, until in place of the compact crop of crystals at first obtained, a bulky and loosely-arranged crop of thin plates is produced; this and those succeeding it are crops of the half-acid carbonate.

By using not too great a charge of commercial carbonate, and allowing the crystallization to go on, in a place not too cold, crystals form and grow slowly to a considerable size; or large crystals may generally be obtained by decanting the mother-liquor, after twenty-four hours' standing, off the first or second crop of half-acid carbonate, and leaving it undisturbed in a closed vessel for some weeks.

A modification of this method is to heat some commercial carbonate in a retort with just enough water to cover it, at a temperature not exceeding 60°, until all is dissolved, then cooling the solution, and setting it aside to crystallize, when it yields the half-acid carbonate mixed with acid carbonate.

Pelouze and Frémy state, in their 'Traité de Chimie,'* that the half-acid carbonate, identical with that obtained by Rose, may be procured by cooling a solution of commercial carbonate to about 0°, and this statement reappears in one of our standard English works on chemistry. It is utterly at variance with my own experiments on the subject. When the solution has been strong enough to crystallize, the crystals obtained at 0° have always proved to be the acid carbonate. And further, if a solution which has deposited crystals at 0° is heated up with more of the commercial carbonate, and again cooled, the crystals which form are still those of the acid carbonate. Pelouze and Frémy are besides in this statement in direct opposition to H. St. Claire Deville, who, in his paper "Sur la Forme et la Composition des Carbonates Ammoniacaux,"† says that prismatic flattened crystals of the acid carbonate are produced by greatly cooling a solution of the commercial carbonate.

The other new process is the distillation of the ammonio-magnesian carbonate, the products being a fluid distillate, giving crystals of the half-acid carbonate, and a solid directly deposited in the neck of the retort of which the more remote parts are also this carbonate. Further details of the distillation will be afterwards given.

To ensure success in preparing the half-acid carbonate for analysis, similar precautions to those recommended for preparing the normal carbonate should be taken, and, as in the case of this salt, when the crystals are small a feeling of dampness in the drying-paper must be disregarded, and the operation arrested as soon as the crystals cease to make wet spots on bibulous paper pressed against them for a few moments.

Sensible Properties.—Half-acid ammonium carbonate has a very pungent ammoniacal taste and smell, but the pungency is less intense and persistent than that of the normal carbonate.

Form.—It occurs in the form of thin, elongated, six-sided plates, or, when these plates are left to grow in their mother-liquor, of flattened, right rectangular prisms, terminated by the faces of a rhombic octahedron.

Measurements of the angles of the crystals are given in Deville's paper in the 'Annales de Chimie.'

Chemical Composition.—Results of the analyses of the half-acid carbonate have been published by Rose and Deville in their respective memoirs already referred to. Rose deduced from his analysis the formula—

$$(CO_2)_3(OH_2)_5(NH_3)_4,$$

and Deville has adopted the same formula. My own experiments have led me to adopt a different formula, and the results of my analyses point unmistakably to the formula having four atoms of water. It must be taken into consideration that in no case can the samples analysed be quite dry, as the decomposition by which ammonia is liberated also sets free water; because the presence of this water must lower the numbers found for both the carbonic anhydride and the ammonia, thus making the numbers for the former correspond closely to the calculated number, in spite of the decomposition which the salt has undergone, and those for the latter show a greater deviation from the calculated number than the actual loss of the ammonia itself would cause.

The results of Rose's analyses correspond closely with the numbers calculated for a salt containing five atoms of water:—

Rose's Analyses.

	I.	II.	III.	IV.
Carbonic anhydride .	—	45·35	44·61	44·69
Ammonia	23·69	—	—	—

As I have already said, when speaking of the normal carbonate, the accuracy of the results of an analysis of such changeable salts depends very much upon the success in preparing them for analysis. Rose makes no mention of the method he adopted for getting the salt in the dry state undecomposed, or of his success in doing so; yet it will be seen, on examining his results, that the ammonia is slightly in excess of, while the carbonic anhydride is actually less than, the calculated quantity,—a somewhat anomalous result, admitting the accuracy of his analyses.

If it be assumed that the salt analysed, which was in very thin plates, retained some of the mother-liquor, this difficulty respecting the results will be removed; for the mother-liquor from the crystals was itself a solution of *normal* carbonate, according to Rose. This assumption we are justified in making; for it has been shown by Deville's results that other analyses recorded in Rose's paper prove that the crystals employed must have contained mother-liquor in their interstices. And in further support of this assumption, we have also Deville's testimony, that the half-acid carbonate can hardly be obtained at once dry and undecomposed.

Turning now to Deville's deduction of the same formula as Rose's, from the results he himself obtained, we shall not find it, I think, more satisfactory than that of the German chemist. He gives the annexed table of his analyses, the samples—none of them dry—being drier in the order of their numbers. (The water was determined directly.)

Deville's Analyses.

	I.	II.	III.	IV.	Mean.
Carbonic anhydride .	41·4	46·8	46·6	47·8	45·65
Ammonia	21·1	23·7	24·2	23·6	23·15
Water	37·5	29·5	29·2	28·6	31·20

The practical accuracy of these analyses, as such, cannot be impugned; they were performed with great precaution to avoid sources of error, and the three constituents were all determined by a single operation in each case. Now, their mean results correspond closely enough with the percentage numbers for the five-atoms-of-water formula. But then we are certainly not right in taking these mean results as a true indication of the composition of the salt. We can only properly take the mean results of a series of analyses as likely to be more accurate than the results of a single analysis, after we have satisfied ourselves that the unavoidable and undetected imperfections in the performance of the operations are as likely to have influenced each result in one direction as in the opposite. With the present series of analyses, we know

* Vol. ii. p. 483.

† Ann. de Chimie [3], vol. xl. p. 87.

this not to have been the case; but that, on the contrary, every sample used contained adhering water, and one more than another; and further, that every sample might have lost ammonia, while none could have had it in excess. Obviously, therefore, it has been wrong to take, as has been done, the mean percentage quantities of the constituents as the nearest approach to the quantities in the pure salt.

I shall now endeavour to show that the several results obtained unequivocally indicate, when taken in conjunction with each other, that the salt examined was a half-acid carbonate, having *less than five* atoms of water. All the samples, save the last, show but very slight evidence of loss of ammonia, and even in this the ammonia need only to have been 24·6 instead of 23·6 to be in the right proportion to the carbonic anhydride. All the samples were damp; but as the first sample yielded 8 per cent. more water on analysis than the second and third samples, equally free from decomposition, but better dried, no other conclusion can be come to than that either the first sample was a very wet one indeed, or else that a more hydrated half-acid carbonate breaks up, while in a moist state, into water and a less hydrated one,—which no one contends for, and which, from the facts of my own analyses, I cannot admit. In the second and third samples, the water is nearly 2 per cent. less than the calculated quantity for five atoms; and yet both had practically suffered no decomposition, and both were damp. How is it possible, therefore, from these results, to deduce for the salt the formula with five atoms of water? In the fourth sample, the water is even $2\frac{1}{2}$ per cent. less than the calculated quantity; but then this sample was somewhat decomposed. It is not too much to suppose that, as the first sample contained 8 per cent. more water than the others, these, moist as they were, still retained $2\frac{1}{2}$ per cent. of moisture. And I contend that, had the drying been carried on uninterruptedly, instead of in four stages, as was done, and with due protection of the salt from the free action of the air, more water might have been absorbed from the wet salt, without such a loss of ammonia as would have rendered the indication of the analytical results ambiguous. Even, however, as they stand, the results indicate the salt with four atoms, in a slightly decomposed and moist state; and in this state they are described to have been. They contain, in this moist state, only $2\frac{1}{2}$ per cent. too much water for this formula. I consider, therefore, that Deville's analyses in reality require the adoption of the formula with which my own analyses so closely agree.

It may be added that, when considering the relations and analogies of this salt, a fifth atom of water is found to render its composition peculiar, if not abnormal.

Chemical Behaviour.—I have little to say of the behaviour of the half-acid carbonate under circumstances capable of affecting it. The change it undergoes into acid carbonate, when exposed to the air, is quite analogous to that undergone by the normal carbonate:—

$$(CO_2)_3(OH_2)_4(NH_3)_4 = 3\,CO_2OH_2NH_3 + OH_2 + NH_3.$$

It is the difficulty of preventing this change, which renders so very doubtful the accuracy of Rose's analyses.* When heated, its crystals melt, and are decomposed. It is soluble in a little more than five parts of water at 15°; less water than this first becomes saturated, and then slowly decomposes the undissolved salt, leaving behind acid carbonate. Its solubility is, therefore, as nearly as can be stated, that of the acid carbonate it may be said to contain; 272 parts containing 158 parts of the acid carbonate, or about three-fifths of their weight. For the acid carbonate is soluble in 8 parts of water, and, therefore, three-fifths of a part in about 5 parts. A solution saturated at 20° evolves sufficient carbonic anhydride to repel the stopper of a bottle containing it; and, gently heated, effervesces copiously. A saturated solution, cooled, gives good crystals of acid carbonate. It is also decomposed by spirit, acid carbonate being left undissolved. Ammonia has, no doubt, an action upon it, compounded of its respective actions upon the normal and acid carbonates. In short, the half-acid carbonate seems to be intermediate in its other chemical properties, as it is in composition, to these carbonates.

When the half-acid carbonate is obtained by treatment of the commercial carbonate with water, the mother-liquor from the crystals is equivalent in composition to a solution of normal carbonate, with or without a slight excess of ammonia. And Rose also found that the mother-liquor from the crystals formed by his method was a solution of normal carbonate. From this somewhat remarkable fact the half-acid carbonate seems to be totally insoluble in a concentrated solution of normal carbonate. An explanation of this fact on another assumption will, however, be given in another part of this paper.

I may here mention one fact of interest concerning crystals of the half-acid and normal salts, viz., that they appear to act on the glass, both English and German, of the bottles and flasks in which they are stored for some time, destroying the transparency of its surface. I have not observed the solutions of these salts to do so.

* On allowing the crystals of half-acid carbonate to decompose in a limited quantity of air, Deville has observed crystals of acid carbonate form, which he thinks belong to a different system from that of the ordinary crystals of acid carbonate. ('Comptes Rendus,' vol. xxxiv. p. 880.)

PHARMACEUTICAL NOTES.

BY ALBERT E. EBERT.

Not the least duty of the pharmacist, though one more honoured in the breach than the observance, is his obligation to communicate to his fellows of the craft such improvements in manipulation, in apparatus, and in the convenient arrangement of his shop as his every-day experience behind the counter must occasionally suggest. How much practical, *desirable* information is hid under a bushel by this sin of omission we can only conjecture; but if the thousands would communicate their personal experience, it cannot be doubted that a valuable fund of useful knowledge would accumulate. The following suggestions are made with no great claim for their originality or importance, but, since they are based upon actual experience, they may be of utility to others as they have been to us.

Test-tubes, indispensable for their legitimate purpose, will often answer another useful end. For effecting solutions of small quantities of the alkaline or metallic salts, especially when the solvent is of a viscid nature, we have found the test-tube a valuable auxiliary,—more convenient in use than the mortar, less wasteful, and effecting the solution with greater dispatch. We proceed by dropping the salt into the tube, adding a portion of the vehicle, and applying heat, with constant shaking of the tube. Solution quickly follows; the warm liquid is added to the remainder of the vehicle, previously placed in the vial, and the whole is mixed by agitation.

Of course, the dispenser will see that this method of procedure is not applicable where the quantity of the salt exceeds its solubility in the whole liquid at ordinary temperatures, as crystallization would occur. This relation of salt to solvent is often met with, and then the only resort is to the mortar, in which the salt may be rubbed to powder before its mixture with the liquid, and the attachment of a "shaking label" to the vial. Solid extracts may be brought into solution by the same means with great facility.

The moral effect of such a display of chemical ware before the admiring eyes of the patient may be considered, in some rare instances, as equally beneficial with the product of the combined skill of the physician and pharmacist.

In spreading plasters extemporaneously, convenience requires, and neatness demands, an uncoated marginal edge. This is usually secured by pasting strips of paper along the edges of the skin, and removing them after the spreading of the plaster is effected. It is just here that a practical difficulty frequently arises. The paper edges are liable, from drying of the paste, to adhere so strongly that either paper or skin will give way upon an attempt at their removal; the application of water will then be necessary to soften the attachment, and the final result may be expected to present a daubed and uncleanly aspect. This difficulty may be entirely avoided by applying to the paste-brush a little glycerine before the adjustment of the marginal strips.

Coating of Pills.—A prevailing fashion in pharmacy, or rather among prescribers, is the use of sugar-coated pills. This is very detrimental to the practice of legitimate pharmacy, whatever may be its effect upon those who swallow the pills. An extemporaneous process of sugar-coating is a desideratum for which our colleges of pharmacy should unite in offering a prize. In the absence of this, a very excellent substitute may be found in resin. This substance is easily applied, gives a hard, tasteless surface, a handsome appearance, and has a decided tendency to protect the pills from change. The coating cannot interfere with their medicinal action, for it is readily dissolved by the fluids of the stomach. The process of coating is easy and expeditious, and no apparatus is required.

We proceed as follows, keeping prepared a solution of resin in ether, one part of resin to ten parts of the fluid. We return the pills, after they have been rolled to shape, to the mortar in which their ingredients were mixed, pour over them a little of the resinous solution, give the mortar a few twirls, and roll them out upon the platform of the pill-machine or pill-tile. By the time the label is prepared the pills will have become sufficiently dry to allow boxing. A little dusting powder, preferably lycopodium, should be dusted over them, and the work is done.

Speaking of pills, an idea occurs which is worth suggesting to the manufacturers of pill-machines, namely, that these convenient implements be made to cut thirty pills instead of twenty-four. The former number of pills is much more frequently prescribed than the latter. A great improvement would be the placing of numerals before each groove, so that the operator may not be obliged to count the grooves whenever a fractional number of pills are to be divided.

While making suggestions, we will continue by adding that there is a great need for vials, especially for half-, one-, and two-ounce vials, with lips suitable for dropping liquids. With the ware of the market at present, it is almost impossible for an expert to be successful in dropping; so what must be the experience of invalids and nurses in this respect? The defect may be easily remedied by making the lips of vials for such uses broad and *thin*. If we insist in demanding such improvements as we are suggesting, manufacturers will be eager to supply them.—*The Chicago Pharmacist*.

GLUCOSE.

We learn from the 'Grocer' that glucose is fast becoming an article of commerce. Some large parcels have been already received from the Continent, and, unless the lowness of the price obtained for it proves to be a bar to its free production, considerable quantities may be expected. It is offered in the form of huge blocks or cakes, but when specially prepared for the use of brewers, it undergoes a process of crushing that reduces it into small particles resembling grains of malt. It is not allowed by the Excise authorities to enter a brewery in a liquid state. By some brewers, especially those interested in the production of pale sparkling ales, it is preferred to either malt or sugar for obtaining sound and wholesome liquors, in which there is none of that acidity, impurity, or treacly sweetness which may be frequently detected in ales and beer brewed from the common classes of raw sugar. With confectioners, who require the addition of an almost colourless preparation for their more delicate manufactures, it is gradually taking the place of sugar.

CHEAP AERATED BEVERAGES.

The following analyses and remarks are taken from an article with the above title in the 'Food Journal' for August:—

"*Lemonade.*—A good and pure lemonade should show on analysis nothing but sugar and citric acid, and should have a pressure in bottle of at least 60 lbs. to the square inch. Six samples were tested with the following results:—

No.	Contents of bottles.	Citric Acid.	Sugar per bottle.	Tartaric Acid per bottle.	Sulphuric Acid.	Copper or Lead.
				grs.		
1	9 oz.	None	Nearly 1 oz.	9·21	None	None
2	½ pint	,,	About ½ oz.	20·46	,,	,,
3	8½ oz.	,,	,, ,,	17·50	,,	Trace.
4	8½ oz.	,,	,, ¾ oz.	17·50	,,	,,
5	½ pint	A little	,, ,,	40·00	,,	Large trace.
6	,,	None	,, ,,	20·60	,,	Trace.

"Thus we see that in the cheap lemonade there is rarely a trace of lemon-juice at all, the syrup being compounded of sugar, tartaric acid, and essence of lemons. In four cases out of six, poisonous metallic contamination was abundantly evident. The aeration was very imperfect, except in the case of No. 4, but even in that sample it fell far short of the proper amount. The lemonades were all more or less turbid, and, under the microscope, revealed myriads of organized germs and cells with a bright nucleus."

"*Ginger Beer.*—In the common ginger beer, we find that the rule is to reduce the sugar and the ginger to the minimum possible quantity, adding cream of tartar and capsicum to contribute the sharpness and pungency so in vogue with the drinkers of the article. The beer is also commonly contaminated with iron, we presume from the boilers in which it is made. Six samples of this beverage were also tested, with the following results:—

No.	Contents of Bottle.	Acetic Acid per bottle.	Cream of Tartar per bottle.	Total Solids.	Metals.
1	½ pint	2·63 grs.	2·0 grs.	187·6 grs.	Iron.
2	,,	7·75 ,,	3·6 ,,	137·1 ,,	,,
3	,,	11·00 ,,	4·0 ,,	226·0 ,,	Copper.
4	,,	9·60 ,,	4·0 ,,	172·5 ,,	None.
5	,,	2·30 ,,	3·5 ,,	244·5 ,,	,,
6	,,	5·60 ,,	2·7 ,,	205·4 ,,	,,

"This table shows that in all the beers acetic acid had been formed, and some, such as 3 and 4, were very bad in this respect. These same numbers are also to be distinguished by an extra dose of cream of tartar, while No. 3 was found to contain copper, presumably from the vessels used in manufacture. One bottle smelt so strongly of petroleum that its contents were undrinkable."

SEWAGE IRRIGATION.

The following letter from Mr. J. J. Mechi, of Tiptree Hall, on the above subject, has appeared in the 'Times,' under the heading "Waste":—

"Every well-wisher to the country who reflects upon the great sewage question, and its present condition, must feel humiliated by our national and willing helplessness and shortcomings as regards the disposal and utilization of this our vast food-producing treasure. The blundering from beginning to end has been immense. Our sanitary reformers, in their laudable desire to preserve our health, abolished our cesspools, poisoned our rivers, and deprived us of the only cheap and effective means for fertilizing our fields and filling our stomachs.

"A jury of Chinamen would pronounce us guilty of suicidal insanity, for in China their 400 millions of people depend mainly on human sewage for the production of their food,—they do not, like us, purchase birds' dung from Peru, or import the antiquated dust and ashes of foreign men and animals. Every one in Britain believes in the sheepfold, but about the man-fold, which is superior in its effects and results, there has been complete apathy.

"The voluntary principle has been tried and failed. Farmer So-and-So, near a town, declines to have the nasty stuff on his land, and so has obstructed its use. Some wholesome despotism, in railway fashion, by Acts of Parliament, has authorized Corporations and Boards of Health to take land for the purpose of receiving the sewage. London is, however, still an exception to this wholesome rule. We have expended four millions sterling in sewers to convey it into and to poison and obstruct our noble Thames, and have, for this worse than useless purpose, to pay a rate of threepence in the pound for some thirty or forty years, besides the heavy annual working expenses. Ratepayers are naturally indignant that such a valuable food-producing material should be wasted. The Thames Conservators have taken action by Parliamentary powers to prevent solid matters passing into the river. It must, therefore, go on to the land. But the extent of land required, who shall pay for it, and when it is to be paid for or liquidated, are important and difficult questions. Ratepayers very reasonably object to be mulcted in the cost of land which must improve greatly in value, and will, with the sewers, become a great boon to future generations.

"It appears to me that the rule which compels Boards of Health or Corporations to repay the whole cost of sewage in a few years, in addition to the interest and annual working expenses, is too stringent; and that, looking to the permanency of the works, the period of repayment should be considerably extended. The same remark holds good as to the purchase of land required to receive the sewage. It is the fear of imposing heavy rates for an early repayment that causes Corporations or Boards of Health to limit their purchase of land to a *minimum*. Why should they not be allowed to mortgage the land for long periods, thus easing the present ratepayers, and transferring a fair portion of the burden to posterity, who, by the improved value of the land, will be better able to bear it? Reliable evidence shows unmistakably that the rental and value of sewaged land increases year by year, and will continue to do so until it reaches its *maximum* of fertility. The sewaged Edinburgh meadows, the average annual value of which has risen to £27 per acre, prove this; land near Croydon, worth in its unsewaged state about 30*s.* per acre, was let when sewaged for £5 per acre, and now (the first seven years' term having expired) it is let, with an addition of 250 acres, at £9 per acre per annum, thus proportionately multiplying the value of the fee simple.

"A very large area would be required for the utilization and purification of the London sewage. We know that London consumes daily the annual available produce of 20,000 acres, and a similar quantity is required weekly for London horses.

"The average manurial power of Britain is equal to only two sheep or two human beings per acre. At that estimate London sewage should fertilize 1,750,000 acres. Such an area is, of course, at present out of the question; but taking the accepted impression that we should allow 100 human beings to each acre (or fifty times our general manurial power), even at this rate 35,000 acres would be required. To purchase this land at £50 per acre would cost £1,750,000; to prepare it for the reception of sewage by drainage, levelling, pumping, etc., would bring the probable cost to nearly £2,500,000.

"The Metropolitan Board of Works would hardly dare to exact a rate sufficiently large to liquidate this amount in a short period. The right of mortgaging during a century would remove the difficulty, or probably taking powers to resell the land when improved, reserving the powers of sewaging, etc.

"At all events, the recent action in Parliament of the Thames Conservancy will compel us to fertilize the land, rather than poison and choke our noble river."

Silk and Sunflowers in Mauritius.—We gather from the last annual report of the Royal Society of Arts and Sciences of Mauritius, that they had received a communication from the "Silk Supply Association," asking whether silk could be grown in the island, and laying down as a principle, that wherever the mulberry-tree will grow, there silk can be produced. The Society referred the question to a committee, who report unanimously that "not only can the mulberry be cultivated and the silkworm reared in Mauritius, but that an establishment founded on certain principles (which they indicate) would implant the industry of the silk-grower on a firm basis in the island." The committee feel so confident of success, that they offer to undertake the management of the establishment; and we notice that a specimen of silk grown in Mauritius, and reeled more than twenty years ago, was valued at 30*s.* a pound in the London market last January.

Another plant, the sunflower (*Helianthus annuus*), is to be cultivated, and seeds have been distributed among persons willing to undertake the task. It is popularly believed that plantations of sunflowers tend to improve local climates, by neutralizing the effect of marsh air and checking the liability to intermittent fever; and in some parts of Holland and the South of France the growth of sunflowers has been encouraged as a means of sanification. The same motive has led to the experiment now making in Mauritius, where some of the planters remark that, apart from all other considerations, the seeds of the sunflower yield a valuable oil and are much relished by poultry.

A climbing plant, known to botanists as the *Telfairia* (or *Joliffia*) *Africana*, was formerly abundant in Mauritius, but has, for some as yet unexplained reason, completely disappeared from the island. The plant being useful as well as ornamental, growing to a great height and bearing seeds which yield a rich sweet oil, is to be reintroduced; and at the request of the Governor, Sir Henry Barkly, a supply of seeds has been forwarded from Zanzibar by Dr. Kirk.—*Athenæum, July 30th.*

Clark's Water-Softening Process.—It appears that the patent for this process has expired, and that anybody can use it now that likes to do so. Seeing that the London water companies have us entirely at their mercy in the matter of water supply, it would be only a gracious act if they were to determine henceforth to apply Clark's softening and purifying process to the whole of their respective supplies. If the companies decline this spontaneous manifestation of regard for their customers, it may be worth while for the Home Secretary to remember this point in his promised legislation upon the recommendations of the Royal Commission on Water Supply.—*Lancet.*

Adulteration of Carbonate of Soda.—The 'Antwerp Journal of Pharmacy' calls attention to the practice of adulterating carbonate of soda by mixing with it a proportion of sulphate of soda. At first sight the admixture is not apparent, though the two salts differ essentially from each other, both in their crystallization and their chemical properties. The fraud is one that may easily be detected by a chemist.

The Pharmaceutical Journal.

SATURDAY, AUGUST 13, 1870.

PHARMACEUTICAL EXHIBITIONS.

The practice of holding periodical exhibitions appears to be gaining favour not only in this country, but also in America, for a circular just received from Mr. J. Faris Moore, announces that at the eighteenth annual meeting of the American Pharmaceutical Association, to be held in Baltimore, on the 13th September next, there will be an exhibition of objects relating to Pharmacy and the Collateral Sciences. It adds that the exhibition has become a prominent and interesting feature of the Association's annual meeting, constituting an exponent of the progress of chemical and pharmaceutical industry, besides affording an excellent opportunity for the manufacturer and wholesale dealer to make his name and goods known to the trade.

Following the precedent established at Nottingham and Norwich, the Liverpool Local Committee of the British Pharmaceutical Conference has decided to hold an exhibition of objects relating to Pharmacy, or having a special interest for members of the drug trade, during the meeting which is to commence on Tuesday, the 13th of September, under the presidency of Mr. Stoddart. The central position of Liverpool, its commercial importance, and the proximity of large chemical manufactories, constitute special reasons for holding such an exhibition there. The objects which it is desirable should be represented are—

1. Novelties or improvements in pharmaceutical processes, including apparatus and utensils for evaporation, distillation, pulverization, displacement, filtration, etc. Applications of gas and steam are especially desired. Models or drawings will also be eligible.
2. Instruments intended for use in chemical investigations, such as apparatus for volumetric analysis, spectroscopes, polarizing apparatus for testing the purity of pharmaceutical preparations, etc.
3. Microscopes, microscopic accessories and objects.
4. New medicines and medical appliances, as galvanic and electro-magnetic machines, enema-syringes, etc.
5. Illustrations of general business fittings and arrangements for dispensing.
6. Improved dispensing appliances, as bottles, boxes for pills and powders, labels, etc.
7. Poison bottles, poison labels, etc. Illustrations of precautions against mistake, either by dispenser or patient.
8. Improved preparations for the administration of medicines. This class would include methods for disguising nauseous remedies by means of capsules, also the various coatings of pills, also improved suppositories and pessaries, liquors and other substitutes for alcoholic tinctures. Artificial mineral waters.
9. Specimens of drugs or chemicals remarkable for fine quality, or for other reasons. Illustrations, botanical or mineral, of the sources of medicines.
10. Foreign preparations, proprietary or otherwise.
11. Illustrations of adulterations, and the means of detecting them.
12. Improved dietetic preparations.
13. Books, English or foreign, relating to pharmacy or the collateral sciences.
14. Historical relics, having an interest in connection with pharmacy, or its cultivators, as portraits, autographs, etc.
15. Any improvements within the scope of the drug trade, or consistent with it, but which are not embraced by previous classes.

The following Regulations are to be observed —

Objects for exhibition are to be delivered at Liverpool free of carriage on or before September 8th, advice being sent at the same time by post, and an invoice of their value, stating whether intended for sale or not; and descriptive accounts written on one side of the paper only should accompany all articles sent. The Committee will take charge of unpacking and re-packing articles sent for exhibition, but whilst every care will be taken, they cannot be responsible for damage. The Committee reserve the right to decline any objects they may consider unsuitable.

A report upon the Exhibition will be prepared by a Special Committee, and published in the 'Proceedings of the British Pharmaceutical Conference,' and intending exhibitors should apply at once to the Hon. Secretary, Mr. E. Davies, Royal Institution, Liverpool.

A similar exhibition is now being held at Newcastle, in connection with the British Medical Association, and, among other objects of interest to medical men, new drugs, chemicals, and preparations of food are represented by several well-known pharmacists.

CHEMISTS' WEIGHTS AND MEASURES.

For some time past considerable activity has been manifested by the local authorities of Islington, in reference to incorrect weights and measures, and recently eighty-four persons were fined. In most instances there appears to have been no intention to defraud, but it is worth noticing that there were no less than sixteen chemists among those who were fined. It appears, according to a statement in the 'Grocer,' that one of those who suggested greater activity on the part of the inspectors was a chemist, and that he was also one of the first victims of the course he had suggested.

THE YEAR-BOOK OF PHARMACY.

We acknowledge the receipt of a specimen-page of this projected work, and are glad to find that there is a steady progress towards its actual publication. The Executive Committee of the British Pharmaceutical Conference reported last year, at the Exeter Meeting, that, in considering whether the compilation and issue of such a work would be desirable, it was felt that since similar works, in connection with various sciences, are published in most other countries, and are found to advance knowledge beneficially, Great Britain should not be without such a yearly report. It was the opinion of the Committee that the publication of a work of the kind would further the best interests of pharmacy and pharmacists. It was considered that the necessary funds for the publication of this 'Year-Book' would be obtained if some five hundred new members joined the Conference, and we understand nearly that number of additions has already been obtained. With such a desirable object immediately before British pharmacists, we anticipate a still larger accession to the ranks of the Conference at Liverpool.

The 'Year-Book' is to include notices of all pharmaceutical papers, new processes, preparations, and formulæ published throughout the world.

THE BRITISH MEDICAL JOURNAL.

It is with great pleasure we learn that Mr. Ernest Hart has been unanimously elected editor of this journal, which is the organ of the British Medical Association. As might have been expected, Mr. Hart's claims were recognized and strongly urged by many leading members of the medical profession, and we congratulate the Association on having secured the services of so talented an editor to fill up the vacancy caused by Mr. Jonathan Hutchinson's resignation.

In another part of the Journal will be found the Act for regulating the Sale of Poisons in Ireland. It is simply an extension of the Act applying to Great Britain.

Mr. H. Alder Smith has been elected Resident Surgeon to Christ's Hospital, in the room of Mr. Stone, resigned. Mr. Smith was formerly a pupil in the Laboratory of the Pharmaceutical Society, and we are glad to find that the distinction he gained as a student there and elsewhere is being followed by practical success.

Mr. Porter, who was killed at the Hastings Sewage Works last week, was formerly a student in the Laboratory of the Pharmaceutical Society.

The 'Times' is authorized to state, in answer to frequent inquiries, that the North German Government does not object to admit British medical men as volunteers in their army hospitals, provided that they speak German fluently, that they have the licence to practise medicine and surgery in the United Kingdom, that they have the permission of their Government to serve as medical volunteers in Germany, and that they will place themselves unconditionally at the disposal of the North German Government.

The 'Lancet,' in speaking of the Second Report of the Rivers Pollution Commissioners, says that "the public, now fully sensible of the folly of turning the *débris* of our food and bodily waste into our rivers and the sea, polluting them to an extent which made their condition destructive of public health and comfort, have been fascinated with a fiction that alum, blood, and clay possessed the charm of preventing contamination, and, at the same time, became the medium of restoring to the land those fertilizing agents which had been extracted in the formation of food." It adds, that these illusions are made to disappear by Dr. Frankland's investigation of the subject,—the general conclusions he has arrived at being those stated in our notice of the Royal Commissioners' Second Report* just presented to Parliament.

The Société de Pharmacie have named a commission, consisting of MM. Jungfleisch, Coulier, Baudrimont, Limousin, and Regnauld, to inquire into the causes of the accidents which occur in the preparation of oxygen by heating chlorate of potash with peroxide of manganese.

The 'Medical Times and Gazette' announces, in reference to the suggestion for a memorial to the late Sir James Clark, that when it was brought to the notice of his family a desire was expressed by them that it should not be carried out. Although they feel deeply the kindness of the proposal, they consider it doubtful whether such a memorial would have been wished for by Sir James, inasmuch as he did not approve of the practice of subscriptions for such purposes. While thanking those who entertain the desire, the family hope that their friends will not be hurt by a request not to move further in the matter.

The drawings of *Cinchonæ*, made under the superintendence of Dr. Mutis at the end of the last century, are about to be published. It will be remembered that they were discovered by Mr. Clements R. Markham in an outhouse in the Botanical Garden at Madrid, together with some of Dr. Mutis' MSS., a part of which was published under the title of 'The Cinchona Species of New Granada,' for her Majesty's Stationery Office, in 1867, by Mr. Markham.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

August 3rd, 1870.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Atherton, Bottle, Bourdas, Brady, Edwards, Groves, Hills, Reynolds, Savage, Stoddart, and Woolley.

The minutes of the last meeting were read and confirmed.

Mr. Woolley desired to move that the portion of the minutes referring to the grant of an annuity to Dr. Redwood should be excepted from confirmation, but, it being ruled that according to the Bye-laws, Section 6, Clause 3, "All resolutions carried at the meetings of the

* See Pharm. Journ. No. 4, p. 67.

Council, except such as relate to the Bye-laws, shall be acted upon without confirmation," he was deemed out of order. Mr. Woolley thereupon lodged a protest against the funds of the Society being dealt with in such a summary manner as that in which the grant to Dr. Redwood was voted.

The following letter, received by the President from Dr. Redwood, was read:—

"*To the President and Council of the Pharmaceutical Society of Great Britain.*

"Gentlemen,—Although I deeply regret the decision of your Board by which I have been removed from the position I so long occupied as Editor of the 'Pharmaceutical Journal,' I must beg to express to you my thanks for the liberal spirit in which you have acknowledged the services I have endeavoured faithfully and zealously to render to the Society from its first formation, and which I shall still hope to find some means of continuing to render.

"I am, yours truly,

"T. REDWOOD.

"*August* 1*st*, 1870."

It was moved by Mr. Bottle, seconded by Mr. Savage, and

Resolved unanimously—That the President be requested to forward to Mrs. Orridge, on behalf of this Council, a letter of sympathy and condolence in her recent bereavement, and that a minute thereof be entered in the Transactions of the Society, as a recognition by the Council of the valuable services rendered to the Society by the late Mr. B. B. Orridge, and more especially so in furthering the objects of the Benevolent Fund.

A letter from the Medical Department of the Privy Council Office was read, confirming the appointment of the two Examiners for Scotland, Henry C. Baildon and Alexander Noble, nominated at the last meeting of the Council.

The Report of the Finance Committee was presented, showing on the General Fund account a balance in the Treasurer's hands of . . . . . . £986. 5*s*. 9*d*.
And submitting for payment accounts, etc., amounting to . . . . £711. 16*s*. 6*d*.
On the Benevolent Fund Account, a balance of . . . . £560. 11*s*. 11*d*.

Resolved—That the Report be received and adopted, and payments made.

Resolved—That the Treasurer be requested to purchase the following Government Securities:—
Consols. Benevolent Fund Account . £461. 12*s*. 10*d*.
New Three per Cents. General Fund Account . . . . £1200. 0*s*. 0*d*.

And for this purpose the £1000 on deposit account at the Bankers' was ordered to be withdrawn.

The Report and recommendations of the Library, Museum, and Laboratory Committee having been read, it was

Resolved—That they be received.

Resolved—That the Report of the House Committee be received and adopted.

On the recommendation of the Committee for the appointment of Sub-Editor of the 'Pharmaceutical Journal,' it was

Resolved—That Francis Passmore be appointed, at a salary of £150 per annum.

The Report and recommendations of the Benevolent Fund Committee having been read, it was

Resolved—That the sum of Ten Pounds be granted to a Member at Oxford.

The Board of Examiners reported that one Candidate presented himself for the Senior Bell Memorial Scholarship, and seven for the Junior.

The former failed to obtain the requisite number of marks in his examinations to establish his title to the Scholarship.

The Junior Scholarship was awarded to Henry Churchill, with free Laboratory instruction and materials for the Session 1870–71.

SESSIONAL PRIZES.*

The Board reported that during the past Session twenty-nine Candidates had passed the Minor Examination in honours, of whom eleven had competed for the Prize of Books.

On the report and recommendation of the Board, the prize was awarded to Edward Alfred Webb.

The Professors presented their respective Reports of the results of the competition for the Prizes offered by the Council, which, having been read, the following awards were declared:—

CHEMISTRY AND PHARMACY.

Bronze Council Medals . . Equal { Charles Fryer.
Frederick Hamilton Peck.
Certificate of Honour . . Henry Forster.

BOTANY AND MATERIA MEDICA.

Bronze Council Medal . . Edward Alfred Webb.
Certificates of Honour . . Frederick Hamilton Peck.
Charles Fryer.
Certificates of Merit . . . . Henry Forster.
John Pim Jackson.
Everton Sainsbury.

PRACTICAL CHEMISTRY.

Bronze Council Medal . . Charles Fryer.
Certificates of Honour . . George Bult Francis.
Thomas Fütcher Best.
William Raffle.
Everton Sainsbury.
Edmund Henry Metcalfe.
Certificates of Merit . . . . Edward Alfred Webb.
Frederick Hamilton Peck.

The Professor of Botany reported that four Herbaria had been received in competition for the Prize.

The following awards were made:—

Silver Medals . . . . Edward Rammell.
Edward Alfred Webb.
Certificate of Honour . . Alexander Wood.
Certificate of Merit . . . . Charles John Stansby.

Notice of Motion.—Mr. Savage, Mr. Brady,

That in the Sessional Examination in future Silver Medals be awarded for the first prize, and Bronze Medals for the second. Certificates of Honour and Merit as heretofore.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted Diplomas stamped with the seal of the Society:—

Adams, Frank . . . . Stoke-on-Trent.
Bland, Thomas Frederick . . . . Stourbridge.
Clarke, Richard Feaver . . . . . . Torquay.
Cotterill, Samuel . . . . Southampton.
Gibbs, James . . . . Bedford.
Griffiths, Waldron . . . . Harrow-on-the-Hill.
Hartt, Charles Henry . . . . Torquay.
Howie, William Lamond . . . . . . Edinburgh.
Jackson, John Pim . . . . Leeds.
Mason, Robert William . . . . . . Rugby.
Pilley, Henry Thomas . . . . Lincoln.

* The Sessional Prizes and Certificates will be distributed at the Evening Meeting on the 5th October next. Successful candidates will be expected to attend. An Address to the Students will be delivered by Mr. Schacht, of Clifton. Ladies are invited to be present.

Pitts, Phineas Reynolds ...... Hingham.
Raffle, William .... South Shields.
Robson, James Crosby .... Darlington.
Romano, Frederick William Richard .... Rio Grande do Sul.
Thompson, William Milner .. Thirsk.
Walton, Jonathan Sparke .... Haydon Bridge.
Webb, Edward Alfred .... Clapham.

Resolved—That the following Pharmaceutical Chemists be and are hereby elected Members of the Society:—

Bland, Thomas Frederick .... Stourbridge.
Clarke, Richard Feaver ...... Torquay.
Dewson, Frederick Stokes .... Birmingham.
Hanson, Thomas .... Bombay.
Pitts, Phineas Reynolds ...... Hingham.
Robson, James Crosby .... Darlington.
Romano, Frederick William Richard .... Rio Grande do Sul.

William Thomas Phillips, of Carmarthen, having paid his subscription for the current year (due 1st of January last), and a fine, was restored to membership.

Resolved—That the following Registered Chemists and Druggists be elected Members of the Society:—

Balcomb, John .... Cheltenham.
Bowden, William .... Patricroft.
Clarke, Thomas Allen ...... Horncastle.
Hopkinson, Thomas .... Grantham.
Johnson, Joseph Garwood .. Barnsley.
Kingsford, Frederick ...... 54, Piccadilly, London.
Knowles, Charles W. ...... Thorne, Yorkshire.
Lockwood, George Alfred .. Sheffield.
Newham, Benjamin .... Sheffield.
Place, William Byron ...... Betley.
Riches, Thomas .... Torquay.
Sharples, George William .. Blackpool.
Shipley, William .... Ashbourn.
Stockman, Frederick ...... 200, Essex Rd., London.

The following, having passed the Modified Examination, and being in business on their own account, were elected Associates, with the privileges granted by Sect. 20, Pharmacy Act, 1868.

Clift, Martin Luther .... London.
Jarvis, John .... Dunstable.
Searle, William George ...... Manchester.

The following, having passed their respective Examinations, were elected Associates of the Society:—

Minor.

Butterfield, Edward .... London.
Butterworth, Albert .... Sowerby.
Bowen, John William .... Handsworth.
Braddock, Henry .... Oldham.
Carroll, Denis .... Dublin.
Clark, Walter Beales .... Leicester.
Diaper, Albert .... Bury St. Edmund's.
Green, Marryat H. .... London.
Habgood, Henry .... Wells.
Haydon, William Frederic .... Blandford.
Hogg, Joseph Fawcett .... North Shields.
Keightley, Joseph .... Tunstall.
Longley, John William ...... Leeds.
Margetts, George William .... Fakenham.
Page, William Henry .... London.
Storey, Edward Henry ...... London.
Sumner, Benjamin T. .... Horncastle.

Modified.

Atkinson, Leonard .... London.
Bates, John Freer .... Manchester.
Dawney, Charles .... Exeter.
Deane, Frederick Dawson .... Jersey.
Dodds, John Henderson ...... Walsall.
Grindell, John .... London.
Jenkins, David .... Bridgend.
Johnson, Henry .... Barnsley.
Moyle, Joseph .... London.
Organ, Edward .... Bristol.
Perkins, John Jaquest .... Stafford.
Rowell, John Childs .... Reading.
Scott, Joseph .... Worcester.
Smith, John Charles .... London.
Squire, James .... Lewes.

The Secretary reported that the Local Secretaries appointed at the last meeting of the Council for Aberdare and Oxford had declined to accept office; whereupon it was

Resolved—That the following be appointed:—

Pratt, Joseph, for Aberdare.
Tuck, John, for Oxford.

The Registrar was authorized and directed to remove from the Register of Chemists and Druggists the name of Edward Charles Whisken, of Welchpool.

The consideration of the precautions necessary for the "Sale and Keeping of Poisons" was again deferred.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The Secretaries of the Pharmaceutical Conference have issued a circular announcing that the seventh Annual Meeting will be held in September next, at Liverpool, in the Royal Institution, under the presidency of Mr. W. W. Stoddart, F.C.S., F.G.S. On Tuesday, the 13th, at 10 A.M., the President will deliver an address; the reading and discussion of papers on pharmaceutical subjects will then commence, be continued in the afternoon till 4.30, and be carried on during Wednesday; an adjournment from 12.30 to 2.0 taking place each day.

Members intending to be present are requested to communicate with the Local Secretary, Mr. E. Davies, Royal Institution, Liverpool, who will give all information concerning lodging and hotel accommodation, etc.

"The facilities for communication with Scotland and Ireland, as well as all parts of England, render it probable that this meeting will be very numerously attended.

"There is much connected with the trade of Liverpool which cannot fail to be interesting to strangers. The river Mersey, with its line of docks, five miles in length; the great works at Birkenhead; the large warehouses, fitted with the latest mechanical appliances; the quay sides, covered with the various produce of all climes; and the numerous charitable institutions on the river, offer a class of attractions almost peculiar to Liverpool; while its shipbuilding yards, foundries, chemical, and various other works on an extensive scale, and its vicinity to the mining and manufacturing districts, enable it to meet the tastes of all classes of scientific men. The proximity of Chester and the coast of North Wales places many interesting spots within easy reach."

An exhibition of objects relating to pharmacy will be held this year in connection with the meeting of the Conference. Such exhibitions are found to stimulate pharmaceutical industry, promote original research, and supply a personal element of interest to the transactions of our Association. The central position of Liverpool, and its high commercial importance, will probably induce a large number of pharmacists to exhibit on this occasion.

Gentlemen engaged upon any investigation, are reminded that papers are expected to be sent in to the Secretaries fourteen days before the Annual Meeting, accompanied by a short abstract for insertion in the local and other newspapers.

Authors are specially requested to send the titles of their papers to either of the General Secretaries two or three weeks before the Annual Meeting. The subjects will then be extensively advertised, and thus full interest be secured.

Members disposed to accept any of the unaccepted subjects suggested for investigation in the list sent to them in the early part of the year; work on any subject suggested by themselves; propose any subject for investigation by others; forward for analysis specimens of drugs and chemicals whose examination might tend to throw light on the question of adulterations and impurities; propose the recognition of any Pharmaceutical Association and reception of its delegates by the Conference; nominate gentlemen for membership, or make any suggestions or propositions, are requested to advise the Secretaries.

The objects of this Association of Pharmacologists and chemists and druggists are:—

(1) To increase the common stock of pharmaceutical knowledge, and

(2) To promote community of interests among those engaged in pharmacy.

In addition to the existing means of attaining these ends, the Committee will in future issue to members an Annual Report on the progress of pharmacy,—a Year-Book, containing notices of all pharmaceutical papers, formulæ, etc., published in the various scientific journals of Europe and America. For the annual subscription of 5s., each member will thus receive a tangible *quid pro quo* in addition to the yearly volume of 'Proceedings.' The necessary funds for accomplishing this object can probably be obtained without making any charge in addition to the present subscription, if *five hundred new members be added to the ranks.*

The Executive Committee call on every chemist and druggist to offer his name for election, and on every member to make an effort to obtain more members. Nominations will be received by either of the officers.

Copies of letters of invitation to membership will be sent to any member willing to sign and forward them to friends interested in pharmacy.

HUNTERIAN MEDICAL SOCIETY.

August 3.

At a Special Meeting held in the Theatre of the London Institution, Baboo Gopaul Chunder Roy delivered a lecture on the state of medicine in India prior to the British rule. The President of the Society, Mr. Jonathan Hutchinson, introduced the lecturer, who stated that he had come to England as a candidate for an appointment in the India medical service, but had found, on his arrival, that no examination was to take place. He then referred to the high state of civilization which existed in Eastern countries in very early ages. There was good reason for believing that astronomy had its origin in India, and in that country medicine attained, at an early period, a high degree of development. An advance, however, was arrested by the Mohammedan conquests; and therefore Hindoo science, remaining as it did at the point where it was centuries ago, presented a strange contrast with modern science. The physicians of India had sprung from two of the castes—the Brahmins, who were the most highly educated and from whom the priests were chosen, and the Boyshos or traders, who were not allowed to learn Sanskrit or to reach the higher education of the Brahmins. Medicine and surgery were distinct; the latter being entrusted to barbers, whose operative skill was very limited. Medicine was from very ancient times divided into anatomy, materia medica and the treatment of diseases. The study of anatomy was very imperfect, in consequence of the prejudices against handling dead bodies. What knowledge of anatomy the Hindoo possessed, was gained from the dissection of goats; and an acquaintance with the human skeleton was obtained by allowing bodies to remain in water till the bones and ligaments alone were left. The umbilicus was supposed to be the centre of the vascular system. The blood was regarded as a mixture of humours. The materia medica attracted attention at an early period; and the articles were described with a view to their dietetic as well as to their therapeutic properties. Mercury, arsenic, iron, and several other mineral remedies were known in Hindoo medicine many centuries ago. Gold dust entered very extensively into the formulæ; perhaps not so much for the sake of increasing the therapeutic value of the medicines as their cost. Sesquioxide of iron was the chief basis of tonic remedies. Arsenic had been long used in the treatment of intermittent fever. There were a large number of remedies belonging to the vegetable kingdom in use in India from remote ages, some of which, as bael, chirayta, etc., had been adopted in the 'British Pharmacopœia.' Baboo Chunder Roy recommended a careful investigation of Indian medicinal plants; believing it probable that among them would be found some valuable remedies for the prevalent diseases of the country. In works on the practice of medicine, the description of symptoms was very exact, but the treatment was empirical. In fevers, low diet was enjoined; the patient was kept for forty-eight hours without medicine; then bitters and purgatives were administered; and then, if the fever persisted, arsenic in divided doses. This treatment rarely failed to arrest the disease in ten days; but it left the patient's constitution in an impaired state. Surgery was in old times entrusted to barbers, whose practice was limited mostly to the treatment of ulcers, abscesses, etc. But for ages there had been persons who performed the operation for depression of cataract, cupping (by means of cow's horns), bleeding (in the calves of the legs), etc. Hygiene had long held a place in the Hindoo system, being mixed up with religious rites. Washing in the Ganges was thus made a religious ceremony. The flesh of the ox was forbidden, on account of the use of the animal in agriculture, and of the cow in yielding milk; and that of the pig on account of the filthy habits of the animal. Dry earth had been long used for removing offensive smells. Change of climate, in the form of pilgrimages to distant lands, had long been a remedy in chronic diseases. With all this, there was ignorance of some of the fundamental principles of hygiene. Poison and pure air were in the same category; and a Hindoo sick-room was rigidly closed at all points. Turning, next, to the British rule, the lecturer referred to the influence of a surgeon, Mr. Broughton, in establishing the East India Company in India in the last century. The idea of founding an English medical university in Calcutta arose in 1836. At first there was great difficulty, on account of the religious prejudices, in obtaining students; and goats and dry bones were for some time the only objects on which anatomy could be studied. The necessity for dissection was at last strongly felt; and it was a memorable event when Baboo Modoosudun Gupto first broke through the prejudices of his race, and dissected a human body. From this time, medicine advanced; a hospital was founded; and degrees were given by the University. Baboo Chunder Roy complained that the degrees in Medicine of the Indian Universities were not recognized in England. They were obtained only after stringent examination; and in not one instance where the native holders of them had come to England to undergo the competitive examinations for the Indian Medical Service, had there been a failure. It had been said that the preliminary training was deficient; but it should be remembered that Sanskrit stood in India in the place of Latin, and that English itself was a foreign tongue to the Hindoos. He complained of the low estimate in which the native graduates of the Indian Colleges were held, and trusted that means would be taken to remove the stigma of inferiority which was attached to them.

ROYAL SOCIETY.

May 19, 1870.

Experiments on the Effects of Alcohol on the Human Body.

BY DR. E. A. PARKES AND COUNT C. WOLLOWICZ.

An important series of experiments on this subject has been made conjointly by the authors. Their object was to ascertain the physiological and dietetic effects of alcohol on the human body in a state of health. The plan of observation was as follows: For twenty-eight days a man, an intelligent healthy soldier, remained on a diet precisely similar as to food and times of meals in every respect, except that for the first eight days he took only water (in the shape of coffee, tea, and simple water); for the next six days he added to this diet rectified spirit, in such proportion, that he took in divided quantities, on the first day 1 fluid ounce of absolute alcohol; on the second day 2 fluid ounces; on the third 4 ounces; and on the fifth and sixth days 8 ounces on each day. He then returned to water for six days, and then for three days took each day half a bottle (12 ounces) of fine brandy, containing 48 per cent. of alcohol. Then for three days he returned to water. There were thus five periods, viz. of water drinking, alcohol, water, brandy, water. And for ten days before the experiments were commenced, the man, a beer drinker usually, abstained from any alcoholic liquid for ten days. The food taken was all weighed, it was the ordinary diet. The general results obtained may now be very briefly summed up. It would seem first of all that, other conditions remaining the same, the weight of the body is unaffected by the taking of alcohol. With regard to temperature, we are told "that the general result from all observations surprised us (the observers), considering the numerous experiments on men and animals in which the temperature has been found to be lowered by alcohol." The tendency, indeed, was rather in the opposite direction, especially with the brandy. The alcohol was, however, never pushed far, because the object was not to induce any narcotism, but to ascertain its dietetic value; and the discrepancy involved in the observations of Drs. Parkes and Wollowicz may be in part further explained by the fact that the individual experimented upon possessed a perfectly healthy resisting, and not a diseased or weakened organism. The diminution of temperature by large and narcotic doses is not disputed; all that our experimenters affirm is that with a small amount of alcohol, and a good supply of food, the temperature is not diminished. The effects on the circulation described are very interesting. The pulse was not only more frequent and fuller when alcohol and brandy were used, but the increased frequency was persistent after the omission of the alcohol. The pulse had not reached in six days the point which was proper to it before the alcohol was given.

The first day of alcohol gave an excess of 4, the last 23 per cent. in the beats of the heart, that is, an excess of 13 per cent. as a mean of six days. This, on calculation, amounts to an excess in the daily work of the heart equal to lifting 15·8 tons one foot during the first two, and 24 tons during the last two days of the alcoholic period. On the fifth and sixth days after the alcohol was left off, when its elimination was complete, the heart showed in the sphygmographic tracings signs of unusual feebleness; and when subsequently brandy was given, it was clear that it was acting upon a heart whose nutrition had not been perfectly restored. The observers say that it is evident that in the man experimented upon, the amount of alcohol the heart will bear without losing its healthy sphygmographic tracing is small, and it must be supposed that eventually some disease of the heart will follow the excitement induced by large doses of alcohol. The action on the kidneys of a moderate amount of alcohol is not marked; the amount of water eliminated is rather increased; no change takes place as regards the nitrogen when the ingress of nitrogen is constant,—certainly it is not diminished in amount. This conclusion is antagonistic to the observations formerly made on the point, which indicated that nitrogen is retained in considerable amount in the body under the exhibition of alcohol, which in this way increases assimilation, and when food is deficient saves the tissues from waste.

Little change is also effected in the phosphoric acid, the chlorine, and the free acidity of the urine. The elimination of nitrogen by the bowels was not lessened. The elimination of alcohol by the lungs was marked; indeed a good deal must have been got rid of in this way,—by the skin considerable, by the kidneys slight. Drs. Parkes and Wollowicz think that, though not excessive at any one time, the exit is longer continued than Anstie and Dupré suppose.

Special note was taken of the effect of alcohol on digestion and appetite. It seems that in the man under observation some point near two fluid ounces of absolute alcohol is the limit of useful action on appetite. It might have been found to be less, had the experiments been continued. Further, although large doses interfered with the appetite, they did not interfere with or retard primary digestion, as far as could be seen, nor the normal chemical changes that result in the elimination of nitrogenous excreta, phosphoric acid, and the like. In a word, no evidence was forthcoming to show that alcohol either saved or exhausted the tissues; that is to say, the good or evil ascribed to alcohol in this direction was not observed by Dr. Parkes and Dr. Wollowicz in the healthy man. It may be, of course, different in disease. The effect on the nervous system was shown only by subjective symptoms,—headache, heaviness, loss of cheerfulness and alacrity, torpor and sleepiness; and narcotism was induced by an amount of alcohol less than 4 and nearer 2 ounces daily, and the experimenters conclude that the narcotism, the loss of appetite, and the increased frequency in the heart's beats, are related to the common cause, viz. implication of the nervous system. The general inference of the experimenters on this point is that something under 2 fluid ounces of alcohol could be taken daily without harm by the man under observation. The following are the final conclusions given by Dr. Parkes and his coadjutor. "It will be seen that the general result of our experiments is to confirm the opinion held by physicians as to what must be the indications of alcohol in health and disease. The effects on appetite and on circulation are the practical points to seize; and if we are correct in our inferences, the commencement of narcotism marks the point when both appetite and circulation will be damaged. As to the metamorphosis of nitrogenous tissue, it seems improbable that alcohol in quantities that can be properly used in diet has any effect; it appears to us unlikely (in the face of the chemical results) that it can enable the body to perform more work on less food, though by quickening a failing heart it may enable work to be done which otherwise could not be so. It may then act like the spur in the hide of the horse, eliciting force, though not supplying it." The experimenters, whilst recognizing further the great practical use of alcohol in raising a failing appetite, exciting a feeble heart, and accelerating a languid capillary circulation, are strongly impressed with the need of moderation and caution in its use. They do not deal with diseased conditions, but only a state of health, and do not refer at all to the action of wine or beer.

The Academy of Sciences at Paris will bestow this year a prize of 5000 francs for the best essay, "On the Use of Electricity in Medicine," and two prizes in botany, each of the value of 3000 francs.

Pencils of Sulphate of Copper.—M. Herbelin, of Nantes, rubs a crystal of sulphate of copper on a moist stone covered with fine sand, until a pencil is produced. —*Répertoire de Pharmacie.*

Parliamentary and Law Proceedings.

INDIAN DRUGS.

In the course of his speech upon introducing the Indian budget to the House of Commons last week, Mr. Grant Duff said that the revenue from opium had fallen off largely, but that, on the other hand, there had been an increase in the excise from spirits, drugs, etc., known as the Abkari revenue. Very frequent inquiries about the forest service were made at the India Office. The experiment they had been making of selecting young men by a competitive examination, and then giving them a thorough training in the great forest schools at Hanover and Nancy, bade fair to produce excellent results, and to give them a real forest school in India. That was all the more important because, although the natural products were not yet made anything like so available to mankind as they ought to be, the increased tendencies of all art and science in our times to produce specialities and encourage specialists were depriving them, to a great extent, of the assistance they used to receive in that field from various classes of their officers, and above all from their medical men. The examinations for the special Forest Service showed increasingly careful preparation. The accounts they received of the young men studying on the Continent were good, while those who were in India were thought likely to turn out very useful officers. Although the receipts had largely increased, there had also been a proportionate increase in the expense, but in a new service that was only what might be expected, and it might go on increasing for some time without raising any presumption against the ultimate pecuniary results of the plan. In fact, much more than mere pecuniary results were at stake: climatic changes of a very dangerous kind were threatening, or in some instances had actually occurred, and the evils that had to be met could only be checked by the direct action of the Central Government. The excellent results of the cinchona cultivation had been laid before the House. Peru and Ecuador had given increased facilities for combating fever, one of the worst enemies of man in India; they had already two millions and a half of cinchona plants growing there. It was now the turn of Brazil to enable them to combat acute dysentery, a hardly less formidable foe. Measures had been taken to send out from Kew, from Edinburgh, and also directly from Brazil, the ipecacuanha, which is now considered almost a specific against that terrible malady. Lately the Government of India had been devoting some attention to the Rhea or China grass, an abundant Indian product, which, if a machine could be obtained that would detach the fibre from the stalk in an easy and satisfactory manner, would become of great economic importance; rewards to the amount of £5000 had been offered by the Indian authorities for such a machine. The opening of the Suez canal seemed likely to exercise a favourable influence on the tea cultivation of Northern India. Turning to another very important Indian product, it was gratifying to observe that India last year sent nearly as much cotton to our shores as the United States and Brazil combined. There was satisfactory evidence that the cultivation of the poppy was spreading very extensively through China, although the old vigorous edicts against it remained unrepealed; but there was not satisfactory evidence as to how far that extended cultivation was the result of the withdrawal of much of the pressure that prevented the Chinaman from indulging in his favourite luxury, and of a consequent increase of consumption; or whether it implied that the Chinese opium was now used by many who formerly used the Indian opium. For anything yet known, Indian opium might still find a very profitable market in China. The estimated revenue from opium in 1870–1 was under seven millions, whereas in 1867–8 a smaller opium expenditure produced an opium revenue of nearly nine millions.

Mr. Eastwick said that one of the most prominent reasons for retrenchment was the precariousness of the opium trade. Sir Richard Temple, in his statements, merely spoke of the extension of opium cultivation in China, and entirely overlooked the exportation of opium from Persia. A few years ago that country did not export any opium; but last year it exported four thousand chests, worth about half a million sterling. It had been analysed and found to be nearly equal to the opium of India, whilst it had the further recommendation of paying no duty, so that the profit was enormous. He should not be surprised if that branch of the trade doubled or quadrupled in a year.

AN ACT TO REGULATE THE SALE OF POISONS IN IRELAND.

[*14th July*, 1870.]

Whereas it is expedient for the safety of the public that due provision should be made to regulate the sale of poisons in Ireland:

Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:

1. The several articles mentioned in the Schedule A. to this Act annexed shall be deemed to be poisons within the meaning of this Act; and the King and Queen's College of Physicians in Ireland may from time to time, by resolution, declare that any article other than those mentioned in the said schedule and in such resolution named ought to be deemed a poison within the meaning of this Act; and thereupon the said College shall submit the said resolution for the approval of her Majesty's Privy Council in Ireland, and if such approval shall be given, then such resolution and approval shall be advertised in the 'Dublin Gazette;' and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act.

2. It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article, and the word "poison," and with the name and address of the seller of the poison; and it shall be unlawful to sell any of the poisons which are named in the first part of Schedule A. to this Act annexed, or which may hereafter be added thereto under section one of this Act, to any person unknown to the seller, unless such person is introduced by some person known to the seller; and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating in the form set forth in the Schedule B. to this Act annexed, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person (if any) who introduced him shall be affixed; and any person selling poison otherwise than is herein provided shall be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence; and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller; but the provisions of this section which are solely applicable to poisons in the first part of the Schedule A. to this Act annexed, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from Ireland by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine

supplied by a duly qualified apothecary nor apply to any article when forming part of the ingredients of any medicine dispensed by a duly qualified apothecary, provided such medicine be labelled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered with the name of the person to whom it is sold or delivered in a book to be kept by the seller for that purpose; and nothing in this Act contained shall repeal or affect any of the provisions of the Act of the fourteenth and fifteenth years of the reign of her present Majesty, intituled "An Act to Regulate the Sale of Arsenic."

3. The provisions of the Act of the twenty-third and twenty-fourth years of the reign of her present Majesty, intituled "An Act for preventing the Adulteration of Articles of Food or Drink," shall extend to all articles usually taken or sold as medicines, and every adulteration of any such article shall be deemed an admixture injurious to health.

4. Every penalty recoverable under the provisions of this Act shall be recoverable in a summary way, with respect to the police district of Dublin metropolis subject and according to the provisions of any Act regulating the powers and duties of justices of the peace for such district or of the police of such district, and with respect to other parts of Ireland before a justice or justices of the peace sitting in petty sessions, subject and according to provisions of the Petty Sessions (Ireland) Act, 1851, and any Act amending the same, and shall be applied according to the provisions of the Fines Act (Ireland), 1851, or any Act amending the same.

SCHEDULE A.

Part I.

Arsenic, and its preparations.
Prussic acid.
Cyanides of potassium and all metallic cyanides.
Strychnine, and all poisonous vegetable alkaloids and their salts.
Aconite, and its preparations.
Emetic tartar.
Corrosive sublimate.
Cantharides.
Savin, and its oil.
Ergot of rye, and its preparations.

Part II.

Oxalic acid.
Chloroform.
Belladonna, and its preparations.
Essential oil of almonds, unless deprived of its prussic acid.
Opium, and all preparations of opium or of poppies.
Preparations of corrosive sublimate.
Preparations of morphine.
Red oxide of mercury (commonly known as red precipitate of mercury).
Ammoniated mercury (commonly known as white precipitate of mercury).
Every compound containing any of the poisons mentioned in this schedule, when prepared or sold for the destruction of vermin.
The tincture and all vesicating liquid preparations of cantharides.

SCHEDULE B.

Date.	Name of Purchaser.	Name and Quantity of Poison sold.	Purpose for which it is required.	Signature of Purchaser.	Signature of Person introducing Purchaser.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

ACIDUM NITRICUM.—[§ An acid, prepared from nitrate of potash or nitrate of soda, by distillation with sulphuric acid and water, and containing 70 per cent. by weight of nitric acid, HNO_3.] Specific gravity 1·42.

The reaction which occurs in the retort is similar to that in which hydrochloric acid is produced:—

$$KNO_3, \text{ or } NaNO_3 + H_2SO_4 = HNO_3 + KHSO_4, \text{ or } NaHSO_4.$$

Absolute nitric acid differs from hydrochloric acid in being, at ordinary temperatures, not a gas, but a fuming liquid of sp. gr. 1·51; this was the preparation of the B. P. 1864; it is, however, extremely unstable, undergoing decomposition spontaneously in the light, and in many respects inconvenient, and was, therefore, replaced in the present edition by a weaker acid. Nitric acid poured over copper filings evolves dense red fumes, consisting chiefly of nitric *per*oxide:—

$$4HNO_3 + Cu = Cu''2NO_3 + 2H_2O + 2NO_2.$$

If previously diluted with water, nitric oxide is the gas evolved:—

$$8HNO_3 + 3Cu = 3(Cu2NO_3) + 4H_2O + 2NO.$$

Nitric oxide is a colourless gas, but when it meets oxygen either alone or mixed with other gases, as in atmospheric air, it forms an orange-red vapour:—

$$\underset{\text{Nitric oxide.}}{2NO} + \underset{\text{Oxygen.}}{O_2} = \underset{\text{Nitric peroxide.}}{2NO_2}.$$

Nitric oxide forms, with ferrous sulphate, a dark-coloured solution, upon the formation of which depends the usual test for nitrates:—Dissolve the substance in water, add a small crystal of sulphate of iron, and shake up till partly dissolved, then pour into the inclined tube sufficient pure and strong sulphuric acid to form a separate stratum at the bottom. The line where the two liquids meet is marked by a purple or brown coloration if a nitrate (or nitrite) is present. Nitric acid is an example of what are known as *oxidizing agents;* it readily and freely gives up part of its oxygen. This arises from the strong affinity of the hydrogen in it, and the weaker affinity of the nitrogen for oxygen; so that when brought into contact with bodies greedy of oxygen, oxygen separates from it, water is formed, and one of the oxides of nitrogen. This is the reason of its deflagration when poured upon hot charcoal, the decolorization of indigo and other reactions, *e.g.* when nitrate of ammonia is strongly heated:—

$$NH_3.HNO_3 = \underset{\text{Water.}}{2H_2O} + \underset{\text{Nitrous oxide.}}{N_2O}.$$

Also its reactions with copper already described, and resulting in the evolution of nitric oxide and peroxide.

The sesquioxide of nitrogen, or nitrous anhydride, is evolved when it acts upon white arsenic:—

$$\underset{\text{Arsenious anhydride.}}{As_2O_3} + 2HNO_3 = \underset{\text{Arsenic anhydride.}}{As_2O_5} + H_2O + \underset{\text{Nitrous anhydride.}}{N_2O_3}.$$

The whole of the oxides of nitrogen are tabulated below:—

Nitrous oxide, or laughing gas . . . . . . N_2O
Colourless.

Nitric oxide (formerly binoxide of nitrogen) . . . . N_2O_2, or NO
Colourless, but reddens in the air.

Nitrous anhydride . . . . N_2O_3
Red fumes, condensible to blue liquid.

Nitric peroxide . . . . N_2O_4, or NO_2
Red-brown fumes, condensible to orange liquid or crystalline solid.

Nitric anhydride . . . . N_2O_5
Colourless, crystalline, easily decomposed.

The nitric acid of the B. P. should leave no residue on evaporation, showing that it contains no nitrate of potash or soda; and should give, *when considerably diluted*, no precipitate with chloride of barium or nitrate of silver, showing freedom from sulphuric and hydrochloric acids. It is necessary to add water, for the undiluted acid will throw down many salts, such as nitrate of barium, which are soluble in water, but not in the concentrated acid. 9 grams of nitric acid, B. P., are neutralized by the addition of 100 cubic centimetres of the volumetric solution of soda. 1000 c.c. of vol. sol. of soda contain 40 grams of $NaHO$, and will neutralize 1 molecule of HNO_3, or 63 grams. 100 will therefore neutralize $\frac{1}{10}$th of 63 or 6·3 grams. This is the amount of HNO_3 in 9 grams of the official acid; it is equivalent to 70 per cent.; for

9 : 6·3 :: 100 : 70.

The British Medical Association.—The Thirty-eighth Annual Congress of the British Medical Association was inaugurated yesterday by the usual preliminary proceedings of the Council, and more formally by the general meeting of the members in the Lecture Room of the Literary and Philosophical Society, on which occasion Dr. Charlton, of Newcastle, signalized his accession to the Presidency for the year by the delivery of an address almost equally interesting to the general public and to the medical profession, inasmuch as it was devoted to the great subject of Hygiene and to what may be called the politics of the profession. This latter subject elicited sympathetic response from the Association, which has already distinguished itself in the promotion of medical reform, while it is still leading the van against obsolete pretensions and the obstructiveness of vested interests. The address furnishes a convenient abstract of the aims, principles, and achievements of the Society to which Newcastle is this week extending its heartiest welcome and warmest hospitality.—*Newcastle Daily Chronicle.*

Accident at the A B C Sewage Works at Hastings.—The Hastings sewage works* have become the scene of a melancholy disaster. As in the case of the London main drainage, the sewage of Hastings is received into a large tank or reservoir, where it is stored until the state of the tide allows of its discharge. The Hastings Sewage Manure Company, who work what is termed the A B C patent, under an arrangement with the Native Guano Company, have established their works just over the spot where the great intercepting sewer discharges into the tank. The tank itself is of considerable extent, and is entirely subterranean, having an entrance or man-hole at each end. Late on Friday evening cries of distress were heard proceeding from the tank, into which two of the workmen were known to have descended. Mr. Porter, who acted as chemist to the manure company, was on the premises at the time, and unfortunately sacrificed his own life in an unsuccessful attempt to rescue them. He descended the shaft leading to the tank, and a man who accompanied him saw him fall.

An inquest was held, on Monday afternoon, on the bodies of the two workmen, when the jury returned a verdict of "Accidental death from inhaling noxious gases," but no evidence was produced to show how these gases were generated. A similar verdict was returned by another jury in the case of Mr. Porter, whose body was recovered later.

* See Pharm. Journ. No. 1, p. 5.

Blood Pictures.—Dr. Day, of Geelong, Australia, the improver of the guaiacum-tests for blood and other animal fluids, confirms the discovery of Neumann, that the picture or network formed by human blood can be distinguished under the microscope from that which is formed by the blood of other animals. He says he has repeated the experiment, which is "wonderfully simple," almost every day for the last two months, with invariable success. A small drop, not a mere speck, of the blood is to be placed on a microscopic slide, and carefully watched, at a temperature of 10° or 12° Réaumur (=54·2° to 59° Fahr.), until the picture or network formed by its coagulation is developed. Human blood speedily breaks up into a "small pattern" network; the blood of other animals (calves, pigs, etc.) takes a longer time, and makes a larger pattern; but the blood of every animal seems to form a characteristic "picture." Dr. Day has examined the blood of calves, pigs, sheep, rabbits, ducks, hens, several kinds of fishes, etc., as well as that of man, and has found the results to be trustworthy and constant.—*British Medical Journal.*

Arsenic.—The use of arsenic in a very large number of skin diseases has led to a conclusion that its specific effects upon such diseases have been greatly exaggerated. In a large number of selected cases no benefit has been apparent. As a tonic in neuralgia, rheumatism, and ague, it is an excellent remedy.—*Annual Report of the Hankow Medical Mission, by F. Porter Smith, M.B.*

Obituary.

The death, at the age of 75, of Baron Charles von Hügel is announced. He was Austrian plenipotentiary at the Court of Belgium, and well known as an Austrian explorer and founder of the Horticultural Society at Vienna. He died at Brussels on the 2nd of June. Baron von Hügel was author of 'Botanisches Archiv der Gartenbaugesellschaft des Oesterreichischen Kaiserstaates,' Wien, 1837; and of 'Orchideensammlung im Frühjahr 1845,' Wien, 1845, which enumerates 1080 species. Some of the plants collected by him in Australia in 1833 were enumerated, and the new species described by Bentham, Fenzl, Schott, and Endlicher, in the unfinished 'Enumeratio Plantarum quas in Nov. Holl. collegit C. L. B. de Hügel,' Vienna, 1837.

BOOKS RECEIVED.

Observations on Therapeutics and Disease. By Donald Campbell Black, M.D., L.R.C.S. Edinburgh. London: John Churchill and Sons. Glasgow: James Hadden. 1870.

The Food Journal. No. VII. London: J. M. Johnson and Sons, 3, Castle Street, Holborn.

The Practice of Perfumery: a Treatise on the Toilet and Cosmetic Arts, Historical, Scientific, and Practical; with Chapters on the Management of the Hair, Skin, and Teeth. By R. Jones Owen. London: Houlston and Sons.

The Laboratory Guide: a Manual of Practical Chemistry for Colleges and Schools, specially arranged for Agricultural Students. By Arthur Herbert Church, M.A. London: Van Voorst.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

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

Trade Grievances.

Sir,—In the admirable letter of "A Country M. P. S." on the above-mentioned subject two suggestions are given, and, so far, very good; but I think that there might have been a third, which is, "that all Registered Chemists and Druggists be equally exempt with Pharmaceutical Chemists from serving on juries;" or, what would be better, "that all who are M. P. S. or A. P. S. be exempt."

If the latter suggestion became law, every chemist in the country would become connected with the Society, just the same as every surgeon is a member of his college.

Again, I do not see why the Pharmaceutical Society should not be called the Royal College of Pharmacy, and so Members become entitled to the initials M.R.C.Ph., and Associates A.R.C.Ph. The difference between Pharmaceutical Chemists and Chemists and Druggists would be much the same as it is between the Fellows (F.R.C.S.) and Members (M.R.C.S.) of the College of Surgeons.

I remain, Sir, yours obediently,
W. B. C.

Manchester, August 8th, 1870.

Sir,—It was with some surprise that I read in the Journal of the 6th an article written, under the title of "Trade Grievances," by an M.P.S. The writer of this letter, I think, must have been in a somewhat passionate frame of mind, or he would hardly have recommended the adoption of the sixth article of the French code to our English law. It is well that the desire of the Pharmaceutical Society for educational progress has not led it to wish to take from shopkeepers the right of selling simple drugs, as salts, senna, etc. In not attempting this, the Society has shown that whilst in restricting the sale of poisons it has been anxious to protect the public welfare, yet it has not wished to prohibit the sale of simple remedies merely to enrich the class of tradespeople whom it represents. In stigmatizing small shopkeepers who deal in the above class of drugs as pirates, parasites, etc., I think our friend has far exceeded the bounds by which he would have been restrained, had he considered justice, good taste, and courtesy.

Although wishing as ardently as "A Country M.P.S." that the sale of drugs should be confined to our class, yet it is not by the aid of the law that I would see this done, but by the gradual enlightenment of the public mind, which will lead people to see the propriety of purchasing even the simpler drugs from an educated tradesman.

In conclusion, I would just remark that, should any Act so stringent as the one advised be passed, in all common English fairness, grocers and wine merchants will demand that we, too, be compelled to leave off the sale of the many articles which belong especially to their department.

I am, Sir, yours truly,
Walter B. Clarke, A.P.S.

15, *Belvoir Street, Leicester.*

Sir,—"A Country M. P. S." should not worry himself about his "grocer" neighbours who sell salts and senna, unless prepared for fair play, for I should be glad to "spot" the small town pharmacist who does not sell tea, spices, starch, and the numerous articles fairly within the province of the grocery trade. The French pharmaciens are undoubtedly blessed by having Art. 6 to protect them; but no free-trading Englishman can be debarred from selling "that which goeth into the mouth," though it steal away the brain. "M. P. S." has but a poor opinion of himself if he fears the competition of shopkeepers who can only sell scheduled poisons by affixing a patent medicine stamp thereon; so much for the Pharmacy Act and the five-shilling patent medicine licence. We note, on *paper,* the advancing strides of chemistry, and the superior position of pharmacists, whilst it is well known that grocers who *have sold* drugs are now "registered chemists;" time, of course, will settle the many sham druggists now afloat, but until the present generation die off, or this grievance is looked after, the existing state of things must continue. Of course, the well-educated pharmacist will, as a rule, carry more weight with the public than will a second-class man, but it must not be forgotten that "birds of a feather" will sympathize with each other, and No. 2 frequently drives ahead of No. 1, whose pride, as a superior and scientific man, brings him to beggary, especially in small country places.

Just a word about "Rule of Thumb," or guessing, there is more "cry than wool" about your correspondents' letters, for who would weigh out separately a dozen 1 grain calomel powders, or not do so in the case of the same number of ʒij magnesia powders? A practical man will judge correctly, and never be in doubt as to the best method of dispensing physic.

Just another word. I am a country pharmacist, and to make a fair return am *obliged,* by the necessities of "small mouths to be filled," not to do as I would wish, but to provide my *clientèle* with the minor articles of grocery, and encroach also upon the preserves of the painter, perfumer, butcher, wine merchant, etc. etc., without squeamishness, thankfully and cheerfully.

I am, Sir, faithfully yours,
J. Houlton.

Poison Regulations.

Sir,—I regret to find that the "Poisons Regulations" are rising to the surface again; I had hoped they were submerged with a millstone upon them.

Notwithstanding the suggestion of the 'Pall Mall Gazette,' that our Society has public duties and private interests, which may not always concur, it so happens with chemists that public duty and private interest do absolutely concur; for a chemist's success mainly depends upon public appreciation, and that depends upon the care and attention of the individual, the public having quick discernment in these matters.

Your obedient servant,
John Beaton.

Kilburn, August 8th, 1870.

W. C. Fry (Taunton).—The work mentioned is a very good one for the purpose.

"*Studiosus*" (Knaresborough) writes to ask which is the best modern work on the general treatment of diseases in cattle and horses, and its price.

A. B.—(1.) The tap would be injured after a time. (2.) The solution would probably become contaminated by the metal.

W. Young (Harrow Road).—Received with thanks.

C. L. R. wishes to be informed where he can procure a work on entomology, in which "the general structure of insects is fully explained, and the conformation of their minute parts as seen in the microscope is adequately illustrated."

"*Zeta*" and "*Quercus.*"—The new edition of Bentley's 'Manual of Botany' will be ready in October.

"*Cortex*" (Manchester).—(1.) Scheele's green comes within the meaning of the Act. (2.) Apply for information to the Registrar.

G. J. Thomas (South Molton) should consult his solicitor.

"*Chemist*" should apply to the Inland Revenue Office.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

The General Index to the first Fifteen volumes of this Journal may be obtained of the Secretary, 17, Bloomsbury Square, price 2*s.* 8*d.*, post free; bound in cloth, lettered, 3*s.* 8*d.*, post free.

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ACETIC FERMENTATION.

BY BARON VON LIEBIG.

(*Continued from p.* 124.)

The various decompositions of organic substances may, as I believe, be grouped in three distinct classes.

The first class comprises those forms of fermentation which give rise to alcohol, lactic acid, or butyric acid, and the putrefaction of animal materials. These processes, once commenced, continue to go on without further aid by atmospheric oxygen.

The second class comprises acetic fermentation, nitrification, also the fermentation of urine. Here atmospheric oxygen plays a definitely determining part.

The peculiarity in the fermentation of urine, or one form of it, was first observed by Gay-Lussac. He found that fresh urine might be kept for months without decomposition in a clean glass vessel entirely filled, but if the vessel was half-filled with air, oxygen was absorbed by the urine, and a corresponding quantity of urea was converted into carbonic acid and ammonia. This decomposition was limited by the quantity of oxygen, and it commenced again when fresh oxygen was supplied until eventually all the urea was transformed.

This decomposition of the urea is accompanied by an oxidation of the colour constituents of the urine, and a small quantity of acetic acid is formed at the same time.

The special peculiarity of this fermentation is that two processes take place together, an oxidation and a breaking up; while one or more constituents of the urine are being oxidized they act, by virtue of that change, like a ferment such as beer-yeast upon cane sugar; urea associated with the elements of water breaks up as sugar does, without otherwise taking part in the oxidation. Fermentation of this kind takes place also in animal materials when access of air is not prevented during their putrefaction.

The fermentation of dextrin in beer-wort presents a phenomenon entirely similar.

In the course of a long series of experiments that have been conducted in my laboratory by Dr. Lermer, I have had an opportunity of confirming the observations of Musculus, that by the action of diastase, starch is only partially converted into sugar.

In mashing malted barley the starch is acted upon by a large excess of diastase; but at the utmost the sugar produced corresponds only to one-half of the starch present. A sample of malt which gave 74 per cent. of sugar when heated for twelve hours with dilute hydrochloric acid, yielded only 34 per cent. of sugar when mashed until the iodine reaction was no longer produced. A solution of dextrin does not undergo fermentation when mixed with beer-yeast; but when some sugar is added to the mixture, great part of the dextrin is converted into alcohol and carbonic acid just as the sugar itself is.*

In this case the influence of the motion communicated to the sugar atoms by the action of yeast appears very evidently to have been extended to the dextrin, upon which yeast has no action. Before the dextrin could break up into alcohol and carbonic acid, it must have been converted into sugar.*

Excepting beer-yeast and the vinegar plant, which can easily be collected in quantities and purified, the other ferments are scarcely known in regard to their chemical relations; but it is to be hoped that by more thorough investigation their peculiarities and their influence in the production of lactic acid, butyric acid, etc., may become explicable in the same way as the decomposition of sugar in vinous fermentation, or the production of acetic acid by *Mycoderma aceti*.

If chemical causes determine the action of yeast-cells in vinous fermentation, it might be expected that external chemical actions would exercise some influence on the progress of the fermentation. There are, indeed, many observations as to the influence of chemical agents upon the fermentation of sugar, and though some of the results I have obtained were already known, the confirmation of previous statements is of some interest.

A trace of oxide of mercury entirely stops the action of yeast upon sugar,† and it acts in the same way upon yeast-water. If this is mixed with a little of the freshly precipitated oxide, then filtered, and mixed with some solution of cane sugar, it will be found that no grape sugar is formed.

Salts of copper exercise the same influence upon fermentescible mixtures. The yeast takes up the copper salt and becomes green. In that state it has no action on sugar.

Persalts of iron colour yeast dirty yellow; after two or three days this colour disappears and then a slow regular fermentation sets in.

In order to avoid repetition, it may be stated that in the following experiments the mixtures operated upon contained in each instance 5 grm. of sugar with the same quantity of washed yeast, and that, with all additions included, the total volume was always 100 c.c. To some of these mixtures were added various substances, in order to ascertain their influence on the fermentation; one had no admixture, and that served as a standard for comparison.

When the fermentation took place unequally in these mixtures within a given time and under the same conditions, that could be readily ascertained by determining the quantity of sugar remaining at the end of the experiments; if, for example, there was less sugar in the standard mixture that had received no admixture than there was in others, it is evident that the fermentation must have been retarded in the latter cases.

The sugar determinations were generally made by Fehling's method, or by a new method which gives very accurate results, and in which cyanide of mercury is used.

The chlorides of sodium and potassium appear to promote fermentation somewhat. In mixtures containing these salts there was about 5·5 per cent.

* 300 c.c. of a mash containing 8·449 grm. of sugar was mixed with 10 per cent. of yeast and left to ferment at 18° C. After the lapse of six days all the sugar had disappeared; the alcohol then contained in the liquid was ascertained to be 6·942 grm. According to the amount of sugar, it should have been only 4·317 grm.

* After fermenting 385 c.c. of beer-wort containing 22·86 grm. of sugar, it was found to contain 18 grm. of alcohol, but according to the quantity of sugar it contained, only 11·683 grm. should have been formed. The excess of alcohol in this and the preceding experiment can only have originated from dextrin. The quantity of dextrin decomposed in fermentation appears also to be very much dependent upon the temperature of the wort during fermentation. 500 c.c. of the same wort fermented at 8° C. gave 13·897 grm. alcohol; while according to the quantity of sugar in the wort, 14·37 grm. of alcohol might have been formed.

† Colin.

more sugar decomposed within sixteen hours than in the standard mixture.

Caustic potash, soda and ammonia, added to the mixture in such quantity as to render the liquid strongly alkaline, did not hinder fermentation; but a much longer time elapsed before the evolution of gas became evident, since the carbonic acid was taken up by the alkalies until bicarbonates had been formed.

Fermentation is remarkably retarded by chloroform. After adding 30 c.c. of a clear, filtered solution of chloroform in warm water, several mixtures were left to ferment for fifteen or eighteen hours, with the following results as regards the sugar decomposed:—

	I.	II.	III.
Mixtures with chloroform	0·240	1·240	4·00 grm.
„ without „	1·670	2·230	4·34

The mixture I. was tested for sugar eighteen hours after fermentation, II. fifteen hours after, and III. forty hours after.

Against 100 parts sugar decomposed in the standard mixtures, there was in I. only 14 per cent. decomposed, within the same time, where chloroform was present; in II. there was only 55 per cent. decomposed.

As chloroform is very sparingly soluble in water, if it may be assumed that the solution contained its own volume of chloroform vapour, it would only amount to one-third of the volume of the mixtures, so that the action of chloroform may be regarded as very powerful. A few drops of chloroform added to one of the mixtures, stopped the fermentation completely.

My experiments as to the influence of quinine upon fermentation are confirmatory of the results obtained by Dr. Kerner and others. Small quantities retard, while larger quantities entirely stop fermentation. With an addition of 0·2 grm. sulphate of quinine, the mixture contained 4·75 grm. sugar after forty-eight hours, while in the standard mixture the whole of the 5 grm. had been decomposed.

In neutral solutions nicotine appears to accelerate fermentation somewhat. With an addition of 0·5 grm. hydrochlorate of nicotine, the sugar decomposed after fourteen hours was as 11 : 10 in the standard mixture, so that one-tenth of the sugar remained in the unmixed solution of sugar; after thirty-six hours the quantities of decomposed sugar were as 29·5 : 26·5, or in the same ratio as before. Therefore in both instances the acceleration was apparently the same.

The influence of strychnine is peculiar. On addition of small quantities, fermentation is at first accelerated, then it is retarded. The mixtures containing strychnine evolve much more gas during the first six hours than the standard does; they froth considerably more and readily rise over the top of the vessel.

In two mixtures, containing respectively 0·01 grm. and 0·1 grm. hydrochlorate of strychnine, the quantities of sugar decomposed within four hours were to the quantity decomposed in the standard as 15 : 14 : 13; after eighteen hours they were as 24 : 24 : 25·7, so that it would seem there was acceleration during the first four hours and a retardation subsequently.

This retardation is more recognizable when the addition of strychnine is increased. On adding 0·2 grm. of the salt, there were decomposed in two mixtures—

With strychnine . . .	3·09 grm. sugar.	
Without „ . . .	3·68	„

Creatin appears to retard fermentation, while creatinine appears to accelerate it, and at the same time the creatine is partially converted into creatinine.

An exceedingly minute quantity of prussic acid suffices to retard fermentation and to stop it altogether. In a mixture containing 0·018 grm. dry acid, the quantity of sugar decomposed within sixteen hours was only 0·6 grm., while on the standard there was 3·4 grm. decomposed, or six times as much. With a large quantity of prussic acid there was no fermentation.

The action of the organic substance in yeast-water upon cane sugar is not hindered by prussic acid. When yeast-water, mixed with a few drops of the acid and a solution of cane sugar, is left for some hours, a certain quantity of grape sugar is found to have been formed. On saturating the liquid with oxide of mercury, filtering, and heating the filtered liquid after addition of caustic soda, a grey precipitate of metallic mercury is produced. It is only grape sugar that has this property of reducing an alkaline solution of cyanide of mercury.

However, prussic acid has a remarkable influence upon yeast-water: it has already been mentioned that yeast-water left in contact with the air becomes turbid and deposits a white sediment. Frequently there is also a layer of mould formed on the surface. This alteration appears to be entirely prevented by prussic acid. Yeast-water mixed with a mere trace of prussic acid remains for weeks perfectly clear; there is no sediment formed nor any appearance of moulding.

Schönbein has already noticed the retardation caused by prussic acid, and one of its most remarkable features is that the capability of yeast to produce fermentation is not destroyed. Yeast that has been kept for some long time in contact with tolerably strong prussic acid was found, after washing out the acid, to produce perfectly normal fermentation in sugar solution.

It appears, therefore, that prussic acid does not effect any decomposition of the cell contents, nor enter into any permanent combination with any of its constituents, but that its presence suffices to suspend the molecular motion taking place in the cells just in the same way that a weak solution of carbolic acid or of creasote does.

When yeast is brought in contact with solution of peroxide of hydrogen, a copious evolution of oxygen takes place, as pointed out by Schlossberger; but if the yeast be mixed with some prussic acid beforehand, there is no decomposition of the peroxide of hydrogen and no evolution of gas.

This phenomenon calls to mind the remarkable observations of Schönbein as to the action of prussic acid on blood-pigment and materials susceptible of putrefaction. He found that when fresh blood is mixed with a solution of peroxide of hydrogen, the equilibrium of this unstable compound is so much disturbed that its constituents rapidly break up into water and oxygen gas. However, the admixture of a very minute quantity of prussic acid entirely neutralized the decomposing influence of the red pigment on the peroxide, and the mixture then became dark blackish-brown.

It is well known that pure colourless blood serum, of the same degree of concentration as in blood, may be left for weeks in contact with the air, and that it will not putrefy; while defibrinated blood, on the mixture of blood serum with the corpuscles of the blood, rapidly passes into a state of putrid fermentation. In this case the blood-pigment appears to act upon the albumen of the blood just in the same way as yeast acts on sugar. An addition of a thousandth part of prussic acid to blood is sufficient to suppress putrefaction for a long time, just the same as it prevents the fermentation of sugar.

Neither strychnine, quinine, pyrogallic acid, nor oxide of mercury prevents the action of blood-pigment upon peroxide of hydrogen, neither does chloroform nor hydrate of chloral. Blood diluted with water is rendered sensibly paler-coloured by chloroform, while, on the contrary, the colour is darkened by hydrate of chloral, even in a slightly acid solution.

Thénard observed that well-washed white blood fibrine, when mixed with peroxide of hydrogen, produces the same effect as Schönbein observed with blood-pigment; the threads of fibrine immersed in a solution of the peroxide become covered with gas bubbles. However, if the fibrine be moistened beforehand with a few drops of prussic acid, and left for an hour before being immersed in the solution of peroxide, there is then no evolution of gas caused.

In the behaviour of yeast-cells towards chemical agents, such as strychnine, chloroform, quinine, and prussic acid, there seems to be some analogy with the influence exercised by some medicines upon certain parts of the living animal body, and from this point of view it may be of interest.

In regard to yeast as a plant-cell, it is remarkable enough that it has a chemical composition nearly the same as that of animal structures; the chief difference is, that the cell-membrane of the yeast-cell consists of a non-nitrogenous material. The mineral constituents are the same in both cases, and in the large amount of potash and phosphoric acid present analogy with those of muscle; moreover, the products of the putrefaction of yeast-cells are scarcely different from those afforded by animal materials.

It is to be assumed that in the living cell in the animal organism, there is incessant transformation or metamorphosis just as in yeast-cell; also, that the action of many medicines upon the living body, such as quinine, chloroform, prussic acid, etc., depends essentially upon the influence exercised by them upon the normal state of metamorphosis upon their altering the condition and normal functions of the nerves. Some chemical agents, such as sulphuretted hydrogen and pyrogallic acid, act in a purely chemical manner upon the blood; but the action of quinine, of prussic acid, or of strychnine is not so simple, and it does not admit of explanation simply by chemical alterations.

The liver and some glands may be compared to a system of yeast-cells in which, during its construction out of the constituents of the blood, peculiar compounds are formed that constitute the contents of the cells—compounds that have only a temporary existence, that exercise a special action upon the blood and its constituents (inasmuch as their constituents separate or arrange themselves differently)—just as the yeast-cells act upon beer-wort, and while decomposing its sugar, constantly reproduce themselves.

The observation recently made by Schmulewitsch, under the guidance of Ludwig, that the liver of a freshly-killed rabbit continues to secrete bile for several hours when defibrinated dog's blood is passed through it, is, in this respect, of the greatest significance, and so is the formation of sugar in the liver observed by Bernard to take place even when the food consists exclusively of flesh.

The fact that a fresh calf's liver cut into pieces, and kept in water at 30° to 40° C., begins after four or six hours to evolve pure hydrogen gas without giving off the slightest smell, is, I believe, indicative of a powerful process of metamorphosis going on in the liver. Considering the part played in digestion by one of the organic substances contained in the gastric secretion; considering also the peculiarities of the saliva and of the pancreatic secretion, it is scarcely possible to avoid the conclusion that a number of processes in the animal organism are dependent on the same causes that give yeast its remarkable influence.

ON MEDICINAL PEPSIN.*

BY RICHARD V. TUSON, F.C.S.,

Professor of Chemistry at the Royal Veterinary College.

Since the introduction into medicine of Corvisart and Boudault's "poudre nutrimentive" in the year 1854, pepsin obtained from the stomach of the pig,† calf, or sheep, in a state of greater or less impurity, has been extensively prescribed in dyspepsia and certain other affections. According to the testimony of some authorities of high standing, long experience in the use of this agent fully justifies the predictions relative to its therapeutic value, which were put forward by Corvisart as based upon physiological reasoning. However, there are other authorities, equally eminent, who either express doubts as to the efficacy of pepsin, or positively state that it is totally devoid of medicinal power. In all probability this difference of opinion mainly arises from the circumstance that pharmaceutists supply medical men with various preparations; all bearing the same specific name of pepsin, but differing very considerably in their digestive powers and other qualities. In fact, so far as I have at present been able to collect evidence relative to the merits and demerits of pepsin, I find those who speak favourably of its employment in the treatment of disease have prescribed that prepared by the best makers; while those who express a doubtful or adverse opinion respecting its value have been in the habit of prescribing those varieties or makes which the experiments of myself and others have proved to be practically without any digestive activity whatever. The relative digesting capability of several samples of English and Continental pepsin was investigated by Dr. Sieveking‡ in 1857 and a similar inquiry was conducted by Dr. Pavy§ in 1863. The results of the experiments of both gentlemen indicated that there was not merely a difference in the qualities of the pepsin prepared by different makers, but that—as was particularly shown by Dr. Pavy—some of the samples examined were totally incapable of digesting muscular tissue. One would have thought that the publicity given to these facts in the medical journals would have caused the prescription of none but the best makes of pepsin; that it would also have induced those who had hitherto fabricated an inferior article either to have abandoned its manufacture, or to have improved the methods they employed for its preparation. Such, however, was not the case, for pharmaceutists at the present date continue to vend, while

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* From the 'Lancet,' August 13, 1870.

† First brought into notice by Dr. Beale.

‡ 'Medical Times and Gazette,' 1857, vol. i. p. 336.

§ The 'Lancet,' April 25th, 1863.

medical men continue to prescribe, both the good and the bad qualities of pepsin. Only a few days ago an old-established and well-known wholesale druggist told me that a customer applied to him for two ounces of pepsin. He asked the customer whose make he required. The reply was, "the cheapest." On examining the kind of pepsin supplied on this occasion, it was found to be absolutely worthless as regards its power of digestion. Nevertheless it will be used medicinally and if the patient derives no apparent benefit from its administration, the practitioner who prescribed it may be induced to condemn pepsin *in toto;* or, should the patient soon get better, the improvement will in all likelihood be attributed to a preparation which is perfectly inert. In the first case, injustice would be done to a medicine which is said by many eminent practitioners to possess great therapeutic value when properly prepared; while in the second case, a worthless preparation would receive credit for performing a service it is totally incapable of rendering.

Being about to conduct some investigations on artificial digestion and requiring for my purpose considerable quantities of medicinal pepsin, possessing the highest digestive energy, I purchased, in March last, samples of the principal English makers; also some French samples, and one of a German maker. These were examined in the manner hereafter described. The results arrived at corroborate substantially those obtained by Dr. Pavy seven years ago, although the methods of investigation adopted by that gentleman and myself differ.* The following account of them may induce those who are in doubt as to the value of pepsin as a therapeutic agent to reinvestigate the medicinal action of an agent which, according to theory, ought to render good service in cases where the secretion of gastric juice is either deficient in quantity or defective in quality.

Ten samples of pepsin, obtained from different sources, were examined. The preparations of the several makers are distinguished from one another by letters in the following manner:—

A, A1 } Same make, but purchased at different houses.
B, B1 } Ditto, ditto.
C, C1, C2 } Ditto, ditto.
D
E
F.

EXPERIMENTS UPON ALBUMEN.

Fresh eggs were kept in boiling water for an hour and then allowed to get quite cold. After depriving them of their shells, the whites were cut into the thinnest possible slices,† great care being taken to reject any portions of yelk, as well as all slices of white of unequal thickness. A weighed portion of coagulated albumen thus prepared was placed in a two-ounce wide-mouthed bottle, covered with distilled water containing 1 per cent. by volume of concentrated hydrochloric acid.‡ These operations were conducted during the latter part of the day. Next morning the required amount of pepsin was weighed out and added to the mixture of albumen and dilute hydrochloric acid. The bottle and its contents were then placed in a water bath and kept at a temperature of 38° C. (100·4° F.). Digestion was regarded as complete when, at the end of four hours, particles of albumen could no longer be seen, and when the insoluble residue consisted of a very minute quantity of fibrous or membranous matters only. These observations were easily made, except in the experiments upon samples of pepsin containing large quantities of starch. In such cases, when digestion appeared to be finished, the result was not recorded until the contents of the bottle had been carefully elutriated, or strained through fine muslin, so that it might be ascertained with certainty, by the appearance of the residue in the bottle or on the filter (muslin), whether or not the whole of the albumen had been dissolved.

In the first series of experiments upon albumen, 5 grammes of coagulated egg-albumen and 25 cubic centimetres of distilled water, containing 1 per cent. of hydrochloric acid, were employed. The quantities of pepsin used are stated in the subjoined table, which is intended to show the relative amounts of the different makers (A, B, C, D, E, F) required to digest the same quantity of albumen in four hours. Two comparative experiments were in every instance set going at the same time.

Table showing Results of First Series of Experiments on Albumen (*25 cubic centimetres of acidulated water*).

Weight of Pepsin employed.	MAKE OF PEPSIN.					
	A.	B.	C.	D.	E.	F.
Grammes.						
0·050	Digested.	Not digested	Not digested	Not digested	Not digested	Not digested
0·075	...	ditto	ditto	ditto	ditto	ditto
0·100	...	ditto	ditto	ditto	ditto	ditto
0·150	...	ditto	ditto	ditto	ditto	ditto
0·175	...	ditto	ditto	ditto	ditto	ditto
0·200	...	ditto	ditto	ditto	ditto	ditto
0·250	...	ditto	ditto	ditto	ditto	ditto
0·300	...	ditto	ditto	ditto	ditto	ditto
0·400	...	ditto	ditto	ditto	ditto	ditto
0·500	...	digested	ditto	ditto	ditto	ditto
1·000	...	...	ditto	ditto	ditto	ditto
1·500	...	...	ditto*	ditto	ditto	ditto
2·000	...	...	...	ditto	ditto	ditto
3·000	...	...	...	ditto	ditto	ditto
4·000	...	...	...	ditto	ditto	ditto
5·000	...	...	...	ditto	ditto	ditto

It having been found impossible to continue the experiments on make C, with more than 1·5 gramme of pepsin, in consequence of the inability of 25 cubic centimetres of acidulated water to keep the mixture in a sufficiently liquid state, a second series of experiments were commenced, in which 50 instead of 25 cubic centimetres of diluted acid was employed. The weight of albumen used was the same as that in the first series, viz. 5 grammes.

Table showing Results of Second Series of Experiments upon Albumen (*50 cubic centimetres of acidulated water*).

Weight of Pepsin employed.	MAKE OF PEPSIN.					
	A.	B.	C.	D.	E.	F.
Grammes.						
0·050	Digested.	Not digested	Not digested	Not digested	Not digested	Not digested
0·250	...	ditto	ditto	ditto	ditto	ditto
0·300	...	ditto	ditto	ditto	ditto	ditto
0·400	...	ditto	ditto	ditto	ditto	ditto
0·500	...	digested	ditto	ditto	ditto	ditto
1·000	...	...	ditto	ditto	ditto	ditto
1·250	...	...	digested	ditto	ditto	ditto
5·000	...	...	...	ditto	ditto	ditto

* Experiments with this make of pepsin were here discontinued, in consequence of the 25 grammes of acidulated water employed being insufficient to maintain the requisite fluidity of the mixture.

* Dr. Pavy noticed the relative solvent action on frogs' legs of mixtures of pepsin and dilute acid.

† It is easier to observe the progress of the digestion of albumen if it be sliced than if it be minced.

‡ This degree of dilution was adopted from the circumstance that the results of special experiments indicated that it was more favourable to digestion than an acid of greater or less strength. It was also ascertained that water containing five per cent. of hydrochloric acid appeared to prevent completely the digestive process taking place. Is it, therefore, wise to administer acids along with or immediately after pepsin, in cases in where the stomach already contains an excessive quantity of acid?

From the results of the experiments detailed in the foregoing tables, it will be seen—

1st. That, in order to effect the digestion of a given weight of albumen, very different quantities of the pepsin prepared by makers A, B, C are required.

2nd. That, taking the digestive power of C as unity, the digestive ratios of A, B, and C are as follows:—

C = 1 (1·25 gramme dissolves 5 grammes of albumen.)
B = 2·5 (0·50 „ „ „ „)
A = 25 (0·05 „ „ „ „)

In other words, A is ten times as strong as B, and twenty-five times as strong as C.

3rd. That, inasmuch as coagulated albumen mixed with acidulated water and equal weights of D, E, and F did not give the slightest indication of being digested, even at the expiration of twenty-four hours from the commencement of the experiment, it is evident that such samples of pepsin are, to say the least, practically destitute of the power of digestion. A 1, B 1, C 1, and C 2 were tested in precisely the same manner as the other samples; it was found that their digestive powers did not materially differ from the corresponding samples A, B, and C, which, it will be remembered, were prepared by the same makers, but obtained from different sources.

The evidence afforded by the results of the experiments already referred to, will doubtless be considered quite sufficient to prove the existence of a wide difference in the digestive energy of certain samples of pepsin met with in pharmacy, and the utter worthlessness of others. Nevertheless, the following series of experiments upon fibrin was undertaken for the purpose of ascertaining whether or not the results would accord with those obtained in the previous investigations upon albumen.

EXPERIMENTS UPON FIBRIN.

In these experiments 5 grammes of finely-minced fibrin (lean of rumpsteak) was mixed with 50 cubic centimetres of distilled water containing 1 per cent. by volume of concentrated hydrochloric acid, and the quantities of pepsin stated in the following table. Temp. 38° C. (100·4° F.); duration of experiment, four hours. Two comparative experiments were invariably set going at the same time. When, in consequence of the presence of starch, the progress of digestion could not be satisfactorily watched, the mixture was strained through fine muslin for the purpose previously named when describing the mode of experimenting with albumen.

Table showing Results of Experiments upon Fibrin.

Weight of Pepsin employed.	MAKE OF PEPSIN.					
	A.	B.	C.	D.	E.	F.
Grammes.						
0·45	Digested.	Not digested	Not digested	Not digested	Not digested	Not digested
1·00	...	ditto	ditto	ditto	ditto	ditto
1·50	...	ditto	ditto	ditto	ditto	ditto
2·00	...	ditto	ditto	ditto	ditto	ditto
3·00	...	ditto	ditto	ditto	ditto	ditto
4·00	...	ditto	ditto	ditto	ditto	ditto
5·00	...	...	ditto	ditto	ditto	ditto

We are now enabled to see—

1st. That the relative digestive power of A and B on fibrin was very nearly the same as with albumen, the ratios being

10 A to 1 B with albumen;
8·88 (in round numbers 9) A to 1 B with fibrin.

2nd. That inasmuch as 5 grammes of fibrin was undigested by equal weights of pepsins C, D, E, and F, these preparations are practically destitute of medicinal value.*

Having shown, from the results of nearly three hundred experiments upon albumen and fibrin, that the pepsin distinguished by the letter A is far superior in quality to that of any other make, it appears to me simply an act of duty to the medical profession and of justice to the undermentioned firm, to state that it is prepared by Messrs. Bullock and Reynolds, of Hanover Street, Hanover Square.* In conclusion, I beg to thank my very able assistant, Mr. E. Lapper, for the aid he has rendered me during the prosecution of this inquiry.

* The fibrin remained undigested even at the end of twenty-four hours from the commencement of these experiments.

HYDRATE OF CHLORAL.

In one of a series of articles on the "Progress of Therapeutical Science," the 'Medical Times and Gazette' mentions that some years ago the late Sir J. Y. Simpson predicted† that among the organic compounds constantly being discovered by chemists some one would be found "as important as that most useful of all drugs—opium—and yet without either its constipating effects, or indirect tendency to excite subsequent nausea." Such a substance was found before his death in hydrate of chloral. From the same article we take the following particulars:—

Chloral itself was discovered by Liebig, in 1832; subsequently it was further examined by Dumas, but up to last year it remained a substance of merely chemical interest. Though itself a thin, colourless oil, clearer than water, greasy to the touch, possessing a peculiar pungent odour, and exciting a copious flow of tears, it forms with water a solid crystalline compound; and, as shown by Liebreich, of Berlin, this compound possesses great power as a hypnotic and anæsthetic. The hydrate of chloral contains 89·02 per cent. of chloral and 10·88 water. It dissolves freely in water, a saturated solution containing about 50 per cent. When pure, its diluted solution has a rather agreeable taste, a point of no small importance in its favour.

Dr. Richardson has characterized Liebreich's discovery of the medicinal virtues of chloral hydrate as a brilliant illustration of modern advance in therapeutics, inasmuch as it was arrived at by a determination of the action of a substance theoretically from a precise knowledge of its chemical and physical properties. Hydrate of chloral reacts with an alkali in such a manner that they are resolved into chloroform and a formiate. The blood being an alkaline liquid, Liebreich inferred that it ought therefore to produce this change, and that if chloral hydrate were introduced into the animal organism, "every small particle of it would consume the surrounding alkali, the decomposition being completed only after the requisite quantity of alkali had been furnished by the blood within an infinitesimal period; a minimum quantity of chloroform would thus be formed and passed to its first place of action, viz. the ganglia cells of the cerebrum." On account of the slight alkalinity of the blood, formation of chloroform would not take place explosively, as it were, but gradually and slowly, its own peculiar action would therefore also be exercised gradually and slowly on the ganglia of the cord, and lastly on the heart.

Liebreich first experimented with the substance on animals, and finding his anticipations realized, then extended his observations to man. His results were communicated to the Academy of Sciences in Paris during 1869, and he has since published a valuable pamphlet on the properties of chloral hydrate.‡ Last August, during the meeting of the British Association at Exeter, speci-

* Dr. Pavy also showed in 1863 that the pepsin of Messrs. Bullock and Reynolds was much more active than that of any other maker.

† 'Physicians and Physic,' 1856, p. 100; 'Monthly Journal of Medical Science,' vol. xvi. p. 359.

‡ 'Das Chloral Hydrat, ein neues Hypnoticum und Anästhesien,' etc. Von Dr. O. Liebreich. Berlin, 1869.

mens of the medicine, and Liebreich's report having been received in England, Dr. Richardson examined its properties, confirming Liebreich's statements, and considerably enlarging our knowledge of the medicinal action of the substance.* He also inclined towards Liebreich's theory as to its mode of action. Personne also supports this theory, and has advanced evidence in its favour. Dr. D. B. Russell has likewise found that typhus patients are very sensitive to the action of chloral hydrate; and, in explanation of this fact, he points to the opinion, that the alkalinity of the fluids is increased in typhus. Of course, the more alkaline the blood, the more rapidly the decomposition of the hydrate and the production of chloroform might be expected to take place.

But, whatever the value of Liebreich's theory may be, the chief thing is to learn what are the effects of chloral hydrate—what is its real value as a medicine? One of the earliest to try it in England was Mr. Spencer Wells.† Since then it has been employed so extensively, that it may be useful to gather up somewhat the knowledge acquired as to its value. There does seem not a little danger of its being erected into a kind of panacea for all the ills that flesh is heir to, of its true worth and fame suffering from too indiscriminate use. Its value is probably too great and too real for actual eclipse by its abuse; but the repute of this medicine may be dangerously compromised.

Hydrate of chloral ought, when used as a medicine, to be perfectly *pure*. When impure it has, like impure chloroform, highly irritating properties, and in the formation of chloral other chlorinated compounds may be produced. These must be carefully removed. In the great demand that has arisen for chloral hydrate, and the desire to cheapen its production, there is danger of impure specimens being supplied.

Liebreich stated that, in sufficient doses, the hydrate produces, after a short interval, deep sleep, and when carried far enough, complete anæsthesia; that its action is not accompanied with excitement, and that it leaves no bad after-effects. Dr. Richardson concluded from his experiments that "deep and prolonged narcotism can be safely produced by the hydrate; that, during a portion of the period of narcotism, there may be complete anæsthesia with absence of reflex actions; a condition in which every operation fails to call forth consciousness, and that, during the narcotism, there are intervals of apparent exalted sensibility." But he observes the insensibility and the sleep this hydrate produces do not represent or rival the action of the volatile anæsthetics we use for abolition of pain during surgical operations. Moreover Demarquay, of Paris, in his experiments on rabbits, failed to observe any anæsthetic state; but he found that the animals, though thrown into most perfect sleep, were in a state of highly-exalted *hyperæsthesia.*

On the whole it appears experience has shown that the hydrate is not truly anæsthetic; that very large doses will produce heavy and prolonged sleep, but not true anæsthesia,—certainly that anæsthesia cannot safely be induced by it. There is but very slight record of direct evidence on this point. Professor Nussbaum tried it as an anæsthetic in the Munich Hospital; out of twenty cases it caused anæsthesia in only one, that of a woman of weak constitution. All the other subjects experimented on experienced only drunkenness, and they said the pain caused by operations was less severe than under the influence of chloroform, sometimes even being scarcely felt, but only the one experienced no pain at all.‡ This report is so imperfect as to be all but useless; and it may be taken for certain that to produce anæsthesia the hydrate must be given in toxic doses. M. Noira relates,* as a warning, a case of amputation under the influence of chloral hydrate. The patient, a man of sixty-four, took five grains of the hydrate; in two hours amputation of the leg was performed without his making a movement or uttering a cry. But the pulse then became filiform and uncountable, while a state of alarming coma lasted for eleven hours. Then violent delirium came on, with vomiting and pain in the stomach, lasting for eight hours, and leaving the patient in the most extreme prostration, the bad effects of which did not pass off for many hours longer.

From smygmographic observations made by M. Bouchat, Drs. Anstie and Burton Sanderson,† it appears that chloral hydrate contracts the arterioles. Dr. Russell Reynolds has also recorded a case in which a dose of 50 grains produced most alarming toxic effects in a lady of middle age. "The superficial pulses were almost imperceptible, and, when they could be detected, were excessively rapid, weak, irregular, and intermittent. The heart was regular in its beat, although feeble, and intensely rapid in its pulsations." Hence it would seem that the drug produces arterial anæmia of the brain when given in hypnotic doses, and it can hardly be desirable to push that effect by very large doses. M. Bouchat considers it to be contraindicated in cases of organic cerebral and cardiac mischief; certainly its effects may be feared in cases of fatty or otherwise weak heart.

But, as a hypnotic, there is no doubt Liebreich has placed in our hands a most valuable and admirable medicine. As a sleep-compeller it is, in a very large number of cases, unrivalled; for while, in power, opium alone can be compared with it, there is this superiority to opium, that its use entails no unpleasant after-symptoms,—no headache, no nausea, no anorexia, no constipation,—while the sleep it produces is gentle, calm, and continued. At least this is the general rule, though there have been cases where chloral hydrate has excited unpleasant effects, such as nausea and painful dreams. Cases of this kind will occur now and then, so long as human beings differ so greatly in temperament, constitution and sensibility to the action of medicine.

* Med. Times and Gazette, Sept. 4, Oct. 30, and Nov. 6, 1869.

† See Med. Times and Gazette, vol. ii. 1869, pp. 346 and 408.

‡ 'American Journal of the Medical Sciences,' April, 1870, from 'Mouvement Médicale,' Feb. 1870.

* 'Gazette des Hôpitaux,' Dec. 1869.

† 'Practitioner,' March, 1870.

CULTIVATION OF CINCHONA IN MEXICO.

Mr. Hugo Finck, Vice-Consul of the North German Confederation at Cordova, Mexico, writes as follows, under date 10 July, 1870, to Mr. Hanbury, who has favoured us with the extract:—

> * * You remember sending me some seeds of *Cinchona officinalis*: I sowed them and a good many germinated, but the plants were all lost save one. That plant is now 7 feet high and looking very healthy. Afterwards I got from Mr. Nieto about a hundred small plants of *C. Calisaya*, *C. succirubra*, and *C. Condaminea*, which are all growing amazingly well. Some are already 12 feet high, with leaves from 10 to 15 inches long and wide in proportion. One three-year-old plant flowered at the house of Mr. Nieto, but I think this was premature and caused by some impediment in the ground, as a large stone or some other obstruction with which the roots came in contact.
>
> In 1866, the late Emperor Maximilian obtained some cinchona seeds from England which he distributed in this country. Mr. Nieto got the largest share of those seeds, and as he took great pains with them he raised thousands of plants, which he distributed to a number of persons. Of these plants the greater part were lost through injudicious management, so that actually only about 300 are alive, of which number I possess one-third.

REPORT OF EXPERIMENTS ON THE BROMIDE OF POTASSIUM USED IN MEDICINE.

The bromide of potassium now used in medicine is remarkably pure. Out of six samples described below, only one contained iodine; and even in that case the amount of iodine was very minute. The crystals of bromide of potassium, like those of the iodide, are sometimes transparent and sometimes opaque; the latter kind containing a certain amount of water, while the former are almost, if not entirely, anhydrous.

Analyses of these six samples gave the following results:—

No.	Obtained from	Quantity taken.	Silver-salt obtained.	Silver required.
		Grains.		
1	Eye Hospital, Moorfields; transparent kind	5·955	9·32	5·40
2	London Hospital; ditto	5·955	9·32	5·40
3	Douthwaite, 58, Bishopsgate Street; ditto	5·955	9·22	5·40
4	Skin Hospital; ditto	5·955	9·40	5·40
5	Warner and Co., Fore Street; ditto	5·955	9·26	5·40
6	Bell and Co., Oxford Street; opaque kind	5·955	9·05	5·26
	The theoretical numbers for absolutely pure bromide of potassium are	5·955	9·40	5·40

A determination of water was made in the sample of opaque bromide (No. 6). It contained 2·7 per cent. of water.

The sample No. 3, from Douthwaite's, contained a trace of iodide of potassium; all the rest were quite free from iodine.

These results show that chlorides are almost entirely absent from the commercial bromide of potassium in some instances; and that in the worst of the samples examined there was not more than 5·2 per cent. of chloride of potassium.

The method of examination adopted in this case was the same as that described in the Report on iodide of potassium.—*British Medical Journal.*

THE MILK AND WHEY CURES.*

BY DR. HERMANN LIEBERT,

Professor of Clinical Medicine in the University of Breslau.

The time is past when mineral waters were regarded as simple units (without reference to their constituents), where the mysticism of the healing power of the spirits bubbling from the depths of the earth had a particular charm, not for the layman only, but also for many practitioners; when the might of the propitious Naiads within the province of balneology gave rise, not only to large numbers of doggrel verses, but to a still greater quantity of prose writing. Natural philosophy, chemistry and experience sifted by a process of severe criticism, have at last begun to bear sway even in this department. We have become aware that the ghosts rising from the deep are nothing but aerated water impregnated with salts derived from the soil and rocks through which it has flowed, and from this fact we derive a knowledge beneficial to therapeutics, as to the proper relations of solution and chemical combination. Of the gases again, we know that sulphuretted hydrogen for instance, is generated by the decomposition of sulphate of lime or other sulphates; the bubbling carbonic acid from carbonated salts, earths, and particularly from carbonate of lime. From a chemical point of view we are better acquainted with the mineral waters than we are with most of our composite medicines; we know that their temperature depends on a definite law, that of the increase of the heat of the earth by one degree Centigrade for every hundred feet in depth; we know that from the very cold to the hot springs, physical condition as regards temperature exercises a decided influence on their action.

Concerning the bath, it has been ascertained that the salts contained in solution are not at all, or but little, absorbed by the skin. Consequently that a direct influence is exercised by the bath only in diseases of the skin or in affections which have communication with the skin by means of fistulous sores and otherwise. The unquestionable influence exercised on the nerves of the skin is much weakened by the epidermis, but nevertheless the physical action of the bath becomes quite prominent in the majority of diseases which do not directly concern the surface of the body. Here temperature plays a most important part; also in douches the degree of concentration, the force of the jet and the height from which the water falls; in vapour baths minute atomization and high temperature, etc.

The more hygiene becomes a subject of close and profound investigation, the more does climatology attain to its full and important rights. On taking a survey of many and accurate meteorological, physical, geographical, and geological investigations, it is found that they afford to the physician many useful and important data, but at the same time they impress him with a feeling of the responsibility of acting on a strictly critical and scientific basis in respect to such knowledge.

The courses of treatment by milk and whey occupy a prominent position amongst the hygienic courses, which are very often combined with climatic and mineral-water treatment. They are annually ordered for so large a number of patients that it seems very necessary a clear idea should be given of them; since, on the one hand, the milk cure, more particularly with respect to the different species of animals which supply the milk, has not yet been sufficiently appreciated, whilst on the other hand, the course of treatment by whey has been very much over-estimated, having attained to such proportions in the watering-places of Silesia as to render the latter rivals even to those of Switzerland. Most health resorts where the whey cure is practised have an advantageous climatic position; their arrangements and the whole mode of life in them are well arranged; the medical advice is mostly derived from full experience and beneficial results in chronic cases cannot be denied. Nevertheless, we must in many cases confidently conclude that the patients have been benefited or cured, not in consequence of, but in spite of the whey. Concerning this point, a want of knowledge in natural philosophy and chemistry is felt by many physicians, and this again proves that secular traditions must not be mistaken for verified experience.

The author then makes the following remarks on the chemical nature of milk and whey:—"If we compare different kinds of milk with reference to their solid constituents we find that asses' milk is most dilute, containing scarcely 9 per cent. solid matter; next stands human milk with somewhat over 11 per cent.; next, goats' milk with 13½ per cent.; next cows' milk with over 14 per cent.; then sheep's milk containing 16 per cent. (according to an analysis recently made in my laboratory, even 18 per cent.); lastly, mares' milk, containing 17 per cent. From these facts asses' milk would be applicable in cases where dilute milk seems desirable. Goats' and cows' milk represent the average quality; sheep's milk would be suitable when that containing a large amount of nourishment is thought necessary, and it is preferable to the rich mares' milk—which in the

* Abstract of a lecture published in the 'Medical Times and Gazette.'

central parts of Europe is also frequently applied to therapeutic purposes—because it contains a larger quantity of albumen and casein.

"Still more important than the total amount of the solid matter, is the amount of casein and albumen. Excepting mares' milk, which is excessively poor in this respect, human milk is the poorest, containing only 4 per cent. of casein, whilst cows' milk contains nearly 5 per cent., with more than ½ per cent. albumen. In direct opposition to the latter stands asses' milk, with only 2 per cent. casein and albumen; for this reason it is beneficially employed in inflammatory chronic diseases, in which the supply of nitrogenous matter must be confined within moderate limits. Goats' milk, with 5⅗ per cent. of casein and albumen, is particularly characterized by its large amount of albumen, which is 1⅓ per cent., while sheep's milk is in this particular again the richest, since of 5⅓ per cent. of casein and albumen, as much as 1⅗ are albumen.

"Asses' milk contains also the smallest quantity of butter, whilst cows' and human milk contain 4½ per cent., sheep's milk nearly 6 per cent., goats' milk nearly 7 per cent. Goats' and sheep's milk contain, again, the largest amount of hydrocarbons; the sheep exhibiting the enormous value of the nourishing constituents of its milk by its containing 11¼ per cent. of proteine matters and hydrocarbons.

"The milk sugar amounts on the average to 4 per cent. in the milk of the cow, goat, and sheep, while there is more than 5 per cent. in the milk of the ass.

"The salts, chlorides of the alkalies, earths, etc., amount to ½ or ⅗ per cent. on the average in different kinds of milk. The large amount of milk-sugar in mares' milk, viz. 8 per cent., only moderately increases its nutritive value, but renders it prone to alcoholic fermentation, whence arises its manifold application in the 'Koumyss' cure treatment practised amongst Tartar tribes."

POPPY CULTURE IN NORTH AMERICA.

In order to supply the requirements of American pharmacy, the cultivation of the poppy has been commenced in various parts of North America. According to the 'Journal de Pharmacie d'Anvers,' the Californian agriculturists have tried it upon a large scale, and as they have been assisted by the extensive experience of the Chinese, great numbers of whom are now settled in the State, the experiment has succeeded very well.

There is much in this enterprise to tempt the farmer. It is well known that the poppy will grow in almost every kind of soil, and in nearly all climates, and that it needs very little skill for its cultivation. The amount of labour, too, required for collecting the opium is small. No process can be more simple than to split open the poppy-head when it is mature, and to extract from it the milky juice; this is rolled into a ball by means of a spatula with as much ease as a dairymaid forms a roll of butter. Twenty-four hours afterwards, the opium is ready for sale.

The poppy is also cultivated in Louisiana. Last spring a farmer planted seven acres with it there, and he hopes to collect fifty pounds of opium per acre. This would be an excellent return; but much depends, as in the case of cotton, upon the rapidity with which the gathering is done.

The 'Journal of Applied Chemistry,' in a recent number, states that Mr. C. Wilson, of Monkton, Vermont, sowed in the spring of 1868, rather more than six and a quarter acres with opium poppy seed. The yield from the gathered juice of the poppy-heads, or capsules, was 140 pounds, which, when dried, became marketable opium. For this the grower obtained prices ranging from eight to ten dollars per pound, from druggists and physicians in New England. The opium furnished 6·25 per cent. of morphine. It is stated by Professor Proctor, that with greater care in obtaining the pure juice of the capsules, the opium might be made to yield 10 per cent. of morphia. The proportion of this alkaloid which the best Turkey opium is capable of affording, varies from 9 to 14 per cent.

LARGE DOSES OF CHLORAL.

The following account of the effect of an overdose of chloral upon the writer, who was suffering from insomnia, has been furnished to the 'Lancet':—

"With the exception of want of sleep, I am otherwise in good health. I have found out that alcohol, taken in excess, will in my case procure sleep; but in it I have no sort of inclination to indulge, and therefore it is that I am obliged to have recourse to narcotics. I have tried morphia, both bimeconate and muriate, and have experienced from its exhibition anorexia, nausea, and want of energy; cannabis indica almost provoked delirium, and bromide of potassium had no effect whatever. So you may be sure I was delighted when I saw the first account of hydrate of chloral in your Journal. I procured a supply without delay, and for months had the intense delight of refreshing sleep, waking in the morning with a good appetite, and fit for any amount of work. But, alas! its effects were not lasting. In the beginning 20 grains would have the desired effect; but latterly I have often taken as much as a drachm without any effect at all. On the night of the 2nd August I took 1 drachm of the hydrate of chloral at about 11 o'clock, and soon after went to bed. At 1, finding myself hot, restless and weary, I determined to take another dose. I could find no matches in the room, and, as I did not like to alarm the house, I took the bottle of chloral syrup (20 grains to 1 drachm), took a mouthful, and again sought sleep, but with no better result. Being teased, wearied and stupefied, but without any inclination to sleep, I again sought the syrup, and again took another very large mouthful. I was scarcely in bed when I was fast asleep and slept soundly from about 2 till half-past 10 in the morning. A servant, who had occasion to enter my room about 6 in the morning, says that I was then snoring loudly. I was called at 10 o'clock and aroused with some difficulty. When I tried to get out of bed, I found, to my horror, that I had no control whatever over my legs from the knees down. I could not stand; my legs tottered, and I should have fallen had I not clung to the bedpost. I wish your readers to understand that I had the use of every part of my frame, except from the knees down. With the aid of a servant I dressed myself, and proceeded as well as I could to descend the stairs. In doing so I had several stumbles, and should have fallen were it not for my servant's support. I made a hearty breakfast and went about my business as usual, the only inconvenience I felt being the unsteadiness of my gait and a slight diminution of sensation about the lower extremities. On measuring the quantity remaining in the bottle, and knowing exactly how much it contained when I took the first dose on the night of the 2nd of August, I find that between the hours of 11 and 2 I swallowed about 7 drachms of chloral! Had I made a similar blunder with any of the other narcotics I have mentioned, I fear I should now be in that region where 'the wicked cease from troubling, and the weary are at rest.'"

ANTINEURALGIC OINTMENT.

BY M. ROUALT.

Aqueous Extract of Belladonna . .	14 grms.
Extract of Opium	2 "
Lard	14 "

Mix. Rub the parts affected by neuralgic pains with a piece the size of a hazel-nut. The friction should be continued for eight or ten minutes, or until the grease is completely absorbed.—*Journal de Pharm. et de Chimie.*

The Pharmaceutical Journal.

SATURDAY, AUGUST 20, 1870.

HOSPITAL DISPENSING.

A case tried at one of the London police courts this week will serve to show that some of those medical authorities who are most urgent in pressing the adoption of stringent restrictions upon dispensing by pharmaceutists are by no means the most earnest and careful in themselves adopting such precautions. Jane Brant, aged thirty-four, a married woman, was brought before Mr. Cooke by the police. They had been called to the defendant's apartments, and there found her suffering severely from the effects of poison which she had taken. She was an out-patient of the Royal Free Hospital, Gray's Inn Road, and had a lotion and some medicine given her. Both the medicines were in quart bottles; the lotion was labelled poison in large letters, but in the dark she had drunk some of it by mistake. It was rather an odd reversal of the usual current of affairs under such circumstances, to find the prisoner charged with criminal negligence before the magistrate. But the woman, it was stated, was not unknown at the court; they placed her at the bar to have the matter investigated. She was, of course, discharged, but she got the reprimand which would probably have fallen to the share of the institution had that been one of a private character instead of being public.

There is unquestionably a good deal of carelessness about bottles, and labels too, at a great many hospitals. The patients usually find their own bottles and jars, and any poisonous compounds find their way into harmless and familiar vessels, the customary receptacles of various household drinks and domestic dainties. Very strange and potent confections find their way into old jam-pots. Hemlock and the deadly nightshade are passed into vessels long identified with British wine and stronger drinks; and the same bottle may be seen making alternate pilgrimages to the public-house and the dispensary of the best-regulated hospitals.

So much laxity in high places is not without its dangers, both of fact and effect, inherent and by example. If the system of poison-bottles be anywhere openly set at defiance, it is at hospital dispensaries in the out-patient departments; and this, too, in dealing with the least educated and most careless part of the population; those who have the smallest opportunities of precaution in storage of their prescribed medicines, and who are the most liable, by absolute ignorance and by intemperate habits, to omit to study their labels.

HELP FOR THE WOUNDED.

The eloquent appeal made by the 'Times' last Monday in behalf of the sick and wounded in the present war, will doubtless meet with a cordial response throughout the kingdom. A society has been formed for this purpose, under the presidency of the Prince of Wales, and considerable subscriptions have already been given, the Queen heading the list with a contribution of £500. This Society works under the Red Cross, adopted by the Governments of Europe at the Convention of Geneva as the badge of neutrality. Its agents are respected as neutral, and they succour the wounded of both sides alike.

A Committee of Ladies has been formed for collecting, preparing, and issuing materials, while the Central Working Committee, presided over by Lieutenant-Colonel Loyd Lindsay, will provide for surgical and other aid being sent out at once.

Believing that many who are connected with pharmacy would gladly contribute towards this laudable undertaking, we venture to suggest that they should do so in concert, and that a fund should be raised to hand over to Colonel Lindsay's Committee as the contribution of British Pharmacists. This body numbers no less than some 12,000 members, and though some might say that what they could afford to give would be little assistance to such a great undertaking, it must be remembered that even a small subscription individually, would amount to a very considerable sum in the aggregate. We hope therefore that this suggestion will be favourably received by the trade generally, and all connected with it, each helping to the extent of his ability. We do not fear in that case obtaining a result that will be creditable to the whole body. Contributions are requested of money, lint, sticking-plaster, chloroform, chlorodyne, quinine, morphia, carbolic acid, etc. We propose publishing weekly a list of Subscribers to the Fund, and we have much pleasure in stating that Mr. Bremridge has consented to act as Treasurer.

THE REGISTER OF CHEMISTS AND DRUGGISTS.

A recent correspondent, in referring to the fact "that grocers who have sold drugs are now registered chemists," adds, "time, of course, will settle the many sham druggists now afloat," and no doubt he is so far correct in his opinion; but there is no need for the realization of this result being left entirely to the sure though slow agency of time. There is now an official Register of Chemists and Druggists, which contains a list of all members of the trade, with statements of their respective qualifications. This book is supplied by Government, just as the Medical Register is, to all the law courts in the kingdom, and to various public officials, numbering in all 1306, so that it is easy for magistrates or judges to ascertain whether a person coming before them in reference to any case is or is not legally qualified to practise pharmacy.

That this is not sufficiently attended to we have frequent occasion to notice, and we think it desirable for the general credit of the trade, to call especial attention to the matter. As will be seen in another part of the Journal, a person who has no place on the Register has recently been convicted of obtaining goods under false pretences, and he is described as a "chemist." This case affords an illustration of the readiness with which titles, improperly assumed, are recognized without further notice or inquiry, and we can scarcely be considered unreasonable in expressing the hope that in future both public officials and editors will avail themselves of the means afforded by the "Register" for preventing impostors from representing themselves as belonging in any way to the pharmaceutical body.

The Society's Local Secretaries throughout the country would also do good service by looking after these and similar cases. We have just received from a correspondent a circular bearing the name of the proprietor of a Provincial Medical Hall and Drug Establishment, who describes himself as being a "Registered Chemist *of the Pharmaceutical Society, London*," though he is in no way connected with the Society.

ACTIONS AGAINST DRUGGISTS.

Under the head of Legal Intelligence will be found the report of a case that will doubtless interest many provincial pharmaceutists. Mr. Barker, the defendant in that case, writes to ask if there be any fund available in the Society to defend actions of the kind. There is not any such provision; but the fact that pharmacists are liable to suffer from legal proceedings taken against them without due cause, is sufficient to show that the subject is one worth consideration.

Even in the event of a successful defence being made in such cases, costs are incurred in money, time and anxiety, which in fact amount to an unjust punishment. Only a few weeks ago* we had occasion to notice a case in which a defendant was condemned to costs, though there did not appear to be any ground for the verdict, so far as the report of the case went, and it is probable that some organization calculated to deal with such cases would be good for the general interests of the trade.

THE article we republish this week, from the 'Lancet,' on the subject of "Pepsin," will doubtless attract the attention of the makers of this remedy, and we shall be glad to receive from them any remarks on the subject which will lead to its being more generally understood.

* See *ante*, No. 5, p. 93.

Proceedings of Scientific Societies.

LONDON INSTITUTION.

On the 10th inst., J. P. Gassiot, Esq., D.C.L., F.R.S., distributed the prizes awarded, and certificates granted, to students who passed the examinations connected with the courses of educational lectures delivered during the past session by Professors Guthrie, Bloxam, and Bentley. The prizes consisted of standard works on physics, chemistry, and botany, handsomely bound. Dr. Gassiot stated that Prof. Odling would open the coming Session with a course of educational lectures "On Chemical Action," and that, after Christmas, Prof. Huxley would deliver a course "On the First Principles of Biology."

BRITISH MEDICAL ASSOCIATION.

THIRTY-EIGHTH ANNUAL MEETING.

Newcastle-on-Tyne, August 9th, 10th, 11th and 12th.

After the preliminary gathering of members and their friends at the Reception Room on Tuesday, there was a meeting of the Council, at which the chief business was the election of Mr. Ernest Hart as Editor of the Journal. At a general meeting held in the Lecture Room of the Literary and Philosophical Institution in the evening, the retiring President, Dr. Chadwick, in opening the proceedings, spoke of the influence exercised by the Association in reference to the Medical Acts Amendment Bill and dwelt strongly on the power of the Association to promote professional advancement. Then, after a passing mention of the losses the medical profession has sustained by deaths within the past year, he expressed his high sense of the honour that had been conferred upon himself and, with the appropriate words, "The President is dead! Long live the President!" relinquished the presidential chair to his successor, Dr. Charlton, who, in his inaugural address, reviewed at length the subjects of medical politics and sanitary reform, urging their extreme importance in regard to the general prosperity of the country. Referring to the time when the title of the Association was changed from Provincial to British, he said:—

It was then that, for the first time, our interests in the provinces became thoroughly identified with those of the profession in the metropolis. Since then, we have worked in perfect harmony with our London brethren, no longer regarding them as mere visitors, but welcoming them to our provincial meetings as *bonâ fide* members of the Association. Indeed it seems to us that most of the great reforms of our profession have taken place subsequent to this change of name—to this amalgamation of provincial and metropolitan interests. Although the deficiencies of medical education and the condition of the medical practitioner, had long before been discussed in our journals and set forth in language sharp and incisive as that of Junius, still it is only within the last two decades that the whole profession, tired of calling upon Jupiter, has unanimously put shoulder to the wheel and moved, with one accord, to remedy our wrongs. United by its able journal, united still more by the cordiality engendered at these annual meetings, the British Medical Association has pushed forward in the path of medical reform and the general regulation of the profession. Now the struggle for a good standard of medical education is finally before us. Hitherto the paramount obstacle to progress has been the multiplicity of sources from whence licences to practise medicine have been derived. No uniform standard of education could be kept up amid these jarring interests. The well-meant endeavours of the Medical Council, by sending out examiners to visit the different universities and corporations was no guarantee for permanent improvement; these bodies were ever competing for licentiates and were exposed to the deadly temptation of lowering their standards of education to attract more graduates. Against this crying evil there was but one remedy—a single gate by which all should enter the profession; a single but searching examination for the licence to practise."

For attaining this, he insisted upon the necessity for the great mass of practitioners being directly represented in the Medical Council and he regarded the recent action of the Government as acknowledging the existence—outside the Medical Council—of an interest and a power that it was the business of the Association to augment and consolidate.

Passing from the question of educational reform, Dr. Charlton went on to say that, when that shall have been settled, the Association would still have before it the wider field of sanitary reform, the prevention of zymotic disease, the cleansing of our cities and the purification of our rivers. In these matters some of our most time-honoured institutions are pre-eminently defective. With all our liberality of thought, and our boasted tendency to progress, it must be confessed that we in England are, in many respects, wonderfully conservative. We hold pertinaciously to an institution simply because it is an ancient form of procedure peculiar to our own country. We often cannot bring ourselves to acknowledge that what was advantageous in older and ruder times is quite unsuitable to the present state of society.

We have, however, the subject of hospital improvement, so ably advocated at the Leeds Meeting by Captain Douglas Galton. We have, too, the coming struggle as to the extension or the repeal of the Contagious Diseases Acts, where a band of strong-minded women and weak-minded men are striving to reverse the verdicts of the wisest and the best of the medical and legal profession. There will be no lack of objects for the energies of the rising generation and when, in after years, they shall peruse the records of what was done at this Newcastle meeting, they will, we trust, return a kindly verdict that we did our best, according to the lights we were then permitted to enjoy.

After the usual vote of thanks, the Secretary read the Report of Council, showing that there were now 4258 members on the books. The subsequent proceedings were tedious and somewhat disorderly.

On Wednesday, after the members of the Association had breakfasted with the Sheriff of Newcastle, the second general meeting was held and Mr. Whipple, of Plymouth, was elected President for the ensuing year. The address in medicine was then delivered by—

Dr. Sibson, who characterized the present age as being marked by experiment and exact inquiry, directness of aim and skilled power to do the work required, with completeness and economy. The labour of the past was surpassed, but not superseded; while nothing that had been done was lost, invention would still awaken invention, discovery would follow discovery. Each advance was a fresh starting-point for the future labourer. It was, indeed, everywhere taken for granted that, good as this or that work might be, better work—more simple and more to the purpose—still remained before them. The ship, the bridge, the rail, the telegraph and the gun of the present day, as compared with the past, were types and marks of the advance in the skill, precision and energy of the time. Medicine, too, partook of the movement that was going on around them. The knowledge of disease was becoming at the same time more accurate and more large. Each year gave them a better knowledge what medicines could do, what they could not do. If the spirit of scepticism had shaken the belief of a few in the medicinal means at their command, that spirit had aroused inquiry and cemented belief which was rapidly shifting into knowledge that would be secure. Those great old forms of medicine—the tincture of the muriate of iron, the sulphate of quinine, opium, the iodide of potassium, the infusion of digitalis, an occasional shot, but not a battery or running fire, of calomel—all those things, in fact, that had served their fathers well, would serve the present generation better. They knew what these could do when they were wanted, as well as when they were not wanted, so that, with gathered power, they applied them at the proper moment. Then science reached forth its arms, adding recently-discovered remedies to those of the day just gone by, chloroform, bromide of potassium and the still more newly-discovered hydrate of chloral. So knowledge of disease ripened, until the aim in its treatment became more precise and vigorous. Men asked themselves at each step they took, why they did this or that. Reason had taken the place of routine, while rational medicine had become at last the common property of the profession. Side by side with the use of medicine, not second to it, was the so-called hygienic treatment of disease, the study and regulation of the vital forces. The influence that every physician exercised upon the mind and, through the mind, upon the body; the soothing or stimulating of the nervous power; the calming of exaltation or the stirring up of apathy; the quieting of the over-busy brain or the spurring of the flaccid will; the repose of over-used powers or the awaking of suspended vital functions; the subduing of the over-sensitive skin or the stimulating of it when wan, muddy and lifeless; the limiting of supplies to an over-fed frame, or the repair of the body wasting with disease, by the proper kinds of food and stimulants; the bringing into play and, as it were, into fresh existence, muscle that had become wasted and paralysed by disease,—these were all among the aims that the physician sought to accomplish. These were among the means that he sought to employ irrespective of, but by no means without the use of medicine. These were the agencies that they all held in their power; that each of them exercised daily in coping with the various forms of malady, ailment, and constitution. There was a method of treatment, that of rest and ease, belonging to this great class, which he had himself been employing with deep interest in acute rheumatism and acute gout for some years. Therefore, it might be of interest if he narrated the results of his experience in that method of dealing with a disease that did so much to cripple the heart, limit the bodily powers and shorten life. During the last four years he had submitted all his patients in St. Mary's Hospital—affected with acute rheumatism and acute gout—to a rigid system of absolute rest, protection from external injury, gentle pressure, equal warmth and the removal of pain chiefly by treatment from without. Those two diseases, often so apparently identical, differed, as they would know, in this, that, while rheumatism attacked those whose blood and tissues were previously healthy, being produced by over-work and exposure, gout seized upon persons whose blood and tissues were already infected and contained uric acid in excess. In acute gout, therefore, he always gave iodide of potassium and sometimes colchicum, in the hope of getting rid of the special poison; but in acute rhematism he gave no internal medicine during the actual stage of the disease, unless it was called for by some special reason. He gave his patients no coloured or flavoured liquid to make them think they were taking medicine when they were not doing so, because he did not think it quite right and did not find it needful to employ such a system of fiction. If they did so, they complicated their observations, deprived themselves of the help that the patient could give them when he understood the aim of the method of treatment. Whatever might be the line of treatment adopted for disease, the influence of treatment on the disease itself was less than the physician was apt to think. The great majority of diseases tended to get well. They had, so to speak, a lifetime of their own, with its periods of growth, maturity and decline; they were the passing tenants of the body which they occupied, often with great injury, for a limited time. Treatment could not change their nature, could not expel them at once, could not quench them, could not materially shorten or prolong their existence. But treatment could lessen the sufferings of the body occupied by the disease, shield it from outer injury, repair its waste, support and reinforce its powers; while it could ward off those causes which tended to increase or re-awaken the disease by lessening the intensity of its action, inflammatory or otherwise, especially upon the local structures. To watch, then, the treatment of a disease was to watch, so to speak, not the remedy and its immediate effects, but the disease itself and its behaviour during a certain method of treatment. The thoughtful physician, while taking notice of this or that change in the malady, knew that such change was due mainly to the natural growth of the disease; he did not attribute it to the means which he had employed unless he had good grounds for doing so. Dr. Sibson then proceeded to describe in detail the working of his rest and ease system as carried out in St. Mary's Hospital.

Among the papers read at the several sections, the following possess an interest for pharmaceutists:—

Dr. Sansom read a paper "On the Sulpho-carbolates, and the Antiseptic Method in Medicine," in which he alluded to the difference of opinion with regard to what is termed the "germ theory" of disease. He thought much of the diversity depended on the connotation of the word "germ." There is abundant evidence that the "contagia" of transmissible disease are material and organic; they bear a strong analogy to ferments in their mode of operation; whatever the initial cause of each, the existence of organized material possessed of reproductive powers is intimately bound up with both processes. The author alluded to the recent researches of Chauveau on vaccine, glanders, and sheep-pox, as showing that the activity of "contagia" depended on the solid particles proved by Beale to be actively-moving masses of bioplasm. He considered the efficacy of disinfectant and antiseptic measures was due to no obvious chemical influence, but to the poisoning of those septic organisms which are intermediary agents of decomposition between organic and inorganic matter. He thought that the proliferation of contagia (bioplasm) might be checked within the living body. He then discussed Polli's treatment by the sulphites. From the well-known properties of carbolic acid he hoped more from the sulpho-carbolates, of which he gave a succinct description. (1.) The *alkaline sulpho-carbolates*. There was evidence of great success from the administration of the sodium salt in throat ulcerations and in scarlatina. There was promise of success in variola. In enteric fever, Dr. Ligertwood, of Newbury, considered the treatment to be efficacious. (2.) *Sulpho-carbolates of alkaline-earth metals*. Of these the most interesting is the very soluble calcium salt which the author had employed in cases of rickets with remarkable success. (3.) *Sulpho-carbolates of the metals*. The zinc and copper salts had been used by surgeons, especially by Mr. John Wood, as antiseptic dressings for wounds. A very favourable opinion of them had been given. The author had employed the iron salt internally, with varying success; he was doubtful whether it had any advantage over other salts of iron. In conclusion, he hoped that the remedies would be tried upon their merits, as he considered that, all theory apart, they would prove a useful addition to the materia medica.

In the Physiological Section, Dr. Bolton, of Lancaster, drew attention to the Turkish Bath, expressing his conviction that, properly constructed, it would become a valuable addition to the British Pharmacopœia. He showed that it had been used by our forefathers 2000 years ago, and he regarded the part taken by David Urquhart in reviving the use of this bath as constituting him one of the greatest benefactors of the present age.

In the Section of Public Medicine, Dr. Leonard Armstrong read a paper on "Difficulties in applying Sanitary Laws," in which he took a retrospective glance at the efforts which had been made in South Shields to secure an abatement of the smoke nuisance. The water supply was an excellent one, the population increasing and prosperous; yet, on comparing the Registrar-General's return for the last two years, the mortality of South Shields exceeded Sunderland greatly. To what were they to attribute this excessive mortality in South Shields? Lack of pure air. The atmosphere was polluted with smoke and gaseous nuisances. Continuing his remarks, Dr. Armstrong enumerated the various efforts made of late years to abate the nuisances, and expressed his opinion that no abatement could be expected when local and interested authorities would not inflict the pains and penalties of the law. He hoped the President would support some representation that all future sanitary Acts should not be permissive, but unfettered by local interests and feelings.

Dr. Stewart, of London, mentioned that at the works of Mr. Titus Salt, at Saltaire, the smoke was consumed; what had been done by Mr. Salt, in his great establishment, might be done in nine out of ten of the manufactories of the country.

After some discussion, Dr. Armstrong moved the following resolution, which Dr. Robinson seconded, and it was agreed to:—

"That in future sanitary legislation the smoke nuisance and other gaseous pollutions of the atmosphere must be dealt with by compulsory measures to be carried into effect by authorities independent of the district, and instructed by competent local inspectors unfettered by local interests and feelings."

In the evening the members of the Association were entertained at dinner by Sir W. Armstrong at Jesmond.

The President's Soirée in the Town Hall was brilliantly attended. Among the objects of scientific and artistic interest were ornithological specimens, archæological collections, photographs and porcelain. The principal table was devoted to the display, under a series of microscopes, of some of the most remarkable results of modern zoological research in the collection of deep-sea organisms, kindly placed at the service of Dr. Charlton by Dr. Carpenter, V.P.R.S. It may be remembered that in the recent 'Lightning' and 'Porcupine' expeditions, in the course of which these specimens were obtained, the sea-bed was explored even to the enormous depth of three miles and these organisms were obtained, creating a large addition to our knowledge of several divisions of the animal kingdom.

On Thursday the Third General Meeting was held, and, after some business had been disposed of, the address on surgery was delivered by Mr. Heath. This was a most satisfactory and masterly production, philosophical in spirit, comprehensive and practical in its scope, besides being eloquently delivered. In sketching the characteristics of modern surgery, he remarked upon the "boldness and magnitude of its proceedings; its respect for the integrity of the human body, and its reticence of the knife. It stretches out its hand to regions, and takes within its grasp organs, formerly thought beyond its reach, grappling, not unsuccessfully, with diseases hitherto considered incurable by scalpel or drug. Dangers and difficulties do not appal it, nor does it fear to undertake the gravest responsibility, if only its audacity is justified by the well-founded hope of destroying a fatal disease, or removing one which, although not fatal to life, may yet render that life a misery, a burden so wearisome to him who carries it, that death itself is not a greater calamity than life so oppressed.

Paradoxical as it may seem, whilst in one direction it is thus acquiring new dominions and showing itself capable of the most daring enterprises, in other quarters it lays down the knife and employs measures more sure, safer, and attended with less suffering; or it substitutes milder for more severe operations, shrinks from unnecessary mutilation of the human body, in every way seeking to conserve and maintain its integrity as complete as may be compatible with the object to be gained.

I claim for it, moreover, that in its bold, as well as in its milder and more conservative measures, it realizes a larger and more uniform amount of success; is thus a more useful and reliable agent than the art of former days—a success which is the more satisfactory that, though brilliant, it is the result of sound principles, industriously sought after and carefully carried out.

After illustrating these views at length, tracing out the principles that lead to the success of modern surgery, and discussing various new methods of procedure, which would be out of place to describe in this Journal, Mr. Heath went on to speak of improved education, placing at the disposal of the student means of learning the use of his hands, as one of the chief causes of increased operative skill.

The interchange of knowledge, by means of the periodicals of the day, the rapidity with which a new and improved proceeding or a brilliant operation becomes known throughout the profession, tends also to the general level of our success. Moreover, I will venture to say that an association like this, which gives to us obscure provincials the opportunity of seeing and hearing the brighter luminaries of our time, that brings vividly to our minds every advance which from year to year may be made in our art, exerts a more potent influence upon the origination and spread of improvements and in the upraising of the general standard of professional power than has yet been recognized.

I have also made it apparent that our special branch of surgical art is not stationary, but progressive; and that we may fairly challenge comparison with other arts and sciences, both as to the amount and rapidity of our progress.

As the world grows older, as the results gathered by past workers and thinkers accumulate, each succeeding generation stands on more advanced ground than its predecessors; facts already ascertained furnish a basis whereon to build new and truer theories, more efficient instruments are at command to investigate and to construct; thus the arts and sciences which increase our knowledge teach us the properties and conditions of matter, tell us of the true place and value of this little world in the crowded universe, or forge us weapons to fulfil our destiny and subdue the earth, press onwards with more and more rapid strides.

Our fellow-workers, the physiologist, the chemist, and the physician, are not idle; the innermost recesses of living things are made to give up their secrets; the mysteries of life in health and in disease are wrested from the minute molecules of structure; new drugs rise from the alembic; strange plants yield up their juices and their fruits to soothe our pains or cure maladies hitherto incurable; and, with greater knowledge and more effective means, the physician advances to the combat of disease with bolder and more certain steps, with greater assurance of victory.

What have we, the votaries of the knife, to show beside these marvels? If we cannot answer this question, this address has been written in vain. Gibbon asserts that the meanest insect which crawls along the dome of St. Peter's is more worthy of regard, more wonderful than that magnificent structure. Human life is surely more precious than the appliances which are subservient to it; but life itself may be far below its value, or a mere burden, when cumbered by painful disease or by deformity. We have seen with what audacity the modern surgeon encounters the most formidable enemies of life, what slight traces of his work he leaves behind, how limbs are preserved and yet the diseased part taken away; with what facility the cripple is rendered active, the humpback made straight, deformities conjured into symmetry; with what safety the thickened lens is taken away from the eye, the torturing stone extracted from the bladder. We know with how much confidence he can say to yon poor wretch writhing in inextinguishable sickness, Suffer me to put you to sleep for a brief space; I will undo in a few minutes the cause of your complaint; you shall be a sound man in not much longer time than would see you in your grave without such assistance. That haggard creature, too, whose form is rendered misshapen, whose life is being exhausted by a monstrous growth, whilst she is unconscious he will take away the encumbrance that oppresses her, raise her in a few weeks from her bed of suffering, and restore her to the world a fresh and blooming woman.

But we must not boast too much; we must confess that there are still foes whom we cannot yet overcome; still wide domains where the great enemy death remains victorious, but which it is for us and our successors to rescue from his scythe and bring under the dominion of the knife.

Nevertheless what I have been able to relate of the achievements already accomplished, will suffice to show that operative surgery has not stood still whilst other arts have advanced; that, if we do not occupy the foremost place, we are at least well to the front in that glorious race which they win who do the most to diminish human suffering and prolong life; to elevate and improve the condition of man.

In the Medical Section—

Dr. John C. Murray read a paper on "Snuff-taking," in which he stated that according to the experience of himself and others, the habitual snuffer seldom or never dies from consumption. He further declared that six cases of recovery from phthisis had come under his own notice consequent upon free snuff-taking. He concluded that snuff-taking is in some degree preventive of consumption, and its frequent concomitant bronchitis, in virtue, perhaps, of its derivative and *quasi* counter-irritant action. The way to cure a cold, according to Dr. Murray, is to have recourse to snuff-taking at once.

The Public Dinner of the Association took place in the Town Hall in the evening, and the satisfaction of the members was warmly expressed for the facilities afforded so willingly by the corporation for the transaction of the Association business.

On Friday there was an excursion to Durham University, where honorary degrees were conferred on several members. The following papers were read at the sectional meetings:—

Professor Hughes Bennett read an interim report by committee investigating the antagonism of remedies, and illustrated the subject by experiments on some rabbits. Having given one rabbit the 150th part of a grain of strychnia, by which it was killed, he next injected the same dose into a second rabbit, as well as 12 grains of hydrate of chloral. The second rabbit, after having been thrown into a deep sleep, recovered, and appeared none the worse for the experiments made upon it.

Dr. J. Henry Bennett contributed a paper "On the Climate of Algeria," in which he brought forward important facts deduced from an exploration of Algeria made in the spring of 1869. Algeria is a kind of Switzerland, extending above 400 miles from east to west, from Tunis to Morocco, and about 120 from north to south, from the Mediterranean to the desert of Sahara. This region is entirely occupied by the Mount Atlas, which divides into three ranges, running from east to west—the Lesser Atlas, the Middle Atlas, and the Greater Atlas,—with connecting buttresses, intervening valleys and elevated plains. These mountains, not attaining an elevation of above 7000 feet, do not reach the line of eternal snow, so there are no glaciers to form large rivers. But they are high enough to precipitate rain and snow in winter from moist air. The constant rarefaction of the atmosphere over the immense desert of Sahara causes, nearly all the year round, a rush of cooler air from the northern quarters—that is, from the Mediterranean and the Atlantic, the atmosphere being thus all but constantly charged with moisture winter and summer. Rain and snow fall in abundance during the six months of winter;

and heavy dews fall at night both in winter and summer. The climate of the mountain region of Algeria is, therefore, rainy and cold in winter. Algiers, being on the sea-level, is warmer; indeed, warmer than the north Mediterranean shores, but moist and rainy. The average rainfall is thirty-six inches; the average number of rainy days is ninety. The climate of Algiers, being thus mild and moist, is not suited to those cases of phthisis that require a dry bracing air, such as is found on the east coast of Spain and the Genoese Riviera.

The treatment of drunkenness was considered in the Psychological Section, and the business of the Association was then closed by the concluding General Meeting, which measures in reference to the Medical Bill were decided upon.

One of the most attractive features of the present meeting was the Annual Museum held in the Library, the Museum, and the Hall of the Newcastle Infirmary, in where all new objects of interest to the profession were exhibited, under the superintendence of Dr. Page, of Newcastle. Large numbers visited it.

The principal exhibitions of objects interesting to Pharmaceutists were—

H. B. Brady, Newcastle, chemical and pharmaceutical preparations, among which were samples of chloral, the hydrate of chloral, hydrate of bromal, and chloride of ethylidene, the last new anæsthetic introduced by Dr. Liebreich; also a collection of medico-electrical apparatus, and a new mercurial lamp for calomel fumigation.

Messrs. Calvert, Manchester; specimens of carbolic acid.

Messrs. Ellis and Son, Ruthin; aerated and mineral waters.

Messrs. Harvey and Reynolds, Leeds; clinical thermometers.

Messrs. Hopkins and Williams, London; chemicals and pharmaceutical preparations, including Matthiessen's apomorphia, and the crystallized tartrate of ammonia, in which Dr. Bastian found living organisms.

Messrs. Orlando Jones and Co., London; bread and biscuits made of entire wheat flour.

Messrs. Krohne and Suzeman, London; various instruments.

Messrs. Mayer and Mottyer, London; various instruments.

Messrs. Newbery, London; French specialities, etc.

Messrs. Savory and Moore, London; pepsine, pancreatine, and chemical food.

GRANT COLLEGE MEDICAL SOCIETY, BOMBAY.

July, 1870.

A New Indian Remedy.

BY MR. NARAYAN DAJI, GRADUATE OF THE GRANT MEDICAL COLLEGE.

Ailanthus excelsa, Roxb.—Indian *Ailanthus*, Nat. Ord. *Simarubaceæ*.—In the following paper my object is to bring to the notice of the society a new indigenous article of materia medica yielded by the Indian *Ailanthus*, upon which I have experimented for some time past. My investigations into the medicinal properties of this simple, cheap and agreeable vegetable bitter, have led me to form a favourable opinion of its efficacy in certain diseases. Believing that an extended notice of this article, so common in many parts of India, might not be unacceptable to the members of the profession, I submit this communication to you, and trust that others may be induced, as opportunities offer, to determine for themselves its medicinal virtues.

The bark of the *Ailanthus excelsa*, Roxb., which is the article in question, is interesting firstly on account of its being almost unknown to the medical profession; secondly from the likelihood of its proving a useful substitute for one of the officinal drugs of the British Pharmacopœia. The tree is pretty common in many parts of India, and its bark can be obtained in sufficient quantity for general use. If attention be paid to the cultivation of the tree, the bark will, no doubt, be found to be still cheaper, and being an indigenous product, its use will tend to our advantage.

Collection, Preservation, etc.—The only part of the tree which is commonly employed as a remedial agent is the bark, frequently of the trunk, and rarely of the root. The leaves are said to be occasionally used in medicine, but they are free from the characteristic bitterness of the bark. The usual season for collecting the bark is either the cold or the beginning of the hot season; during the rains the process should be stopped on account of the difficulty of drying it, a point requiring particular attention. In order to strip the tree of its bark, it is convenient to fell it with a hatchet. When the tree is down and the useless smaller branches are cut off, the bark is easily removed by first striking it with the back of the hatchet, which causes the liber to loosen from off the sapwood. Before this is done, the useless and thick corky layer (epiphlœum) must be scraped off. The bark is then cut longitudinally so as to admit of its being turned up by the hand, when it comes off in large pieces, which are further cut into small ones so as to expedite its drying. The drying should be done as quickly as possible by exposing the pieces to the sun's rays; at night they should be covered to avoid the effects of dew. The hygroscopic nature of the active principle of the bark must be kept in view. If the precaution of early desiccation is not taken, a fermentive decomposition soon commences, the bark becomes mouldy, of a blackish colour, and begins to stink. A quantity of bark thus decomposed was in my possession, which, on being subjected to the usual process of extracting its active principle, yielded a dark blue compound having the smell of an indigo-vat and apparently resembling indigo itself, and which tinged the comparatively small quantity of the bitter principle obtained.

General Characteristics.—The bark of *Ailanthus excelsa* is in flat pieces, of various sizes and lengths, depending upon the manner in which it is removed and preserved. The largest pieces are sometimes one foot or more in length and about six inches in breadth, but on account of their friable nature, they easily go into small pieces by rough handling. In thickness the bark varies generally from a quarter of an inch to half an inch or more; the age of the tree, as well as the part from which the bark is chopped, much affect its thickness and general qualities. Its external surface is rough and irregular from a coat of corky layer (epiphlœum), which varies in thickness from two to four lines, and is marked with deep irregular furrows and protuberances; its colour varies from dirty-grey to yellowish-green; its substance is rather hard, gritty, and insipid. The *derm* (which in fact is the bark proper, consists of a porous outer portion (mesophlœum), and a compact inner portion (endophlœum). The former is about half an inch thick, of a uniform pale yellowish colour, porous, and fibrous. Its longitudinal section presents a reticulated fibrous structure marked with numerous pores, in which here and there are observed concrete masses of gummy exudation (pectine), which is of a pale brownish colour and insipid.* Its transverse section is rough, granular, porous and somewhat lamellar. The inner portion of the bark (endophlœum or liber) is about a line in thickness, pale yellow, smoother and more compact than the outer portion.

It is tough and fibrous, and, when fresh, sticky. In the fresh state the endophlœum and the mesophlœum, particularly the former, contain a glutinous and bitter substance of a deep orange colour which is the active principle in a state of combination.

The mesophlœum is easily pulverizable, forming a

* This is particularly seen in the bark of very old trees.

greenish-grey powder, which, when examined under the microscope, presents numerous crystals of carbonate of lime. The liber (endophlœum) is tough, and leaves fibrous pieces on being pounded. The dry bark is light and breaks easily across with a fibrous porous fracture. It scarcely possesses any smell, but has a pure strongly bitter taste, especially at its inner surface. The wood, as well as the leaves of this tree, are entirely devoid of bitterness.

Seat of the Active Principle.—On examining a section of the fresh bark with an ordinary magnifying glass, the meshes between the interlacing fibres of the liber are seen filled up here and there with a reddish- or orange-yellow and somewhat glistening amorphous substance, which abounds within the inner part of the liber. Intermixed with it, and covering the whole of the fibrous texture of the mesophlœum, are seen shiny rhombic particles of crystalline carbonate of lime. The yellow amorphous substance is very soluble in water, and extremely bitter, and is the active principle of the bark in a state of combination. It is found in the largest proportion in the thick bark of old trees. The thinner bark of the top and branches is less valuable, for it contains a smaller amount of the active principle.

Composition and Chemical Characteristics.—No complete analysis of the *Ailanthus* bark has as yet been made. My experiments, however, lead me to conclude the presence in it of an uncrystallizable bitter principle in combination with lime, carbonate of lime, salts of magnesia and alumina, uncrystallizable sugar, gum, a trace of volatile oil and lignin. The medicinal virtues of the bark depend entirely upon an azotized bitter principle possessing an acid nature, to which I propose to give the name of 'Ailanthic acid.' It is to this that the bark owes its bitterness.

A cold infusion of the bark, in the proportion of one ounce to twenty-four ounces of cold water, and allowed to macerate for twenty-four hours, was somewhat turbid, lemon-coloured, and very bitter. A strong decoction of it was turbid and highly bitter: when kept for some days, it slowly deposited a sediment, and the liquid became of a clear pale lemon-colour, and retained its bitterness. A tincture of the powdered bark, prepared with rectified spirit, was of a pale yellow colour and much less bitter than the decoction or infusion. The decoction exhibited the following reactions:—Tincture of iodine or tincture of the sesquichloride of iron produced no change; oxalic acid or oxalate of ammonia caused a copious white precipitate (oxalate of lime), insoluble in acetic acid; alcohol produced muddiness (from the precipitation of gum) in a concentrated decoction; protonitrate of mercury solution gave a copious white precipitate of a complex compound of the acid principle with mercury; solution of basic acetate of lead produced abundant white precipitate; alkalies produced no change except removing its bitterness, which reappears on the addition of acids; alkaline carbonates and earths showed no such effect; acids produced no change; litmus-paper showed no signs of acidity (evidently showing that the acid principle was in combination with a base).

Ailanthic Acid.—It was in the beginning of the year 1867 that I first noticed the existence of this principle in the *Ailanthus* bark. Owing to its uncrystallizable nature and its comparative insolubility in other solvents than water, the difficulty of obtaining it in a pure state is such as to make its analysis still unsatisfactory. I leave to abler chemists its further examination. The following method gives the process of manufacturing this substance:—

Exhaust the powdered *Ailanthus* bark by repeatedly boiling it with water, collect and concentrate the decoctions. When cold, filter and add a sufficient quantity of a strong solution of oxalic acid to precipitate the lime. Add a sufficient quantity of strong solution of basic acetate of lead, which precipitates gum, extractive matter, colouring-matter, and excess of oxalic acid; filter. Concentrate the clear liquor on a slow fire, remove it when cold into a proper vessel, and pass through it sulphuretted hydrogen gas so as to precipitate all the lead; boil, filter, and evaporate the clear liquid on a water-bath.*

The proportion of ailanthic acid contained in the bark varies a good deal according to the age of the tree, as well as the thickness, collection, and preservation of the bark. The average quantity of acid I obtained from two pounds of good thick bark was nearly one ounce.

Properties, etc.—When solid, ailanthic acid is of a waxy consistence, reddish-brown, becoming dark coloured when liquefied, almost inodorous, deliquescent, very soluble in water, much less so in alcohol or ether, insoluble in chloroform or benzole. It is uncrystallizable and is extremely prone to become glutinous, even when kept in a stoppered phial; on account of its hygroscopic properties, it swells so much as to be preserved with great difficulty in an ordinary bottle. Its aqueous solution absorbs oxygen. When heated, it swells, burns, and leaves ash, consisting chiefly of carbonate of lime and salts of alumina. Its taste is purely and strongly bitter, it reddens litmus, is neutralized by alkalies and strong earths, forming combinations which are devoid of bitterness. Its compound with ammonia is readily decomposed by heat, leaving the acid free. It decomposes the carbonates of alkalies, of earths, and of several metals, especially when aided by heat, and takes the place of carbonic acid, which escapes with effervescence; the compounds thus formed are all more or less soluble in water and are bitter. When heated along with a strong solution of caustic potash, ammoniacal fumes are given off, indicating the presence of nitrogen in its composition. When heated along with strong sulphuric acid, it becomes blackened and a penetrating odour is evolved. Hydrochloric acid produces no change when cold, but, on boiling, it changes its colour to a deep dark red. Nitric acid oxidizes it immediately with the production of effervescence (from the escape of nitrogen), especially when boiled, it makes the liquid clearer and paler. Chromic acid produces no change. Tincture of galls gives no precipitate. Protonitrate of mercury solution gives a copious white precipitate, which is blackened by the addition of ammonia; this forms one of its characteristic tests. Persalts of mercury give no precipitate. Chloride of gold gives a dirty purple precipitate, which slowly exhibits greenish and purplish tints by reflected light. Chloride of platinum gives no precipitate. Nitrate of silver gives a whitish precipitate, which soon turns dark coloured. Diacetate of lead gives a white precipitate, but does not throw down the whole of the ailanthic acid. Acetate of lead produces no change. No evident changes were produced under the following tests:—Chlorine water and ammonia; oxalate of ammonia; red and yellow prussiates of potash; sulphocyanide of potassium; protochloride of tin; potassio-tartrate of antimony; proto- and per-salts of iron; and sulphate of copper.

Ailanthic acid does not possess the power of setting free iodine from a solution of iodide of potassium. A concentrated solution of it dissolves oxalate of lime.

Ailanthate of Lime.—In this form ailanthic acid exists in nature. It is soluble in water, forming a pale orange-coloured solution, which is very bitter. Oxalic acid and oxalate of ammonia separate the lime from combination. It can be dried into a hard, solid, reddish-brown mass, which, when exposed to air, attracts moisture, but less quickly than the pure acid, and is less sticky to the feel. When drying, it swells much more than the pure acid. Its taste is not so bitter as that of the pure acid; it dissolves freely in water, and is uncrystallizable.

Ailanthate of Lead.—This compound is formed during the preparation of ailanthic acid. It is of an ochre-yellow colour when fresh, but changing to a darker red when kept. When hot and dry, it is hard and brittle like

* In this process ailanthic acid still retains a small percentage of uncrystallizable sugar, which is difficult of removal.

resin; but when cool and kept for some time, even in an air-tight bottle, it gets sticky and soft. While hot and soft it can be moulded into any shape like wax or gutta-percha, and can be drawn into silk-like fibres, which, on cooling, become soft and glutinous. The freshly-dried salt can be easily powdered, a property not observed in other compounds of this acid. The powder, if inhaled through the nose, excites sneezing; it readily attracts moisture when cool: sulphuric acid or sulphuretted hydrogen removes the lead, and leaves the acid free. Its taste is as bitter as that of the free acid. It is freely soluble in water, and is uncrystallizable.

(*To be continued.*)

Parliamentary and Law Proceedings.

ALLEGED POISONING OF SHEEP BY DIPPING COMPOSITION—ACTION AGAINST A CHEMIST.

SUFFOLK SUMMER ASSIZES, BURY ST. EDMUNDS.

NISI PRIUS COURT, 12*th August*, 1870.

Smith *v.* Barker.

Mr. O'Malley, Q.C., and Mr. Mayd, appeared for the plaintiff; Mr. Bulwer, with whom was Mr. Naylor, for the defendant.

It appeared from the evidence given in this case that the arsenical solution was sold with printed instructions, in which it was stated to be "poison;" that every gallon of the composition was to be mixed with forty gallons of water, and that this quantity was sufficient for two scores of sheep. Further directions were also given to squeeze out the liquor from the wool of the sheep after they had been dipped. The plaintiff's men appear, however, to have used four gallons and five quarts of the composition for five score sheep, and to have hurried the operation of dipping, so that the liquor was not sufficiently squeezed out of the sheep's wool. Consequently arsenic was absorbed and several of the sheep died. Several witnesses gave evidence that the composition could be used without danger if properly diluted and if the instructions were carried out; while others testified to having used it for hundreds of sheep without any injury to them.

The declaration alleged that the defendant did not use due care and skill as a chemist in preparing a certain composition to destroy lice in sheep, which composition was to be used according to certain directions, that the plaintiff used this composition with due care; nevertheless the solution was so badly compounded that a number of his sheep were killed and others injured.

The judge, in summing up the case, said the plaintiff complained that the defendant had not used due and proper care and skill as a chemist, in preparing the composition which was to be used according to certain directions delivered by the defendant to the plaintiff at the time of selling. This was the real question which the jury had to try. The counsel for the plaintiff was in error in supposing it was the business of the defendant to satisfy them that the plaintiff was negligent. The onus or burden of proof was the other way, because the plaintiff complained defendant did not use due and proper skill, and that his mixture could not be used with reasonable safety according to the directions. Certainly in these instructions there was the most distinct notice that could possibly be given in writing and print as to the poisonous nature of this solution, because there were the words "Poison" "Poison." Then again nothing could be more precise than the directions given as to the use of this dangerous mixture, and he presumed the jury would be of opinion that it behoved every one who used it to be careful about it. On the present occasion there was no doubt that the death of Mr. Smith's sheep was caused by the absorption of the liquid into the system of the sheep. They might take it as a fact that the plaintiff had proved the death of his sheep was occasioned by absorption into the system of this chemical solution. How was that caused? Was it caused by the solution itself being defectively prepared? If it was then the defendant was liable, if it was not the defendant could not be liable. That the solution as prepared by Mr. Barker, if the directions were followed, was a harmless one, there seemed to be no doubt. The defendant said that for nineteen years he had been in the habit of preparing the solution, and that it had been very extensively used on thousands and thousands of sheep. Was the negligence or want of care on the part of the defendant, or on the part of the plaintiff? One question was important, namely, how did the $4\frac{1}{2}$ gallon bottle, together with the quart added to it from the first bottle become so nearly exhausted with the dipping of 100 sheep? If they were satisfied that the defendant did not use proper care in making the preparation, and that the death of the sheep was occasioned thereby, the plaintiff would be entitled to their verdict; if on the other hand they were of opinion that the death of the sheep was not caused by the want of proper care and skill on the part of the defendant, then the defendant would be entitled to a verdict in his favour.

The jury then consulted for about twenty minutes, and without leaving the box returned a verdict for the defendant.

CENTRAL CRIMINAL COURT.

August 15.

George Gorfenkle, chemist, pleaded "Guilty" to obtaining, by false pretences, goods of considerable value from Messrs. Maw and Son, instrument makers, Aldersgate Street, and Messrs. Huxley and Co., cigar merchants, Whitechapel Road. He was sentenced to twelve months' imprisonment.

[*** This report is taken from the 'Times' of the 16th inst. There is no such name on the Register of Chemists and Druggists as that of George Gorfenkle.—ED. PH. J.]

A NEW ANTIPERIODIC.

Dr. Lorinser, of Vienna, gives the results of a number of observations made regarding the effect of a new remedy for intermittent fever. The remedy is the tincture of the leaves of the *Eucalyptus globulus*, a plant of the natural order *Myrtaceæ*. In 1869, Dr. Lorinser made some experiments, the results of which he published; but he was brought to a standstill by the want of a supply of the medicine. The plant has since been cultivated by Herr Lamatsch, an apothecary; and a sufficient quantity of tincture has been made from the leaves to supply a number of medical men in the districts of the Theiss and Danube, and in the Banat. The records of fifty-three cases of intermittent fever in which the eucalyptus was administered have been communicated to Dr. Lorinser; and he gives very brief outlines of each, with the following summary of the results obtained. Of the fifty-three patients, forty-three were completely cured; in five, there was relapse in consequence of a failure of the supply of the tincture of eucalyptus, and quinine had to be employed; two of the cases were not true ague; in one case, neither the eucalyptus nor quinine cured; in one, the medicine (as well as other remedies) was vomited; and in one, the patient would not allow the treatment to be continued. In eleven of the cases, quinine had been used without effect; and nine of these were cured by the eucalyptus. There was return of the fever in ten cases, at intervals varying from one to four weeks; in five of these quinine had to be used, in consequence of there being no tincture of eucalyptus, and in the other five the eucalyptus was successfully employed. The tincture is said to be easily made, and to have a pleasant aromatic taste; it acts favourably on the digestive organs. Dr.

Lorinser believes that in it we have a valuable remedy for intermittent fever. It may be so; but, considering the comparative failure of the substances which have hitherto been recommended as substitutes for cinchona and quinine, still more extended and careful observation will be necessary before recognizing the claims of the *Eucalyptus globulus* to rank as an antiperiodic on which dependence can be placed. The districts which Dr. Lorinser has chosen for testing the effect of the remedy are, we believe, well fitted for the purpose—intermittent fever being very prevalent in them.—*Philadelphia Medical and Surgical Reporter.*

CHINESE THERAPEUTICS.

The Chinese divide medicinal substances into heating, cooling, refreshing, and temperate. Their materia medica is contained in the work called the *Pen-taoscang-mou*, in fifty-two large volumes, with an atlas of plates. Most of our medicines are known to them and prescribed, also mineral waters, with which the country abounds. They also have animal magnetizers, called *cong-mou.*

They divide their prescriptions into seven categories, viz.:—1st. The great prescription. 2nd. The little prescription. 3rd. The slow prescription. 4th. Prompt or through-by-daylight prescription. 5th. The old prescription, for fools, madmen, hypochondriacs, and the hysterical. 6th. The even prescription, for the wise and good. 7th. The double prescription, for those in the family way.

Each of these recipes is applied to particular cases, and the ingredients that compose them are weighed out with the most scrupulous accuracy.

The physician never pays a second visit unless sent for, and sometimes his services are no longer needed.—*Philadelphia Medical and Surgical Reporter.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Acidum Nitro-hydrochloricum Dilutum.—[§. Take of—

Nitric acid	3 fluid ounces
Hydrochloric acid . .	4 fluid ounces:

Mix the acids, and allow them to remain for twenty-four hours in a bottle, the mouth of which is partially closed, then add the water in successive portions, shaking the bottle after each addition, and preserve the mixture in a stoppered bottle.]

The reaction which the two acids enter into gives rise to the production of a good deal of gas.

$$2HNO_3 + 6HCl = \underset{\text{Chloronitric gas.}}{N_2O_2Cl_4} + 4H_2O + Cl_2.$$

And also simultaneously,

$$2HNO_3 + 6HCl = \underset{\text{Chloronitrous gas.}}{N_2O_2Cl_2} + 4H_2O + 2Cl_2.$$

Such a mixture is called aqua regia; it has the property of dissolving gold, from the presence of free chlorine. In the preparation of the dilute acid for pharmaceutical use the best apparatus consists of two Winchester quarts, connected by a piece of flexible tubing. One contains the two acids, the other the water; gases evolved from the acids are thus collected in the same water with which they are afterwards to be mixed.

There is no advantage in the official process over the plan of mixing the acids with the water immediately; for after dilution, the elements rearrange themselves so as to reproduce nitric and hydrochloric acids. This occurs more perfectly the larger the proportion of water added: the less water, the larger will be the amount of nitrous acid and chlorine remaining.*

Acidum Phosphoricum Dilutum.—Phosphorus is digested with diluted nitric acid till dissolved: the solution is then evaporated to expel the excess of nitric acid and complete the oxidation to phosphor-*ic* acid, and it is then diluted to the proper strength. The reaction which occurs will be understood after studying "nitric acid."

$$20HNO_3 + 3P_4 + 8H_2O = 12H_3PO_4 + 20NO.$$

With ammonio-nitrate of silver, phosphoric acid gives a yellow precip. of Ag_3PO_4. Evaporated to complete dryness, it leaves a residue (glacial phosphoric acid) consisting chiefly of metaphosphoric acid.

$$H_3PO_4 = HPO_3 + H_2O.$$

Phosphoric acid is a most important example of a tribasic acid. With each metal it forms three distinct salts, in which one, two, or three atoms of the metal replace an equivalent quantity of the hydrogen of the acid. It is also capable of forming other double or triple salts. The following are some examples:—

Phosphates of Sodium.

Monosodic	NaH_2PO_4
Disodic	Na_2HPO_4 (B.P.)
Trisodic	Na_3PO_4.

Phosphates of Calcium.

Monocalcic .	$Ca''H_4 2PO_4$ ("superphosphate")
Dicalcic . .	$Ca''_2H_2 2PO_4$, or $CaHPO_4$
Tricalcic . .	$Ca''_3 2PO_4$ (bone-ash).

Ammoniæ Phosphas, B.P., or diammonic phosphate.

$$(NH_4)_2HPO_4.$$

If the first phosphate of soda is heated to redness, the residue is metaphosphate of sodium.

$$NaH_2PO_4 = NaPO_3 + H_2O.$$

The second one by heat gives the sodium salt of pyrophosphoric acid.

$$2(Na_2HPO_4) = Na_4P_2O_7 + H_2O.$$

These three acids of phosphorus are thus distinguished from each other.

a. Common, tribasic, or orthophosphoric acid, when neutralized, and its soluble salts give a yellow precipitate with nitrate of silver.

b. Pyrophosphoric acid does not coagulate albumen, and with nitrate of silver gives a chalky-white precipitate only after being neutralized by an alkali.

c. Metaphosphoric acid coagulates albumen, and gives, with nitrate of silver, a transparent white precipitate without neutralization.

The impurities indicated by the tests of the Pharmacopœia are as follows:—Metals, such as *copper*, *arsenic*, or *lead*, by sulphuretted hydrogen; *sulphuric acid* by chloride of barium; *hydrochloric* acid by acidified nitrate of silver; *metaphosphoric* acid by solution of albumen; *nitric* acid by darkening a

* See Pharm. Journ., N.S., Vol. X. p. 580.

solution of sulphate of iron; *phosphorous* acid (the result of imperfect oxidation) by heating with perchloride of mercury. In the last test, calomel or metallic mercury may be precipitated.

$$H_3PO_3 + OH_2 + 2\,Cl_2Hg = H_3PO_4 + 2HCl + Hg_2Cl_2.$$

Or,—

$$H_3PO_3 + OH_2 + Cl_2Hg = H_3PO_4 + 2HCl + Hg.$$

355 grains of the B.P. acid evaporated to dryness with 180 grains of oxide of lead, and heated to dull redness, increase the weight of the residue to 215·5 grains.

Oxide of lead.		P_2O_5.		Oxide + phosphate of lead.
180	+	35·5	=	215·5

Six fluid drachms (354·375 grains) therefore contain 35·5 grains of P_2O_5 (10 per cent.), or 49 grains of H_3PO_4.

Medical Arrangements in the French Army.—The Paris correspondent of the 'Lancet' writes, "A cause of complaint has been the curious medical *cantine* given to the regimental surgeons. It consists of a box, which, when opened, contains only one solitary phial, filled with calomel; it holds no sulphate of soda, no subacetate of lead—in fact, none of the most ordinary medicaments required for the sick or wounded soldier. Besides this, it consists of an extraordinary number of small drawers, which, on any dampness supervening, would render the *cantine* unfit for use. The presence of a large number of pharmaciens on the field, in comparison with the limited number of medical men, has also given rise to much criticism, and it is asked of what earthly use will be so large a number of pharmaciens, unless to 'help to make the soldier's soup.'

"The fact is, that the number of medical men attached to the ambulances is absurdly limited. It has been related to me by French army surgeons that after Magenta their arms had become deadened from operating, and their instruments useless, while there were yet a large number of the French wounded unprovided for, not to mention at least 1500 Austrians. And yet the number remains as limited in this campaign. How this can be is a mystery.

"Each division of the army includes one ambulance; and as there are four divisions to a *corps d'armée* the total number is four ambulances, to which, however, must be added a fifth attached to the head quarters of the *special corps*. Now each ambulance consists only of five surgeons, making a total of twenty-five surgeons to a division. Obviously this number must be altogether below the requirements of the service, especially during the present campaign, when such energetic and rapid movements are necessary, and when the wounds that are inflicted are so numerous, and of a special character on account of the arms in use. Therefore, the help afforded by the volunteer ambulances must prove invaluable under existing circumstances."

Liverpool and its Health Officer.—The Town Council have rejected, by 18 votes to 16 on a division, the Report of the Health Committee, which proposed to put a check upon the medical officer of health in regard to the conversion of cesspools into waterclosets. This has led to the resignation, by Mr. Alderman Dover, of the chairmanship of the Health Committee, that gentleman having apparently been led by strong economic tendencies to oppose the principle on which Dr. Trench has acted, as leading to unnecessary expenditure. It is, of course, matter for regret that the Council should lose the valuable services of so able and energetic a man as the worthy alderman; but we are quite sure that they have done wisely in supporting their medical officer of health, who cannot possibly desire to put his fellow-townsmen to needless expense. Whoever has studied the proceedings of Dr. Trench since he has been health officer for Liverpool must have been led to the conclusion that his policy throughout has been based on the soundest principles of economy.—*Lancet.*

How to Drive away Mosquitoes.—One of the greatest plagues of hot countries is the mosquito, and various have been the means recommended for getting rid of this pest. Jagor, a celebrated German traveller, who spent a number of years in the jungles of the Malayan Archipelago, recommended, if we remember rightly, the roots of *Pyrethrum roseum.* In a paper recently published by Dr. Birdwood on olibanum, the author says that in Bombay nothing so quickly clears one's bed of mosquitoes as the burning of a little olibanum or myrrh in it. The Protestant churches there are infested by mosquitoes, as by a plague. He was often asked how to get rid of them, and always answered that while the ugly and irreverent punkahs were of no use, the only remedy was the immemorial and most beautiful rite of burning frankincense.

Convention of Colleges of Pharmacy.—At a stated meeting of the Maryland College of Pharmacy, the following resolution was unanimously adopted:—

"*Resolved*, That a Committee of five be appointed to request the several Pharmaceutical Associations of the United States to send Delegates to a Convention, proposed to be held in the City of Baltimore in September next, at the time of the meeting of the American Pharmaceutical Association."

The purpose being to consult and determine upon the best uniform course of study for those learning the profession of pharmacy, and to recommend the same for adoption in the schools of the several associations they represent, to the end that there may be a uniform standard of qualification for all graduating in pharmacy.—*The Chicago Pharmacist.*

Substitute for Lint.—Mr. H. Pownall, late chairman of the Middlesex Sessions, submitted to Lord Lindsay's committee a sample of very fine picked oakum, which has been used in some of the London hospitals as a substitute for lint in dressing wounds. Should this substitute prove as useful as represented, the inmates of unions and prisons might be advantageously employed in its preparation. It would be not only remunerative, but a means of turning the labour of the pauper to a highly beneficial purpose.—*Standard.*

Inefficacy of Immature Cantharides.—Recent investigation shows that young cantharides do not possess the epispastic property, and it would seem that in medium-sized insects it is equally wanting. It is only the full-grown insects that will raise blisters. Cantharidine appears not to be developed until the complete maturity of the insect. In purchasing cantharides, therefore, those only should be chosen which have attained their full growth.—*Zeitschrift für Chemie.*

Poisoning by a Salt of Copper.—A serious case of poisoning has occurred at Geneva. Six workmen, two hours after dining at their usual place of resort, were seized with violent pains in the stomach, followed by vomiting. A doctor having been called in, he recognized immediately the symptoms of violent poisoning. The men were carried to the hospital, where, in spite of every attention, three of them died after some hours of severe suffering.

Upon the police officer going to the house where they had dined, he found the proprietor, his wife and child, and a domestic dangerously ill; the man and his wife dying the same evening. At the inquest it was found that the mishap was due to the negligence of a servant, who had prepared the soup in a copper utensil, at the bottom of which was a large quantity of verdigris.—*Journal de Chimie Médicale.*

Health of the Armies on the Rhine.—Besides the dreadful death-roll of slain and wounded, we may soon expect to hear of disease causing ravages in the ranks of the hostile legions. Dysentery is commonly prevalent in the Rhine provinces of France and Prussia, as well as in Belgium, during July and August. The favourite treatment just now among French surgeons is bismuth in full doses. Ipecacuanha seems to have failed with the medical men on the borders of the Rhine. If the war be not suddenly concluded, intermittent fever will probably in about a month from this time be epidemic. It is almost sure to be of a very low type. Then these fevers will assume a remittent form, and true camp fever will become established. It is not improbable that cases of typhus will also occur in numbers to cause anxiety, though other forms of fever will probably be most prevalent. We are, of course, presupposing that every hygienic precaution will be adopted, for neglect of any would be sure to give rise to proportionate loss. We speak only of what is to be expected under most favourable circumstances. As autumn advances the weather will become a more potent element,—rheumatic affections and diseases of the lungs then taking the lead. At present the one question is whether the camp will be exposed to heavy rains.—*Medical Press and Circular.*

BOOK RECEIVED.

An Elementary Course of Botany, Structural, Physiological, and Systematic. By the late Professor Henfrey. Second Edition; revised and in part rewritten by Dr. Maxwell T. Masters. London: Van Voorst, Paternoster Row, 1870.

Obituary.

Mr. J. T. Porter, whose death we reported last week, was one of the most promising of recent students of the Pharmaceutical Society. About five years ago he entered the School of Pharmacy under somewhat interesting circumstances. The gentleman with whom he was apprenticed, Mr. Sutterby, of Long Sutton, Lincolnshire, was in the habit of giving his pupils a fortnight's holiday every summer. Mr. Porter, with the consent of his employer, denied himself the pleasure of the holiday on one occasion, in order that the next year he might devote a whole month to continuous study. Having, meanwhile, saved enough money to pay expenses, he travelled up to London, and spent that month in the Laboratory at Bloomsbury Square. This energy in seeking culture under great difficulties was sure to meet with success. It obtained for Mr. Porter friends, who enabled him, on completing his apprenticeship, again to work in the Society's Laboratory, this time for three months. He subsequently became private assistant to the Professor of Practical Chemistry, afterwards filled the position of under-manager in the laboratory of Messrs. Bell and Co., and ultimately was appointed chemist to the Hastings Sewage Works, where, in the full career of successful labour, and while actually attempting to save the lives of others, he suddenly met with his death.

Mr. Porter was a steady worker in the cause of natural and revealed truth. He published several original researches on matters connected with pharmacy, and was Secretary of the London Chemists' Association.

We are indebted to correspondents for the following periodicals, containing news' reports, and other matters of pharmaceutical interest:—The 'Newcastle Daily Chronicle,' Aug. 11, 12, 13, and 15, from Mr. H. B. Brady; the 'Essex and Suffolk News,' Aug. 13, from Mr. Barker; 'Allen's Indian Mail,' Aug. 9, from Dr. Cleghorn; the 'British Medical Journal,' from the publishers; the 'English Mechanic,' from the publishers; the 'Philadelphia Medical and Surgical Reporter,' May 21, June 11, 18 and 25, from the publishers.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

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

State Aid for Pharmaceutical Education.

Sir,—I think the result of the following correspondence is of sufficient importance to justify my requesting you to give it a place in the text of your next number.

I am, Sir, your obedient servant,

Clifton, August 14, 1870. G. F. Schacht.

"*To the Secretary, Science and Art Department.*

"Sir,—As Hon. Secretary of the Bristol Pharmaceutical Association, I beg leave to ask you for information on a point of some importance to this and similar organizations.

"Our Association has for its principal object the education of our apprentices and assistants in the sciences applied to their profession, a fair knowledge of which a recent Act of Parliament has made obligatory upon every one who now enters the practice of pharmacy.

"In Bristol we have calculated upon the aid of your department, but in other localities it has been thought that the regulations do not warrant this course, inasmuch as the fathers of some apprentices pay income-tax.

"An apprentice to a pharmaceutist is boarded, lodged, and taught his profession in return for his services, to which is generally added a premium. He may, therefore, be looked upon as having taken leave of home.

"The apprentice, in due time, becomes an assistant, and it would be difficult to find an assistant whose salary reaches the minimum amount assessed.

"Under these circumstances, we have thought that the department might be disposed to aid the spread of this movement to other cities, by the official announcement—that they will consider pharmaceutists' apprentices and assistants as coming within the scope of paragraph xxxvi, clause (C), page 13 of the 'Directory,' which awards premiums upon 'Persons in the receipt of salaries not large enough to render them liable to the income-tax, as some descriptions of clerks, shopmen, etc.'

"I have the honour to be, Sir,
"Your obedient servant,
"G. F. Schacht,
"*Hon. Sec. Bristol Pharmaceutical Association.*
"*Clifton, July* 30, 1870."

"*Science and Art Department, London, W.*
"*August 3rd*, 1870.

"Sir,—I am directed to acknowledge the receipt of your letter of the 30th ultimo, respecting the payment on the results of the examination of pharmaceutical apprentices and assistants, and to inform you that the subject will be considered.

"I am, Sir,
"Your obedient servant,
"Norman M'Leod,
"*G. F. Schacht, Esq.*" "*Assistant Secretary.*

"*Science and Art Department, London, W.*
"*August 11th*, 1870.

"Sir,—In reply to your letter of the 30th ultimo, I am directed by the Lords of the Committee of Council on Education to inform you that, under the circumstances set forth by you, their Lordships have been pleased to allow payments to be made on the result of the examination of pharmaceutical apprentices and assistants in science.

"I am, Sir,
"Your obedient servant,
"G. F. Duncombe, *Chief Clerk.*
"*G. F. Schacht, Esq.*"

Safeguards against Poisoning.

Sir,—A respected correspondent suggests the use of elastic gum capsules as a safeguard against poisoning.

I beg to suggest that, however well the secondary object (namely, to prevent evaporation of ethereal and spirituous liquids) might thus be attained, it would be impossible to obviate the accidental displacement of a capsule, thus causing uncertainty and confusion.

Many years since, I had the honour of suggesting a very simple expedient, which, during a long experience, has been found truly effective. It is merely to place the labels of dangerous poisons perpendicularly on the bottle instead of in the usual manner, which, in some instances, prevents half the inscription being read. Having adopted this plan in my shop for very many years, without the occurrence of a single accident, I venture to recommend it to my brother pharmacists. The appearance of certain bottles thus distinguished from their fellows frequently calls forth the notice of intelligent persons, both medical and otherwise, thus tr. opii and mist. sennæ co., tr. aconiti and tr. myrrhæ, acid. arseniosum and p. antim. co., stand side by side, in perfect safety. Like the red light upon the railway, everybody knows the signal of danger and respects it accordingly.

I remain, yours faithfully,

P. Goodwin Mumbray.

14 A, *Hill Rise, Richmond, S.W.*

August 10, 1870.

Our Responsibilities.

Sir,—No further information appears in the last number of the Journal respecting the case of "Damages against a Druggist," at Liverpool, reported and commented on in previous number. If we are to be exposed to actions and convicted on such flimsy evidence as appears to have been relied on in that case, then ours is a most unenviable position. If the defendant does not appeal against what appears to be a miscarriage of justice, do not the common interests of the trade require that the case should be further investigated? One such case successfully prosecuted will lead to others, and we shall soon be having every old lady who may take a dose of castor oil, and "feel sick after it," wishing to try the effect of the very comforting antidotes they administer so freely at the "Court of Passage," in Liverpool.

By the way, the case goes to show that sal volatile and liq. potassæ must find their place in the poison-cupboard,—that *very comprehensive* receptacle "set apart for dangerous articles."

I am, etc.,

London, August 9, 1870. George Pattison.

[*** We are informed by the Local Secretary for Liverpool, that the bottles in Mr. Trilfield's shop are well-labelled, the bottle for the Aq. Cinnam. has a good gold label, and that for the Liq. Potassæ is one of a series with labels engraved in the glass.—Ed. Ph. J.]

"Rule of Thumb."

Sir,—May I again trespass on your space with a few words in reply to "J. Houlton"?

He asserts that there is more "cry than wool" in the letters published on the above subject. I think not. I cannot see why a grain of calomel is not to be weighed equally with ʒij of magnesia. Measurement being an accurate mode of dispensing, while guessing is inaccurate, the public will certainly have little confidence in any hap-hazard method of preparing medicines. I still contend that it is the imperative duty of the pharmacist in all cases to rely upon his scales rather than his eye.

As to "Trade Grievances," there seems really to be "much ado about nothing." The plain fact is that pharmacy, pure and simple, will not afford a living to the country pharmacist, and consequently he must of dire necessity become a general dealer in perfumery, oils and colours, articles of grocery, etc., so as, by hook or by crook, to earn enough to keep body and soul together. At present pharmacy is a profession that does not afford professional remuneration to many of those engaged in it, who thus resemble poor noblemen, who, with all the distinction afforded by titles, lack the fortune to support them.

Yours, etc.,

August 16*th*, 1870. Minor Associate.

"Pharmaceutical Titles."

Sir,—It has for some time been matter of surprise to me that so little attention has been drawn to the subject of "Pharmaceutical Titles."

I allude to the different degrees of honour contained in the names of "Pharmaceutical Chemist," "Chemist and Druggist," etc., adopted by those to whom these names belong either by examination or by registration.

My surprise is excited by the little notice taken of encroachments on the advantages attaching to the *higher distinction* made by those who, having never passed the "*Major*" Examination of the Society, cannot claim the privilege of calling themselves "Pharmaceutical Chemists," but nevertheless resort to means by which they may mystify the public (who are, in this matter, only half taught), and so prevent their recognizing a difference between the man who passes a *high scientific* Examination (as the Major) and one who merely "*goes in*" for the "Modified."

I do not say that those who thus make the most of their attainments do anything which is not strictly legitimate, for they surely have a perfect right to take advantage of their position as far as it will go.

But the grievance lies in the fact that *their privileges* are too nearly identical with those of their more distinguished brethren.

Who (that is not connected with the business) could understand the difference between "Pharmaceutical Chemist" and "Chemist by Examination of the Pharmaceutical Society"? and I find the latter term, to *which they have a perfect right*, is coming into use amongst those who have passed the "Minor" or "Modified" Examinations.

Now, Sir, is it fair to him who works hard to succeed in the three Examinations of the Society, paying a considerable sum as fees, besides numerous other expenses, to let another who "gets through" what is generally acknowledged to be a VERY "*modified*" form of questioning, reap equal advantage, so far as public opinion goes?

I am glad to see that the matter has already been started in the Journal by others, who think, as myself, that this subject should no longer be neglected. I would strongly counsel the adoption of the title "Fellow of the Pharmaceutical Society," for indicating the great distinction between "Major" and "Minor" Associates, and think this would—to a great extent, at least—meet the wants and desires of the great body of the former, and also of those who aspire to attaining eventually "the top of the tree."

I would wish to add "one word" to those who are desirous, with me, of this amendment in the laws of the Society, and that is "agitate," and so try to induce those in whom the power of alteration lies to consider the best means of conferring upon such a large portion of the members of the body this great desideratum.

Hoping this subject will not now be allowed to drop and pass into oblivion,

I am, Sir, yours obediently,

An Aspirant to the Major.

Evaporation in vacuo *without an Air-pump.*—A correspondent has reminded us that the method recommended by Mr. A. B. Prescott, as quoted in the Pharm. Journ. for August 6, is identical in principle, and the arrangement of the apparatus essentially similar, to that described by the late Mr. J. T. Barry in the *Medico-Chirurgical Transactions*, vol. x. (1819) part 1.—See also Pharm. Journ. Vol. VI. (1865), 30.

"*A Minor Associate.*"—Questions are sometimes put to test the candidate's powers of "guessing."

"*Quæsitor.*"—See Vol. V. N. S. pp. 408 and 462. The Editor of the last edition seems to think the presence of a little free carbonic acid gas an advantage. As a *domestic* remedy, we think the public prefer the flavour of that made with the carbonate.

"*Inquirer*" (Farnham).—We should use the B. P. fluid extract unless "*Battley's*" name were mentioned. Many London prescribers of the present day prefer the term "liquor" for bark, taraxacum, sarsaparilla, etc., as being shorter to write, and less liable to the possibility of confusion with the old extracts.

Arthur Bolas (Birmingham).—Yes, if the excess of nitric acid used in preparing the "liquor" be not driven off. See Squire's 'Companion to the Pharmacopœia,' p. 121.

S. L., M.P.S. (Horton) will find that the formula he requires has been already given in the 'Pharmaceutical Journal,' O. S. Vol. XVIII. p. 579.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

GOLD THREAD.

Coptis teeta, Wall., and *Coptis trifolia*, Salisb.

BY M. C. COOKE.

Two species of *Coptis* are collected and employed in Asia and North America respectively, for similar purposes and with like results. The Asiatic species is the Mishmi Tita of Assam, included as a primary article in the Pharmacopœia of India; the *Coptis teeta* of Wallich, a native of the Mishmee mountains, east of Assam. The officinal part is the dried root imported into Bengal from Assam in small rattan baskets, each containing from one to two ounces of the drug. This consists of pieces of a woody rhizome, of the thickness of a small goose-quill, and from one to two inches in length, often contracted at one extremity into a short woody stem; the surface is usually rough, irregular, more or less annulated, and marked with the remains of rootlets in the shape of short spiny points. Externally it is of a yellowish-brown colour, internally much brighter, frequently of a golden-yellow colour, exhibiting on fracture a radiated structure. Taste persistently bitter, and when chewed tinges the saliva yellow. It contains neither tannic nor gallic acid, but abounds with a yellow bitter principle, soluble in water and alcohol.[*]

This drug was first brought into notice by Dr. Wallich in 1836,[†] and was reported upon by Mr. Twining. The late Dr. J. E. Stocks, in his collection of drugs from Scinde, described in the 'PHARMACEUTICAL JOURNAL' (Vol. XIV. p. 456), sent a root called 'Mahmira,' and Dr. Pereira published an elaborate paper on it,[‡] in which he endeavoured to show that this was the root termed 'Mahmira' in the writings of Avicenna, Paulus Ægineta, and other old authors. Dr. Waring at one time doubted whether this might not be more correctly referred to *Thalictrum foliolosum*, DC., which has also a bitter yellow root, but he has since accepted Dr. Pereira's views.

According to the same authority, the *Coptis* root has long been known in Europe under other names. In Guibourt's Hist. Nat. des Drogues it occurs under the name of 'Racine de Chynlen ou de Mangouate.' It is also described by Murray under the name of 'Chynlen;' and it is mentioned by Ainslie with the name of 'Sou-line' or 'Chyn-len,' and he says it is a bitter root which is brought from China to India.

It was used extensively at the Calcutta General Hospital by Mr. Twining, who reported that its influence in restoring appetite and increasing the digestive powers was very remarkable, and that it might be said to possess all the properties of our best bitter tonics. It did not seem to exercise any febrifuge virtue, but, under its influence, several patients, recovering from acute diseases, manifestly and very rapidly improved in strength. The dose was five to ten grains of the powder, or an ounce of the infusion, thrice daily. The Bengal Pharmacopœia contains the following formula for the tincture:—Mishmee teeta root, powdered, ℥iij, proof spirit lb. ij; dose ʒi to ʒij. O'Shaughnessy states that in its chemical properties it corresponds exactly with the American species. Both contain *Berberina*. For an account of its virtues as a tonic, the following authorities may be consulted:—Wallich and Twining,[*] O'Shaughnessy,[†] Macpherson,[‡] and Captain Lowther.[§]

The American Gold thread is *Coptis trifolia*, Salisb. It inhabits the northern regions of America and Asia, and is found in Greenland and Iceland. It delights in the dark shady swamps and cold morasses of northern latitudes and alpine regions, and abounds in Canada and the hilly districts of New England. All parts of the plant are more or less bitter, but this property is most intense in the root, which is the officinal part. It is a primary article of the United States Pharmacopœia.

"Dried Gold thread, as brought into the market, is in loosely matted masses, consisting of the long thread-like orange-yellow roots, frequently interlaced and mingled with the leaves and stems of the plant. It is without smell and has a purely bitter taste, unattended with aroma or astringency. It imparts a bitterness and yellow colour to water and alcohol, but most perfectly to the latter, with which it forms a bright yellow tincture. The infusion is precipitated by nitrate of silver and acetate of lead. It affords no evidence of containing ether, resin, gum, or tannin." [||]

According to Professor F. F. Mayer, this drug contains *Berberina*, as well as *Hydrastis canadensis*, associated with a colourless alkaloid, which is not precipitated by muriatic or nitric acid, but the precise nature of which does not yet appear to have been demonstrated.[**]

The properties and uses of this article are thus described by Dr. G. B. Wood. Gold thread is a simple tonic bitter, bearing a close resemblance to Quassia in its mode of action and applicable to all cases in which that medicine is prescribed, though, from its higher price, not likely to come into general use as a substitute. In New England it is employed as a local application in aphthous ulcerations of the mouth, but it probably has no other virtues in this complaint than such as are common to the simple bitters. It may be given in substance, infusion or tincture. The dose of the powder is from ten to thirty grains; of a tincture made with an ounce of the root to a pint of diluted alcohol, one fluid drachm.

Although differing considerably in external appearance, it will be seen that these two species of Gold thread have very much in common; but if the reports are to be fully relied upon, the Asiatic plant, *Coptis teeta*, certainly has the advantage in quality and recommendation. Does it not deserve a fair trial in this country?

* Pharmacopœia of India, p. 4.
† Trans. Med. and Phys. Soc., Calcutta, vol. viii. p. 85.
‡ Pharm. Journ. 1851, Vol. XI. p. 294.

* Trans. Med. and Phys. Soc., Calcutta, vol. viii. pp. 85–94.
† Bengal Dispens. p. 163.
‡ Ind. Ann. of Med. Sci. 1856, vol. iii. p. 397.
§ Journ. Agri-Hort. Soc. of India, 1858, vol. x. App. p. 6.
|| 'United States Dispensatory,' 12th ed. p. 326.
** Amer. Journ. Pharm., March 1863, p. 97.

THE SOURCE OF MUSCULAR POWER.

BY BARON LIEBIG.

As the result of general experience, I have formerly expressed the opinion that the source of the mechanical actions of the animal body must be sought in material metamorphosis, and especially in the transformation of the nitrogenous constituents of muscle. Accordingly, the work done by any two individuals should be proportionate to the respective mass of their muscles, while the duration of the work should be proportionate to the supply of material suitable for restoration of the transformed parts of the muscular mass.

The comprehensive and carefully conducted investigations of Playfair in reference to the requirements of various classes for albuminates in their daily food, appear to leave no doubt as to the correctness of this view. He demonstrated that everywhere and under all conditions, the labourer required, for the maintenance of working power and health, a larger amount of albuminates than was needed by an individual that no work. This is the case in prisons, in penitentiaries, and with soldiers both in war and in peace.

Moreover, the results of Playfair's investigations have not encountered any earnest opposition resulting from observations of equal value. Isolated observations have been urged against his conclusions; but I consider that these should be regarded with as much caution as the opinion popularly held in Bavaria, that beer is a good article of nutrition and that hard-working men owe their strength chiefly to the consumption of beer. Exact observation of the diet of the brewery labourers in Munich, who consume the largest amount of beer, shows, on the contrary, that these people are also the largest meat-eaters.*

The question as to the source of muscular power has been rendered confused by an inference that has proved to be erroneous, and for which I am myself accountable. If the muscular substance in undergoing metamorphosis be the source of muscular power and, if the ultimate nitrogenous product formed in this metamorphosis with the aid of oxygen be urea, then it would follow (it was erroneously inferred) that the work done might be deduced from the quantity of urea. It was assumed that the metamorphosis would be proportionate to the work done and that the urea secreted would be also proportionate to it.

The first facts ascertained in opposition to this view that urea was a measure of muscular work, were established by Dr. Bischoff in his investigation on urea as a measure of metamorphosis. Then followed the still more comprehensive investigation, undertaken by Bischoff and Voit in Munich, which may be regarded as a continuation of the experiments made at Giessen. It is probably unnecessary to mention here that I have always taken the liveliest interest in these investigations; indeed, the method devised by me for estimating urea owes its origin to them.

In these experiments a dog was fed with known quantities of meat and fat, with meat alone, with meat, carbohydrates and gelatin. At the same time the daily quantity of urea secreted was determined.

The quantity of nitrogen in the meat and the urine being known, it might be assumed in calculation that when the nitrogen in the urine was found to equal that in the meat consumed, the whole of the meat had been metamorphosed; if the quantity of urea was less, a portion of the meat consumed must have remained in the body or, in other words, must have been assimilated, while if the quantity of nitrogen was greater, the excess must have been furnished by parts of the body.

The following are among the most important results of these experiments:—

With a certain proportion of meat and fat, the animal experimented upon could be maintained at a constant weight. In this case all the nitrogen appeared as urea in the urine, and since there was no increase of weight, the fat must have been consumed in respiration.

It then became apparent that by increasing the supply of meat without increasing that of fat, the quantity of urea secreted became greater in the same proportion as the meat supply had been increased, while at the same time the weight of the animal increased.

In opposition to the opinion, then prevailing, that fat lessened the metamorphosis in the body—inasmuch as it appeared to be far more susceptible of oxidation than flesh—it followed from this experiment, on the contrary, that an excess of meat took the place of fat in the process of respiration. While, in the former case, the fat was entirely used up, it appeared that with more meat a part of this fat remained unaltered in the body.

This fact acquires high significance in a particular direction, inasmuch as it proves that there is in the animal body an arrangement by which increase of the blood or of constituents of blood beyond a certain limit is prevented. When albuminates are supplied in quantities greater than the body is in need of, they are removed in the most speedy way.

The particular causes that destroy this excess cannot, under normal conditions of nutrition, exercise any action upon the constituents of the blood; for, otherwise, in the case of deficient supply of food, or during abstinence, those constituents would be as much subject to the destructive influence of such causes, as if the excess of those constituents in the food had been acted upon.

It was further shown by Bischoff and Voit that the animal experimented upon could be sustained upon meat entirely destitute of fat and maintained at its full weight with very slight variations. In this case the secreted urea corresponded in quantity to the nitrogen of the meat consumed.

The constancy of the animal's weight indicated that fat may be entirely replaced by meat in the process of respiration; one part of the meat had undoubtedly served for generating heat, while another part served for the restoration of metamorphosed parts of the body.

But in both cases the nitrogenous product of the meat was the same, viz. urea.

However, if urea were a product not only of metamorphosis, but simultaneously also of respiration, then the quantity of urea secreted could not afford any indication as to the extent of the metamorphosis. If, moreover, the muscular work were determined by the metamorphosis, the amount of work could not be measured by the urea secreted. The view previously held could only be maintained if it could be shown that the work done by the animal was augmented in proportion as the supply of meat was increased.

In this case it must have been assumed that the meat was converted into muscle, that this muscle was metamorphosed, and that the products of this metamorphosis had served as material for generating heat.

* In the brewery of Sedlmayer, at Munich, 95 workmen, six women, and nine children, in all 112 persons, consumed 11,189 kilog. bread, 17,870 kilog. meat, and 159,120 litres of beer from the 1st October to the 30th April. Reckoning the 6 women and 9 children as equal to 9 men, the daily quantity of meat consumed per head would be 810 grm. The work of the brewery labourers is the most severe of any, and only very strong men are fit for it.

However, in certain cases the animal produced ten times as much urea as in normal feeding, without there being any recognizable outward sign of increased internal work.

From the view that the metamorphosis of nitrogenous constituents of the body gives rise to the working power, while the urea secreted is a measure of the metamorphosis, it would necessarily follow that the metamorphosis must be augmented by increased outward work and that this must also increase the quantity of urea secreted within a given time.

These considerations led Voit to institute the experiments by which he showed that, with a given diet, the quantity of urea secreted was the same during both rest and work.

This investigation consequently demonstrated that though urea was indeed a measure of the nitrogenous constituents supplied in the food and of those metamorphosed in the body, still it could not be taken as a measure of the work done by the body. An increase of the work did not appear to have any influence in augmenting the quantity of urea secreted.

However, in reflecting on these facts, one perceives at once that this could not be otherwise, for if the metamorphosis of muscular substance were increased by work, a man would be able to use up his entire store of muscle, since the performance of work is subject to the will. But the work done by the muscles must have a limit; beyond a certain point exhaustion is produced. The cases in which animals are killed by excessive work requires a special explanation.

Muscular force arises from a process that takes place in the muscles; so much of them may be consumed for producing work as is available for that purpose, but no more. The application of the available force may perhaps, for a time, accelerate those processes in the muscle by which it is generated; but the work done is not the cause of the metamorphosis.

There is no doubt as to the origin of muscular force, or that its seat is in the muscles themselves; neither is it doubted that it arises from some material alteration or metamorphosis of the muscular substance; but opinions still differ as to the process and as to the substances that undergo the change.

According to one view the force is generated by transformation of the nitrogenous constituents of muscle, in which oxygen takes part, though without directly causing it.

According to the other view, on the contrary, the force is generated by combustion, either of the non-nitrogenous constituents of the muscles themselves or of the non-nitrogenous constituents of the blood flowing through the muscles.

The capability of muscular material to produce muscular work cannot be doubted.

A carnivorous animal can be sustained in good health with meat alone and without any non-nitrogenous material. In this case the internal work and heat must be produced by the transformation of flesh.

No fact of equal significance can be brought forward to indicate the capability of fat or the so-called carbo-hydrates to generate the working force by their combustion.

An animal cannot be sustained by feeding with fat and carbo-hydrates alone; a certain quantity of albuminates of muscular material is always necessary. Moreover the work done does not bear any relation to the non-nitrogenous materials of the food consumed; it cannot be increased by a larger supply of them; it is not lessened by reducing the supply of them, when the quantity requisite for generating heat is made up by an equivalent quantity of nitrogenous material.

On the contrary the most every-day experience seems to show that the power of an individual to do work is, under otherwise normal conditions of diet, in a certain ratio to the quantity of muscular material consumed in his daily food, or to the quantity of material adapted for the production of muscle; that the supply of such constituents of the food must be increased as the work to be done is increased, so that a working individual requires more of them in his food than one who is at rest. Moreover this is the case not only from one day to another or during a few days; but during a month or a year.

(*To be continued.*)

FRANKINCENSE, OR OLIBANUM.*

The following is an abstract of the paper on this subject by Dr. Birdwood, which was referred to in our number for July 30:—

The burning of incense for purposes of worship is of very old date, it being represented in painting and sculpture on the monuments of Egypt and Assyria. The first mention of it and of the use of frankincense occurs in the Bible. In Exodus xxx. 34–36, we read that "Stacte and onycha and galbanum, with pure frankincense," were the "sweet spices" from which the "pure and holy perfume" or "confection" of divine prescription which was offered on the "Altar of Incense," was to be made "after the art of the apothecary." In other parts of the sacred writings it is often mentioned, Sheba being indicated as its source.

Herodotus (born B.C. 484) mentions frankincense frequently and affirms that Arabia was the only country producing "frankincense, myrrh, cassia, cinnamon and ladanum," and that the frankincense trees were guarded by winged serpents, "small in size, and of varied colours, whereof vast numbers hang about every tree . . . and there is nothing but the smoke of the storax which will drive them from the trees." The Greeks obtained their storax from the Phœnicians.

Theophrastus (B.C. 394–287) gives the fullest and most accurate account of frankincense of all ancient writers. Dr. Birdwood has supplied the following translation:—

> "Concerning frankincense and myrrh and balsam, and whatsoever is like these, it has [already] been said that they are produced by incision and spontaneously. And we must [now] endeavour to tell what is the nature of the trees, and if they have anything peculiar as to their origin or collection, or other matters; and, in like manner, concerning the other sweet-smelling trees; for almost the whole of them grow in places towards the south and east. The frankincense-tree and myrrh and cassia and cinnamon grow in the Chersonese of the Arabians, about Saba and Adramyta, and Citibæna and Mali. But the trees of frankincense and myrrh grow, some of them on the mountain and others in private plantations at the foot of the mountain, on which account some of them are cultivated and others are not; and they say that the mountain is lofty and thickly wooded and covered with snow, and that rivers also flow down from it into the plains, and that the frankincense-tree is not large, being five cubits high and covered with boughs, and that it has a leaf like that of the pear-tree, only much smaller, and is of a glassy colour, very like rue, and has altogether a smooth bark like the laurel; but that the myrrh-tree is still smaller in size and more shrub-like, and that it has a hard trunk, and is twisted towards the

* Transactions of the Linnean Society, vol. xxvii. pp. 111–148. On the Genus *Boswellia*, with Descriptions of Figures of Three New Species. By George Birdwood, M.D. Edin. Communicated by Daniel Hanbury, Esq., F.R.S. & L.S.

ground, and is thicker than a man's leg, and has a smooth bark like purslane. But others, who say they have seen them, nearly all agree concerning their size, namely, that neither of the trees is large, the myrrh-tree being the smaller and lower [of the two]. And they state that the frankincense bears a resemblance to a laurel and that it has a smooth bark, but that the myrrh is prickly and not smooth, and that it has a leaf like the elm, only crisp and prickly at the top, like the ilex tree. And they say that in a voyage they were making from the Bay of Heroes, they disembarked to search for water on the mountain, and thus saw the trees and the mode of collecting [the frankincense]. And that the trunks and boughs of both were incised; but that the former appeared to have been cut, as it were, by an axe and the latter to have had more gentle incisions; and that the drops partly fell down and partly remained on the tree. And that in in some places mats woven of palm-leaves were placed underneath, while in others the ground underneath was hardened and kept clean; and that the frankincense on the mats was pure and transparent, but that on the ground less so; and that they scraped off what adhered to the trees with knives, so that the bark stuck to some of them. And they said that the whole mountain was divided amongst the Sabæans; for that they were the lords [of the place], and that they were just towards one another, on which account no one kept any guard [over his own property]; and that having themselves taken thence an abundance of frankincense and myrrh, which they placed in their ships, none of the inhabitants being present, they had sailed away. And these both told this and said that they heard that the myrrh and frankincense is gathered together on every side to the temple of the Sun; and that this belongs to the Sabæans, being by far the most sacred thing in the country, and that certain armed Arabs have the custody of it; and that when they bring it, each, heaping up his own frankincense and the myrrh in a similar way, leaves them with the keepers, and placing upon the heap a little tablet, stating the number of measures and the price at which each measure is to be sold; and that when the merchants come they inspect these tablets, and having measured any heap that pleases them, they put the price of it in the place from which it is taken; and that the priest then coming takes a third part of the price for the god and there leaves the remainder, which is kept safe for the owners until they come and take it. But certain others say that the frankincense-tree is like the lentisck, and its fruit to the berries of the same, and that the leaf of it is reddish; and that the frankincense from the young tree is whiter and less fragrant, while that from the older trees is yellowish and more fragrant; and that the myrrh-tree is like the terebinth, but rougher and more thorny and the leaf a little rounder, and, if chewed, resembling the terebinth in taste; and that of these, also, the older are the more fragrant. And that both grow in the same place, and that the ground [there] is argillaceous and flaky, and that springs of water are rare. These things, however, are contradictory [to the statement] that it snows and is wet [in that locality] and that rivers issue from it. And others also say that it is like the terebinth, and others that it is the terebinth itself; for that specimens of the wood were brought to Antigonus by the Arabs who conveyed the frankincense, and that they differed in nothing from the terebinth. These, however, showed still greater ignorance, for they thought both the frankincense and the myrrh grew on the same tree. On which account, the report brought by those that sailed from the City of Heroes is more credible; since the frankincense-tree that grew above Sardis, in a certain temple, has a leaf like the laurel, if from this we can form a conclusion, and the frankincense produced from it, whether from the trunks or branches, is like the other frankincense in appearance and smell when it is burnt. And this tree alone grew without [any culture]. And some say that the frankincense grows more abundantly in Arabia, but more beautifully in the neighbouring islands, over which the Arabs have sway; for there they make figures upon the trees of whatever they like; which is not incredible, as they admit of any incisions that persons may wish to make in them. Some of the grains also are very large, in bulk as much as a handful, and in weight more than the third part of a mina. All frankincense is brought to the market in a rough state, similar in appearance to the bark of a tree; but of myrrh there are two kinds, the one in drops and the other in moulds. The quality is judged by the taste; and from this they choose what is of uniform colour. Concerning frankincense and myrrh, this is nearly as much as we have heard up to the present time."

Diodorus (about B.C. 50) gives a long account of this substance, in which he gives a very glowing description of Arabia the Happy, where the air is so highly perfumed with frankincense and other odoriferous trees "that it even ravishes the senses with delight, as a thing divine and unutterable," and the perfume is wafted out to sea, so that those sailing near the coast are entertained "with its pleasures and delights." He also gives credence to the myth of the trees being surrounded by fearful serpents. Speaking of an island off the coast of Arabia called Holy Island, on which no one was allowed to bury their dead, he says,—

> "The sacred isle produces frankincense, and in that abundance as suffices for the service and worship of the gods all the world over; it has likewise plenty of myrrh, with other odoriferous spices of several sorts, which breathe out a most fragrant smell. The nature of frankincense, and the manner of getting it, is thus: the tree is very small, like to the white Egyptian thorn, and bears a leaf like to the willow; it puts forth a flower of a golden colour; from the bark of this tree, by incision made, distils the frankincense in drops like tears."

Strabo (B.C. 54–A.D. 24) says,—

> "Frankincense is produced in Catabania, and in the parts of Arabia opposite. Here the frankincense-tree grows along the banks of the Isis and Nilus. The country of the Sabæi produces not only frankincense but balsam, sweet-smelling palms, calamus, and larimnum, a most fragrant perfume. By the trade in these aromatics the Sabæans and the Gerrhæi have become the richest of all the tribes."

Pliny (A.D. 23–79), too, gives a long account, agreeing in most particulars with Theophrastus. He says that the gum was at first only collected once a year, but when a greater demand sprang up, the inhabitants "feeling the sweetnesse of the gaine," made a double vintage, —the first and best in summer, about the dog-days, and the second in the spring; the first being called Carpheotum, and the second or spring crop, much inferior to the first, Dathiatum.

Ptolemy (about A.D. 150), in his Geography, places the Libanotophoros, or thuriferous region, between Makalla and Muscat.

The casual notices of frankincense by the Latin poets and historians are, as Dr. Birdwood observes, very valuable in the present argument and are very numerous. The most pertinent of them are quoted by Celsus in his 'Hierobotanicon,' who "makes a very determined effort to exhaust all the learning on the subject," and "very well proves how impossible it is to be universally learned on even so infinitesimal a subject as frankincense."

The high honour in which frankincense was held by the ancients is shown by its being one of the three gifts brought by the Magi to the infant Saviour.

The Arabian writers all agree that frankincense is produced in the Hadramaut, though Scrapion and Avicenna copy Dioscorides' mistake in saying it was also produced in India. Ibn Batuta says:—

> "Leaving Zofar (Dofar, Lee; Sephar of the Bible? G.B.), I proceeded to sea towards Amman, and on the second day put into the port of Hasik, where many Arab fishermen reside. We have here the incense-tree. This tree has a thin leaf, which, when scarified, produces a fluid like milk, this turns into gum, and is then called *loban*, or frankincense."

Marco Polo, a European writer, says of the city of Escier, or Escher:—

> "This district produces a large quantity of white frankincense of the best quality, which distils, drob by drop,

from a certain small tree that resembles the *fir*. The people occasionally tap the tree or pare away the bark, and from the incision the frankincense gradually exudes, which afterwards becomes hard. Even when an incision is not made, an exudation is perceived to take place, in consequence of the excessive heat of the climate.

"The frankincense is so cheap in the country as to be purchased by the governor at a rate of ten bezants the quintal, who sells it again to the merchants at 40 bezants. This is done under the direction of the Soldan of Aden, who monopolizes all that is produced in the district, and derives a large profit from the resale."

Thevet says that frankincense is produced, with myrrh, in the country about Pecher (Sheher?) and Fartack, cities of the kingdom of Aden; that there are two kinds, the best being whitish, pure, clean-cut and solid, collected in summer; the second, a reddish kind, collected in spring; also that the tree resembles the resinous *firs*. He gives a figure, which Dr. Birdwood takes to be an undoubted *Boswellia*, with a background of *firs*.

Garcia ab Horto, from whom Gerard copies, says that no frankincense is produced in India and he wonders that such a mistake should have been made; that there are two kinds, the best produced on mountains, and the dark and inferior produced in the plains; that the darker kinds of frankincense are called Indian by the Arabs. His figure is a copy of Thevet's without the background of *firs*.

The word olibanum, as a synonym for frankincense, was used by Pope Benedict IX. in 1033, and by Gerard in his translation of Avicenna in 1490.

Purchas, in 'His Pilgrimes' (London, 1627) notes olibanum amongst other articles brought by the Arabs for sale on the Arabian coast.

Celsus, in his 'Hierobotanicon,' has the following information regarding the native country of Olibanum:—

"It is most true that frankincense does not grow in any part of India, since whatever frankincense is consumed in India, and whatever is conveyed thence to Portugal, is brought out of Arabia, where alone it grows, and is called Lovan. On which account, I believe that writers are mistaken who consider that it is Libanum in Greek, and Olibanum in commerce, from the fact of its growing in Mount Lebanon."

Linnæus referred frankincense to a *Juniperus*, *J. Lycia*. Dr. Birdwood says he takes the statement at second-hand. This is, however, true. Linnæus in his 'Materia Medica' (Schreber's ed. Alt. 1772) says,—

506. JUNIPERUS LYCIA foliis ternis undique imbricatis ovatis obtusis. *Roy. Mgdb.* 90. Sp. Pl. 1471.

Cedrus, folio cupressi, major, fructu flavescente. *Bauh. Pin.* 487.

Loc.: Africa, Æthiopia, Arabia, *Arbor*, *peregrina*.

PHARM. OLIBANI (THURIS) Resina, granulata, oleum stillatitium, etc., and in a foot-note "OLIBANUM *ex hac arbore desumtum esse alii statuunt, alii negant, &* Sandaracam *non prioris sed hujus esse resinam volunt alii; lis pendet.*"

Bruce, whose narrative of travels met with so much undeserved opposition and incredulity, actually figures in his atlas a plant, afterwards named by Richard, *Boswellia papyrifera*, remarking that it was called *Angouah* by the people about Tacazza, and believed by the Abyssinians to be the true frankincense; he adds, "in reality it produces a gum much resembling it."

In 1807, Colebrooke proved that a frankincense-like gum was yielded by *Boswellia serrata*, of Roxburgh (=*B. thurifera*, Colebr.). From this it was concluded that this plant yielded the olibanum of commerce, and it was even denied that Arabia yielded any.

Bruce's plant was afterwards described by two botanists under different names; in 1820 by Delile, under the name of *Amyris papyrifera*, and by Endlicher in 1838, under the name of *Plösslea floribunda*.

Wellstead in 1838 found that large quantities of olibanum were exported from the Soumali coast. He says, "two kinds of frankincense are brought here for exportation to Hindustan, one called *Luban*, from Hadramaut, which is a powerful aromatic, used in the temples and houses for fumigation; the other, *Luban mati*, less fragrant, but preferred for chewing."

Cruttenden in 1837 saw the frankincense-tree on his journey from Merbat to Dyrcez, the principal town of Dejar, and in 1843 the frankincense-tree of the Soumali country. He is reporting on the Mijjertheyn tribe of Soumalis, and says,—

"During the hot season the men and boys are daily employed in collecting gums, which process is carried on as follows:—About the end of February or beginning of March the Bedouins visit all the trees in succession, and make a deep incision in each, peeling off a narrow strip of bark for about five inches below the wound. This is left for a month, when a fresh incision is made in the same place, but deeper. A third month elapses, and the operation is again effected, after which the gum is supposed to have attained a proper degree of consistency. The mountain sides are immediately covered with parties of men and boys, who scrape off the large, clear globules into a basket, whilst the inferior quality that has run down the tree is packed separately. The gum, when first taken from the tree, is very soft, but hardens quickly. The flame is clear and brilliant, and the traveller is frequently amused by seeing a miserable Bedoui family, cowering under a wretched hovel, eating their scanty meal by the light of half-a-dozen frankincense torches. Every fortnight the mountains are visited in this manner, the trees producing larger quantities as the season advances until the middle of September, when the first shower of rain puts a close to the gathering o that year."

The export, he goes on to say, is in the hands of "those never-failing speculators, the Banians of Porebunder (Kattiawar) and Bombay." At the close of the north-east monsoon they arrive at the coast, and settle at Feluk (Mount Elephant of the ancients, Cape Felix of the Portuguese, and Jibbel Feel of Captain Saris), Bunder Marayah, Bunder Khor, and other Bunders. "The Bedowins from the interior immediately visit them, and, as there is no one to compete with them, they manage to engross the greater part of the trade." He estimates that the quantity annually exported is,—

To Bombay	377 tons.
To Red Sea	235 "
To Arabia	120 "
	732

"The trees that produce *Luban*, or frankincense, are of two kinds, *Luban Meyti* and *Luban Bedowi*. Of these the *Meyti*, which grows out of the native rock, is the most valuable, and, when clean-packed and of good quality, it is sold by the merchants on the coast for one and a quarter dollars per frasila of twenty pounds. The *Luban Bedowi*, of the best quality, is sold for one dollar per frasila: of both kinds the palest colour is preferred. The trees vary greatly in height, but I never saw one above twenty feet with a stem of nine inches in diameter. Their form is very graceful, and, when springing from a mass of marble on the brink of a precipice, their appearance is especially picturesque."

In 1843 Kempthorne and Vaughan visited the Soumali country. Kempthorne's specimen was identified by Mr. Bennett, of the British Museum, with Endlicher's *Plösslea floribunda*, but on the agreement of the peculiar papery character of the barks only. Dr. Vaughan, in 'Notes upon the Drugs observed at Aden,' mentions the following kinds:—*Luban maitee*, *Luban nankur* or *aungure*, *Luban makur*, *Luban berbera* or *muslika*, and *Luban Marbat* or *Saharee Luban*, the finest kind. Vaughan's original specimens are in the Pharmaceutical Society's museum.

In 1847 Carter published a figure of the frankincense-tree of Arabia, accurately defining the thuriferous region. He says,—

"Coming from the north-east, we first meet with the frankincense-tree on the Sabhan mountains in latitude 17°. 30′ N. and longitude 55° 23′ E., where the desert ends, and the wooded mountainous region commences; and, following the coast, which runs south-west, we find the frankincense exported from the different towns gradually diminishes after the Bay of Al Kammar until we arrive at Makalla, from whence none is exported from the interior of Arabia, and but little used, except what is brought from the African coast opposite that town. By the same inquiry we learn that the produce of the Arabian trees is exported in large quantities from places on that part of the coast which intervenes between the latitude and longitude mentioned (viz. 17° 30′ N. and 55° 23′ E.) and the town of Damkote in the Bay of Al Kammar, 52° 47′ E. longitude. Between these two points the trees are congregated in two distinct localities —on the summits and sides of the highest range of mountains near the coast, and on the plain between them and the sea; the former is called *Nedjee*, or highland, and the latter *Sahil*, or plains on the coast. The *Nedjee* is about two days' journey from the shore; it is the most elevated portion of the great limestone formation of this coast, which, from a height of 5000 feet here, descends in sudden and lofty steps upon the Arabian Sea. To get to it you first cross the *Sahil* already mentioned, and then ascend a minor range, which is covered with long grass and trees, and, after passing a less fertile region, called the *Găthăn*, at last arrive at the *Nedjee*, where there is no grass and but few trees beside those which produce the frankincense. The soil is red and subargillaceous, and, in consequence of its scarcity, the trees are generally found growing out of the crevices of the limestone rock. It is from this part that the frankincense is chiefly brought, and, as I have before said, the largest quantities of it are exported from the different towns on the coast between the longitudes 50° 47′ and 55° 23′ E.

"The libanophorous region, therefore, lies behind the towns on this part of the coast where Theophrastus places it, and not, as Ptolemy places it, in Oman."

Mr. Carter also procured dried and living specimens of the tree, and made careful drawings of them. In 1859, when Dr. Birdwood took charge of the Agri-Horticultural Society's "Old Gardens" at Bombay, he found Carter's plant still living. Through the kind exertions of Colonel Playfair, then at Aden, he obtained a fine collection of several varieties of dried specimens and cuttings of the African frankincense-tree, together with the frankincense yielded by them. Both Carter's and Playfair's plants have since flowered, and thus allowed of their being named.

Dr. Birdwood, in his "conclusions," says:—

"It will, I believe, be now agreed that Arabia produces frankincense, and in the very region indicated by common opinion of the ancient world, and so accurately limited by Theophrastus. Now that it has been demonstrated by Carter that the libanotophorous region lies along the coast of Hadramaut, the agreement between the statements of the Bible, Herodotus, Theophrastus, Diodorus Siculus, Strabo, Pliny, Arrian, Ptolemy, the Arabs, Marco Polo, Bochart and Celsus is very striking. It will, I believe, be agreed also, as implied in the more ancient references to Arabia, and expressly asserted by Diodorus, Strabo, Arrian, and others of the ancients, and demonstrated with such fulness by Cruttenden, Kempthorne and Vaughan, and the overwhelming evidence of modern travellers (beginning with Bruce) generally, that the Soumali country also produces frankincense and probably the bulk of the olibanum of commerce. The agreement as to the region about Mount Elephant (Ras Fieluk, Cape Felix, Jibbel Feel) between Arrian, Captain Doventon and Captain Saris, in Purchas, Milburn, Cruttenden, Kempthorne and Vaughan is indeed quite startling.

"It will be admitted also, I believe, that *Boswellia Carterii* (*Mohr Madow*), which—with *B. Bhau-Dajiana* (*Mohr Add*), the source of the bulk of the olibanum of commerce exported from the Soumali country—is the same species as the plant (*Maghrayt d'sheehaz*) which Carter found produced the frankincense of the Hadramaut, and also that *Boswellia thurifera* (including *B. glabra*) of India and *B. papyrifera* of Abyssinia, although thuriferous species, are not known to yield any of the olibanum of commerce.

"It is very surprising that so great weight of evidence in favour of frankincense being produced in Arabia Felix and the Soumali country should ever have been set aside for the idle fancy that India was the source of the olibanum of commerce."

Dr. Birdwood rightly attributes at least a portion of this mistake to a most prolific source of error, namely, the alteration which has taken place in the trade-routes.

In the Paris Universal Exhibition of 1867, Dr. Birdwood noticed several bottles of frankincense labelled "Olibanum, so called because it comes from Mount Lebanon;" also aconite labelled "*Aconitum Nepaullus*, so named because its root is the famous poison of Nepaul"!

Dr. Birdwood then gives descriptions of the genus *Boswellia* and the species belonging to it, as enumerated below, with the synonyms of each species.

Genus Boswellia.

Roxburgh, Pl. Corom. iii. p. 4. t. 207; Benth. and Hook. Gen. Plant. i. p. 322.

Libanus, Colebrooke in Asiat. Res. ix. p. 377. t. 5. f. 1.

Plösslea, Endlicher, Nov. Stirp. Dec. 47; Iconog. t. 119, 120.

Species 5. natives of Nubia, Abyssinia, Berbera, Arabia, and India.

1. Boswellia Carterii, Birdwood, n. sp. (with figures).
   B. thurifera, Colebrooke? Carter in Journ. Bombay Br. Roy. As. Soc. ii. 1847.
   "Mohr Madow," Playfair.
   "Maghrayt d'sheehaz," Carter.
   Habitat. Soumali mountains, Africa; Hadramaut Mountains, Arabia.

   The "mohr madow" and "maghrayt d'sheehaz" are two varieties, figures of both are given.
2. B. Bhau-Dajiana, Birdwood, n. sp. (with figure).
   "Mohr Add," Playfair (Soumali mountains).
   Habitat. Soumali mountains.

   These two species yield the bulk of the olibanum exported from the Soumali country under the name of "Laban-Sheheri."
3. B. papyrifera, Richard, Tent. Flor. Abyss. etc. iv. p. 140. t. 33.
   Amyris papyrifera, Delile, Cent. Pl. d'Afrique; Caillaud, Voyage à Méroé, ii. p. 293.
   Plösslea floribunda, Endl. Nov. Stirp. etc., n. 47. t. 119, 120.
   "Angouah," Bruce's Travels, vii. p. 334. tab. 48.
   Habitat. Senaar, Soudan, Gondar, and the valley between the Taccaze and Mareb.
4. B. thurifera, Colebrooke, Asiat. Res. ix. p. 377. t. 5.
   B. serrata and *B. glabra*, Roxb. Flor. Ind. ii. pp. 383, 384.
   B. glabra, Roxb. Cor. Pl. ii. t. 207.
   "*Salai*," India (Birdwood).
   Habitat. In the mountains of Tropical India; Oude and Rohilkund, *Royle*; Behar, *Hooker*; Concan, *Stocks*; Kattyawar, Khandeish, *H. M. Birdwood.*

   There are two varieties of this plant and its gum-resins recognized by the natives of India, of which Roxburgh made two species.
5. B. Frereana, Birdwood, n. sp. (with figure).
   "Yegaar," Playfair.
   "Louban maitee" of the Soumalis.
   "Louban meyti," Cruttenden.
   Habitat. In the white limestone mountains about Bundah Murayha.

We are highly grateful to Dr. Birdwood for this very interesting and valuable paper, which must have cost him immense labour and painstaking research. It is, without doubt, one of the best monographs on any materia medica substance we have had for some time, and will undoubtedly receive the recognition it is so well entitled to. Dr. Birdwood tells us that this is the "first of a series of monographs on such of the vegetable products of the East, the history and botany of which need further elucidation." We look with interest, and with some degree of impatience, for further contributions from his pen, especially when we find he has not overlooked one of the most fundamental desiderata of economic botany, that of procuring really well-authenticated specimens of the products collected from the plants themselves. He tells us that nearly all the gums and resins in the Bombay Museum were collected by his own hands.

OUR SALAD HERBS.

BY C. J. ROBINSON.

There is, perhaps, no country in the world so rich as England in native materials for salad-making, and none in which ignorance and prejudice have more restricted their employment. At every season of the year the peasant may cull from the field and hedgerow wholesome herbs which would impart a pleasant variety to his monotonous meal, and save his store of potatoes from premature exhaustion. Besides there can be no question that in hot seasons a judicious admixture of fresh green food is as salutary as it is agreeable. Much has been said lately about the advantage which the labouring man would derive from an accurate acquaintance with the various sorts of fungus; he has been gravely told that the *Fistulina hepatica* is an admirable substitute for beef-steak; the *Agaricus gambosus* for the equally unknown veal cutlet. But deep-rooted suspicion is not easily eradicated, and there will always be a certain amount of hazard in dealing with a class of products in which the distinctions between noxious and innocuous are not very clearly marked. There is not this difficulty with regard to salad herbs, and we conceive that the diffusion of a little knowledge as to their properties and value would be an unmixed benefit to our rural population.

The first place must be assigned, on the score of antiquity, to the sorrel plant (*Rumex Acetosa*), which in some districts still preserves the name of "green sauce" assigned to it in early times when it formed almost the only dinner vegetable. Its acid is pleasant and wholesome, more delicate in flavour than that of the wood-sorrel (*Oxalis Acetosella*), which, however, is used for table purposes in France and Germany. Chervil (*Anthriscus Cerefolium*) is often found in a wild state and is an admirable addition to the salad bowl; and it is unnecessary to enlarge upon the virtues of celery (*Apium graveolens*) when improved by cultivation. John Ray, writing in 1663, says that "the Italians use several herbs for sallets which are not yet, or have not been used lately, but in England, viz. *selleri*, which is nothing else but the sweet smallage; the young shoots whereof, with a little of the head of the root cut off, they eat raw with oil and pepper;" and to this we may add that the alisander (*Smyrnium Olusatrum*) is no bad substitute for its better known congener. The dandelion, which in France is blanched for the purpose, affords that *amari aliquid* which the professed salad-maker finds in the leaves of the endive, and the same essential ingredient may be supplied by the avens (*Geum urbanum*), the bladder campion (*Silene inflata*), and the tender shoots of the wild hop. Most people are familiar with the properties of the watercress (*Nasturtium officinale*), and the garlic hedge-mustard (*Erysimum Alliaria*); but it may not be generally known that the common shepherd's-purse (*Capsella Bursa-pastoris*) and lady's-smock (*Cardamine pratensis*) are pleasant additions, whose merits have long been recognized by our foreign neighbours. In fact, there is scarcely a herb that grows which has not some culinary virtue in a French peasant's eyes. Out of the blanched shoots of the wild chicory (*Cichorium Intybus*) he forms the well-known *barbe des capucins*, and dignifies with the title of *salade de chanoine* our own neglected corn-salad (*Fedia olitoria*). It would be very easy to extend the dimensions of our list of native salad herbs, for there are, perhaps, some palates to which the strong flavours of the chive (*Allium schœnoprasum*) and stone-crop (*Sedum reflexum*) may commend themselves; but enough has been said to show that Nature has not dealt niggardly with us, and that only knowledge is needful to make the riches she offers available. If the British peasant can be taught to discover hidden virtues in these plants, with whose outward forms he has had lifelong familiarity, we do not despair of his acquiring the one secret of salad-making, viz. the judicious employment of oil so as to correct the acrid juices of the plants and yet preserve their several flavours unimpaired.—*Nature.*

NITROUS OXIDE GAS.

In a letter to the 'Times' of August 17, Dr. Thudichum recommends the use of this gas in surgical operations upon wounded soldiers. He remarks:—

"All possible efforts ought to be made to reduce the sum of pain to which, by surgical operations and dressings, they are necessarily subjected. Chloroform is largely used for this purpose, but its application meets with difficulties in many cases. Thus, the mere excitement of the wounded soldier is frequently so great that, for fear of choking, it cannot be applied at all; in other cases it produces sickness which continues often for hours after its application and compromises the welfare of the patient. Its action is of such a kind that, practically, it is only applied for long and severe operations, rarely for slight ones; but never in that most painful and oft-repeated process, the dressing of wounds.

"All the advantages of chloroform, to the exclusion of the disadvantages just mentioned, are possessed by nitrous oxide gas. It has no smell, produces quickly, in four or five full inspirations, a perfect anæsthesia, in which all operations can be performed without causing pain, and hardly a minute after the cessation of its inhalation its influence on the patient has entirely disappeared. It never produces choking or sickness, and there has never been a case of death under its influence.

"The marvellous effect of this gas was originally discovered by Sir Humphry Davy, but was not appreciated by the scientific world, owing to the wanton ridicule cast upon it by the short-sightedness of Gay-Lussac, and of several chemists following in his wake. It is the indubitable and great merit of British dentists to have again discovered the pain-killing effect of nitrous oxide, and to have made its use for the relief of suffering a matter of daily and easy practice.

"A bulky gas could not be transported with the necessary facility, and therefore its use remained limited to institutions. But industry seized the processes, and the gas was brought into a compressed form. This compression is now carried to fluidification. Nitrous oxide is sold as a fluid in little iron flasks, of which each, hardly bigger than a wine bottle without the neck, evolves 100 gallons of gas. The production of this fluid nitrous oxide is now a branch of industry carried on by the aid of steam power erected specially and exclusively for this purpose and yet the supply is hardly equal to the demand.

"Now, from my experience in war-surgery and in the application of anæsthetics; from the inquiries which I have instituted and the experiments which I have made relating to this nitrous oxide, I have come to the conviction that this agent would be most useful in the military hospitals of the Continent, not only in primary operations, but also in the frequent painful dressings. There is less difficulty in its administration than in that of chloroform, and all surgeons would easily and quickly be able to appreciate and use it.

"I, therefore, propose that a portion of the funds which I have, no doubt, your generous appeal will cause to come forth abundantly should be applied to the purchase of, say, 1000 bottles of this pain-destroying fluid, and of fifty inhaling mouthpieces, and that these should be forwarded to the hospitals abroad as quickly as they can be obtained. The experience should be made on this scale to begin with. The discoveries of the gas, of its properties, and of its application in surgery, are exclusively English, and the processes for its fluidification, or 'coercion,' are worthy examples of English mechanics. The gift would, therefore, be doubly graceful, as being both invaluable and the product of national genius and ingenuity, and would be applied with joy by the surgeons and received with blessings by the stricken warriors."

In reference to the above letter the 'Lancet' has the following remarks:—

"We should be extremely sorry to offer any opposition to any proposal which presented a hopeful prospect of mitigating the pain of the wounded, but we think that the generosity of the public should not be taxed for visionary and doubtful schemes, such as that proposed by Dr. Thudichum for supplying nitrous oxide gas. There are, doubtless, some advantages in using this anæsthetic for short operations, such as toothdrawing and the making of incisions of a simple character. But there is no experience in favour of its use either for dressing wounds, or for more important operations; and, from the fleeting character of the anæsthesia, there is no hope whatever of its being really effective in such cases.

"We would venture to suggest in preference the formation of a special staff for the purpose of directly relieving pain by the use of the many means which are now at our disposal. First and foremost, they would be armed with a full supply of chloroform; secondly, with Dr. Richardson's apparatus for the production of local anæsthesia; and we would, of course, make no objection to nitrous oxide having also a place in the armamentarium. Nor should these be all. The subcutaneous injection of sedatives would be of great use, particularly in allaying the spasms which so painfully follow fractures and amputations; whilst, in the last place, hydrate of chloral would probably be found to relieve insomnolence to a very great extent. One or two physicians armed with these remedies would not only relieve an immense amount of physical and mental suffering, but would afford the profession an experience of the very highest value."

HARD AND SOFT WATER.

At the recent visit of the town council to the waterworks, Mr. Bateman drew attention to the reports which have been industriously circulated of late years to the prejudice of soft water, attributing to its use the great mortality which unhappily exists in some of the large towns and cities in the kingdom. He stated most unhesitatingly that there was in truth no foundation for such reports; that they were entirely fallacious; and that the presumed facts which were relied upon would not bear the test of scrutiny. He referred to a table appended to the evidence taken before the Committee of the House of Commons on the East London Water Bill in 1867, when the whole question of the metropolitan water supply had been inquired into. This table purports to give the mortality of various towns and places, distinguishing between those supplied with water above and below ten degrees of hardness. This division is perfectly arbitrary, and it does not correctly represent the point of distinction between hard water and soft water. The term "hard" is applied to water which breaks or curdles soap,* while the term "soft" is applied to water in which soap may be used without its curdling. Each degree of hardness represents one grain of carbonate of lime, or an equivalent quantity of some other soap-destroying ingredient, in each gallon of water. Water containing only four grains of lime per gallon, or having what is called 4° of hardness, does not break soap; while water having 5° or upwards does. Water of 10°, therefore, is hard water, and its evil consequences, as regards economy, will be shown by the fact that in Glasgow the substitution of Loch Katrine water of 1° of hardness for Clyde water, which varied from 7° to 9°, according to the season, saved one half of all the soap which had previously been used.

The table referred to contains the names of sixteen towns or places supplied with water of 10° or upwards, and of eleven towns in which the water supply does not amount to 10°. Among the latter is Liverpool, where the water is stated to be 9·6°.

The general conclusion is, that in towns with water over 10°, the average being 14·9°, the mortality is only 22·2 per 1000 of the population; while in those having water under 10°, the average being 4·9°, the mortality is 26·1. In London, the water being 13° of hardness, the mortality per 1000 is 23·1.

From these data it has been inferred that the excessive mortality of towns using soft water is due to the use of such water.

However, to say nothing of the unfairness of comparing such towns as Leamington, Southport, Croydon and Cheltenham with Liverpool, Sheffield, Glasgow and Manchester, the table itself is full of inaccuracies. Guildford, the county town of Surrey, is represented to contain 29,330 persons and the mortality to be 19·4 per 1000. Guildford is, in reality, a small town, with less than 10,000 inhabitants. It is situated in a remarkably healthy position, and a large number of the inhabitants which it really does contain reside in what may be considered a purely rural district.

Newcastle and Gateshead are put down as containing 14,646 persons, and the mortality is stated to be 19 per 1000. The real population of those places at the date spoken of was 163,807, and the mortality 27·37 per 1000.

It is evident that no dependence can be placed on tables so carelessly prepared, and it may be shown in a variety of ways that no fair deduction can be drawn from them at all.

The gross population of the sixteen towns or places having water of 10° or upwards is, according to the table, 1,135,514, and that of the eleven towns with softer water 1,532,784. The density of population (which, however, is not shown in the table) is, in the former group, 10·17 persons to the acre, and in the latter group 214·74; so that in the towns of higher mortality the people are living more than twice as thick upon the ground as in those places with which they are compared.

To most persons this density of population would have been supposed to exercise an important bearing on the mortality of a district, and to all those who have paid any attention to the question it is well known to exercise a very important influence, especially on the health of infants under five years of age. Infantile mortality is always greatest in manufacturing towns, and in places of dense population, whatever the character of the water which may be supplied. If these deaths be deducted, then, the mortality per 1000 of those above five years is 13·56 in the towns supplied with water of 10° or upwards, and 13·47 per 1000 in those having softer water, or slightly in favour of the latter, though practically the same.

But the strongest proof that excessive mortality must be sought for in other causes than the hard or soft character of the water supplied to the inhabitants will be seen by an examination of the mortality which obtains in different places supplied with the same water. For instance, in the table alluded to, the population assigned to Birmingham (a town supplied with water of 15½° of

* This effect of hard water is, in fact, a precipitation of the fatty acid of the soap consequent on the formation of an insoluble compound of the fatty acid with the earthy base in the water.—Ed. Ph. J.

hardness) is made up of those living in Birmingham, King's Norton and Aston, the density of population being respectively 100·, 1·37, and 2·7 persons to the acre, the mortality being also respectively 26·5 per 1000, 17·1, and 21 per 1000. This varying mortality cannot surely be owing to the water, which is the same in all the three cases.

Again, Liverpool having water of 9·6° of hardness is composed of Liverpool and West Derby, the mortality being in the former place 33·29, and in the latter 22·73 per 1000. Here, again, the water is exactly the same, but the density of population is respectively 100 and 3·7 per acre.

Sheffield, a soft-water town, is composed of Sheffield and Eccleshall, the mortality in the two places being 28·45 and 22·75.

Manchester, Salford and Charlton-on-Medlock, all places supplied with the soft water of the Manchester Waterworks, exhibited a mortality at the time the table was prepared of 31·48, 26·00 and 23·94 per 1000 persons respectively. If the high death-rate in Manchester were due to the soft water, why did it not poison as many persons in the 1000 at Chorlton-on-Medlock and at Salford?

Instances from all quarters of the kingdom could be crowded upon each other showing a like result, and the fallacy of the deductions which have been drawn from such unfair statistics as have been thus only slightly exposed.

The fact is that neither hard water nor soft water appears to exercise any perceptible influence on the tables of mortality. Both, so far as those characters are concerned, appear to be equally wholesome; and though many painful diseases which are not fatal are, with reason, believed to be aggravated by the use of hard water, there is no reason for assuming that any influence is exercised upon the death-rate by the mere hardness or softness of water.

While it is thus most conclusively shown that, as compared with hard water, soft water is not injurious to health, the economic benefits which attend the use of soft water are so striking and so great, that those people may consider themselves happy indeed who have the advantage of such deliciously pure and soft water as the waterworks of Glasgow and Manchester afford.

In Glasgow, the saving to the consumer of water for domestic purposes only consequent on the introduction of Loch Katrine water in the place of Clyde water was £40,000 per annum, equal to the interest on the entire cost of the new works. This great advantage, too, has been obtained without levying a higher rate on the rental of houses than had previously existed, so that the people of Glasgow have paid no more per head for their water than they had done before, while at the same time they put £40,000 a year into their pockets.

Similar advantages have attended the supply to Manchester, but they have not been so obvious, because the change in the water-supply was introduced gradually, instead of being made at once from hard water to soft.

INVERTED SUGAR.

BY JAMES DEWAR, F.R.S.E.

Lecturer on Chemistry, Veterinary College, Edinburgh.

For some time past an animated discussion has been going on in the columns of the 'Comptes Rendus de l'Académie des Sciences' between MM. Dubranfaut and Maumené regarding the nature of inverted sugar. M. Dubranfaut, many years ago, made many valuable additions to our knowledge concerning the composition and reactions of various sugars, especially in explaining the result of the action of dilute acids on cane sugar. He explained the levo-rotatory action of inverted sugar, and its rapidly varying power with the temperature, as the result of a molecule of water, in reacting with a molecule of cane sugar, generating one molecule of glucose and one of lævulose. Dubranfaut believed that inverted sugar consisted of a mixture of glucose and lævulose in equal weights; and although he did not make a direct analysis of the product, yet he was justly entitled to assume that it was so constituted, seeing that, generally, it agreed with a mean of the properties of inulin sugar and dextrose.

In order to support the above view, he separated levo-glucose from the inverted sugar, through the insolubility of the lime compound, and compared its properties with pure lævulose. The decomposition would, according to Dubranfaut, be as follows:—

$$\underset{+\,73{\cdot}8}{C_{12}H_{22}O_{11}} + H_2O = \underset{+\,56}{\overset{+}{C_6H_{12}O_6}} + \underset{-106}{\overset{-}{C_6H_{12}O_6}}$$
$$(-25)$$

So thoroughly had his facts and explanations been accepted by chemists generally, that up to a recent date, no one had discovered any flaw in his researches, and therefore no doubt was thrown on the validity of this theory. Recently, Maumené has reinvestigated the composition of inverted sugar by analysis. He has attempted to separate the two sugars through the action of chloride of sodium. The dextro-glucose forms a well-defined crystalline compound with chloride of sodium, whereas the lævulose does not form any compound. The results obtained by this method differ greatly from theory. Instead of finding 50 per cent. of lævulose, he found 88 per cent. In repeating the experiments of Dubranfaut on the separation of levo-glucose by hydrate of lime, he has not met with any better results; in fact, his results are quite opposed to those of Dubranfaut.

Apart altogether from expressing an opinion on the merits of the views entertained by the different parties to this discussion, the author has thought some observations of the same subject might not be unworthy of notice at the present time.

Linneman, many years ago, applied the process of hydrogenation to the sugars that he had found so successful in treating the simple organic substances. In the way named he obtained mannite from inverted sugar, the following reaction taking place:—

$$C_6H_{12}O_6 + H_2 = C_6H_{14}O_6.$$

Mannite had long been known to be the product of certain kinds of fermentation, and occurring as a secondary product in the vinous fermentation; but it was this elegant synthesis of Linneman that first clearly showed the connection. But although inverted sugar can be changed into mannite, the next point that demands a solution is the proving the inverted sugar to be composed of equal quantities of dextrose and lævulose. Are they both transformed by hydrogenation into mannite? or is only one of them, and which? Linneman seems to have directed his attention to the solution of this question. He states that it is only the lævulose that is so affected. The reasons why he entertains the above views are not given. In all likelihood he thought that, just as Berthelot had changed mannite by a peculiar fermentation into levo-glucose, so would the levo-glucose in inverted sugar be hydrogenized into mannite.

In repeating the action of sodium amalgam on inverted sugar, I have not seen any reason why the one sugar any more than the other should be supposed to generate the mannite. The following is a description of the mode by which the sugar was inverted and hydrogenized:—20 grammes of cane sugar were dissolved in 150 grms. of water, and inverted through the action of 2 grms. of sulphuric acid, keeping the solution at the temperature of 70° C., afterwards adding pure carbonate of barium, filtering, and then adding one gramme of sodium in the form of a weak amalgam. The action took place without any evolution of hydrogen. If the amalgam was impure from the presence of other metals, it evolved hydrogen at once, and the solution became brown; otherwise it remained perfectly clear. After one month the solution gave no trace of sugar with the alkaline copper solution. It was then carefully neutralized with dilute sulphuric acid, evaporated on the water bath, the greater part of the sulphate of sodium separated by crystallization, and the residue treated with boiling 70 per cent. alcohol, the solution filtered and allowed to crystallize. Sometimes the mannite did not crystallize until all the alcohol had evaporated, leaving a syrup that slowly assumed the crystalline form. The product had no rotatory power. In no case was the sugar entirely changed into mannite—a gummy substance was invariably left, that would not crystallize after exposure to the air for months. Mannitan, or some similar body, may be one of the products.

Dextro-glucose made from honey gave mannite when treated in the same way, having exactly the same melting-point as ordinary mannite. In treating milk sugar with dilute sulphuric acid, changing into gallactose and hydrogenizing, dulcite was not isolated; but I have not specially studied the reaction.—*Proceedings of the Royal Society of Edinburgh.*

Introduction of the Ipecacuanha Plant into India.—The Duke of Argyll addressed the Governor-General on the 20th April as follows:—"I have considered the dispatch from your Excellency in Council, dated 25th January, urging upon me the importance of introducing the ipecacuanha plant into India, and suggesting that Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, now in this country, should be asked to submit proposals as to the best means for obtaining the object in view. On the application of the Government of Bombay last year, I had already recognized the importance of introducing this valuable medicine; and the two plants received at Bombay having died, I had already taken steps for procuring others for transmission in July next. I transmit to you the correspondence which has been held with Dr. Anderson on this subject; and I trust that, even should the other attempts fail, Dr. Anderson will still have a sufficient number of strong plants to take back with him to India to secure the introduction and establishment of the plant. It seemed to me that an application through the diplomatic agents of her Majesty was not likely to be so successful as an application through commercial or scientific gentlemen. You will see from the accompanying memorandum by Mr. C. R. Markham that he has written to Messrs. Miers and Co., of Rio, to Mr. Bramah and to Dr. Otho Wucherer to obtain roots of the plant. The accompanying correspondence with Dr. Cleghorn and Dr. Balfour will show you that I have also enlisted the kind assistance of the Royal Botanical Gardens at Edinburgh besides the aid promised at Kew. I forward also copies of the memorandum on the propagation of the ipecacuanha plant prepared by Mr. M'Nab, of the Royal Botanical Gardens at Edinburgh. Dr. Christison and Dr. Balfour have likewise applied to Dr. Gunning, a medical practitioner at Rio, to assist them in obtaining plants and seeds. I add to these documents the letters which have passed between Dr. Hooker and this office on the supply of plants for Bombay. You will learn from my dispatch to that Government that the plants destined for them will be retained at Kew, and two healthy plants will be sent to them from the Botanical Gardens at Calcutta."—*Allen's Indian Mail.*

Singular Case of Substitution.—A sample which professed to consist of pure chloride of aluminium in crystals was recently supplied by a leading operative chemist in London. On subjecting it to chemical analysis, however, it proved to be common potash alum.

The Invention of Soda-Water is ascribed to Dr. Hawkins, of Philadelphia, a blind chemist, who, in 1812, made the first soda fountain in America,.—*Philadelphia Medical and Surgical Reporter.*

HELP FOR THE WOUNDED.

We have received through Dr. Sieveking the following letter in reference to the suggestion put forward in last week's Journal:—

2, *St. Martin's Place, Trafalgar Square,*
August 24th, 1870.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—On behalf of the Central Committee of the Association for the Sick and Wounded, I beg to thank you for the appeal you have made in your last issue to the pharmaceutists of Great Britain to promote the objects of the Association. I beg to offer you and the pharmaceutists who may respond to your call our warmest thanks for any aid you may afford us.

With the view of rendering this aid as efficacious and practical as possible, I take the liberty of submitting to you the following list of articles which (with the most available forms for immediate use) have been agreed upon by Doctors Sieveking and Pollock, medical members of our Committee, as being more immediately required from the stores at your disposal.

Opium in all forms.

Opium in pills containing 1 grain each, put up in small bottles, 4 dozen pills to each bottle.

Morphia, in pills containing $\frac{1}{4}$-grain each.

Laudanum, in 2 oz. bottles.

Liq. Ammoniæ, in 2 oz. bottles.

Sal volatile, in 8 oz. bottles.

Chloroform, 1 lb. to each bottle.

Quinia, in bulk, and in 2-grain pills, 4 dozen to each bottle.

Hydrate of chloral, in 2 oz. bottles.

Carbolic acid.

Condy's fluid.

Chlorinated lime and soda.

Effervescing salines.

Lint.

Bandages of cotton, linen, or flannel, with the lengths marked on each.

Cotton-wool—sponges—waterproof sheeting—icebags—oil-silk.

It is thought desirable that all medicines should be distinctly labelled, in English and Latin, with the doses, and that each parcel or box should be accompanied by a list of its contents.

Fuller lists of articles required for the wounded soldiers are published by the Society, but I have confined myself in the above enumeration to the articles that would appear to come more immediately under the cognizance of your readers.

Thanking you again for your advocacy of a cause which demands our liveliest sympathies, I have the honour to be, Sir,

Your obedient servant,
ROBERT LOYD LINDSAY,
Lieut.-Col. and Chairman of Committee.

Supply of Sulphate of Quinine to the French Army.—The *intendance militaire* has advertised for estimates for 500 kilogrammes of sulphate of quinine, to be supplied at the rate of 125 kilogrammes a month. This advertisement has suggested various surmises regarding the health of the army, but they are not of sufficient value to repeat. The fact, nevertheless, is worth noticing.—*British Medical Journal.*

Morfit's Hair Dye.—Scald black tea, two ounces, in one gallon of boiling water; strain, and add three ounces of glycerine, tincture of Spanish flies, half an ounce, and bay rum, one quart; digest the mixture for two or three days, and perfume with essence of rose or bergamot, or any other favourite essence to suit the taste.—*Philadelphia Medical and Surgical Reporter.*

The Pharmaceutical Journal.

SATURDAY, AUGUST 27, 1870.

MAJORS AND MEMBERS.

A glance at the Calendar and at the monthly report of the Council's proceedings, shows that whilst the number of candidates for the Major examination is happily increasing, only a few of those who pass take up their membership before commencing business on their own account. At the present time there are, we believe, no fewer than 200 examined Pharmaceutical Chemists, who are not on the list,—nearly one-tenth of the total number of members.

We desire to call attention to this subject, because it still seems not to be generally known that every one who has passed the Major examination is eligible to be elected a member of the Pharmaceutical Society, whether he be in business or not: that it is only necessary to apply to the Secretary, who will in due course present to the Council the names of applicants for election.

Though it is an obvious truism, it cannot be too often reiterated, that the Society's future strength and usefulness are in a great degree dependent upon the young examined men. Their number is now considerable, and the Society cannot afford to wait for the prestige it would derive from the accession of such valuable alumni.

They may be regarded as the highly trained soldiers of Pharmacy who are destined to replace that noble band of volunteers who have manfully held the ground for nearly thirty years, in the confident hope that every successful student would, at the earliest moment, rush eagerly to the front to relieve them.

We constantly need the daily practical experience of educated assistants as well as of employers; they can render material assistance in the endeavour to deal with the difficult subject of storing poisons. Their views would be of special service for determining the most efficient method of spreading professional knowledge throughout the provinces, so that the poorest apprentice might himself pave the way towards passing a creditable examination. Their solicitude in maintaining the high standard of the examinations and the qualifications of examiners, would also be of real service, while at no distant time, some of the more distinguished of them will be required to fill up vacancies in the Board of Examiners; for, independently of technical qualification, the Examiners must be members of the Society. Nor can we omit to mention the privilege of voting, seeing how much our internal welfare and material prosperity depend upon a thoughtful and judicious exercise of the power which it confers. In order not to be misunderstood, let us disclaim the idea that we are pleading for an extra half-guinea subscription. The last balance-sheet proves that the Society is not only free from pecuniary wants, but that it is investing money largely. We desire, and we hope to secure, the *personal* support far more than the money of those who constitute the truly professional element in pharmacy and to whom we now address ourselves.

We do not hesitate to assert that in regard to influence with the public, in regard to the means for developing a system of liberal education for the rising generation of chemists and, in regard to facilities for generally diffusing sound practical science, the capabilities of our Alma Mater are vastly increased by each single educated pharmacist who becomes in every sense a member of the Society.

MR. SIMON ON THE PHARMACY ACT.

The reports of the medical officer of the Privy Council will henceforth be documents which will have an official interest and authoritative value for the members of the pharmaceutical profession. As the Privy Council is the controlling authority in respect to the working of the Pharmacy Act, while the medical officer of the Privy Council is the official adviser of that body in all concerning the interpretation and administration of the Act, we shall have to look to his reports for the indication of the views of the Government, so far as it concerns itself with our body. Perhaps, on the whole, the less it does concern itself with us, at present, the better for the public, for ourselves and for every one. But since the pharmaceutical profession has received considerable privileges as well as a responsible and important monopoly, it will of course, in the future, have to reckon with official supervisors, while hitherto it has been entirely free and unfettered. We may state that it will be found that the twelfth report, which is about to issue, gives an account of the work done by the department up to the beginning of the present year, in respect to the Pharmacy Act. This is described as consisting in the approval of a code of consolidated and amended bye-laws, under which admission is granted to the practice of pharmacy, additions to the schedule of poisons annexed to the Act, and the appointment of a visitor to the examinations of the Pharmaceutical Society on the part of their Lordships.

"It had long," says Mr. Simon, "been a desideratum in Great Britain, as regards the practice of pharmacy, that this skilled commerce—where unskilfulness means very serious danger to the public health—should only be open to persons whose qualifications for practising it safely had been tested by proper examination; and the appended reports appear to me to give ground for much public satisfaction, as showing that the system which the Pharmacy Act of 1868 brought into operation, provides adequate security to that very important effect."

We will next week give further details from this report, the publication of which marks the commencement of an important era in the history of the practice of pharmacy in this country: the era of universal and improved pharmaceutical education, of State recognition, and of the consolidation, as one united body, of the pharmacists of Great Britain.

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

We are glad to find that the suggestion put forward last week, has met with very cordial approval and recognition, not only from Pharmaceutists, but also from the Committee, as will be seen from the letter of the Chairman, inserted in another column. Contributions are already coming in, and our contemporary the *British Medical Journal* in speaking of the appeal as timely and well-placed, expresses the belief that, on this occasion, the numerous members of the trade will respond to it as liberally as they did, on a former occasion, to a private appeal in favour of the Garibaldian volunteers. In the letter already referred to will be found a list of the articles which the medical members of the Committee, Dr. Sieveking and Dr. Pollock, have agreed upon as being more immediately requisite. The mode of labelling and packing to be adopted is also pointed out there. The following is a list of the contributions received or promised up to the time of going to press:—

	£.	s.	d.
"Bestia"	0	5	0
Binge, Thomas, 23, Stockbridge Terrace	0	5	0
Bishop, Alfred, Mile End, N.E.	1	1	0
Blake, Sandford and Blake, 47, Piccadilly, W.	2	2	0
Bourdas, Isaiah, Pont Street, S.W.	2	2	0
Bremridge, Elias, 17, Bloomsbury Sq., W.C.	1	1	0
Buckle, C. F., 77, Gray's Inn Road	0	10	0
Crowther, T., Tickhill	1	9	0
Deane, Henry, Clapham	1	0	0
Dinneford and Co., 172, New Bond Street	2	2	0
Floyd, J. F., Bury St. Edmund's	1	0	0
Garle, John, Bickley	1	1	0
Harvey and Reynolds, Leeds	5	0	0
Lake, Richard, Greenwood Road	0	10	0
Passmore, F., 17, Bloomsbury Square	0	5	0
Savage, W. D., Brighton	1	1	0
Sutton, Francis, Norwich	1	1	0
Tibbs, Frederick, Blackfriars Road	0	10	6
Wagstaff, J.H., James St., Westbourne Terrace	1	0	0
Whitfield, J., Scarborough	0	10	0

Per Mr. Sturton, Local Secretary, Peterborough:—	£.	s.	d.	£.	s.	d.
Bright, Richard	0	10	0			
Heanley, Marshall	0	10	0			
Loveridge, T. P.	0	2	6			
Negus, F. J.	0	2	6			
Parker, John Samuel	0	2	6			
Parnell, John	0	10	0			
Pearson, John H.	0	10	0			
Sturton and Sons	0	10	0			
Whitwell, John	0	10	0			
Willson, Stephen	0	10	0			
				3	17	6

Per Mr. Mays, Local Secretary, South Shields:—	£.	s.	d.	£.	s.	d.
Crosby, J. B.	0	10	0			
Forrest, Robert	0	10	0			
Hudson, Thomas	0	10	6			
Mays, R. J. J., and Son	1	1	0			
Oates, Thomas	0	10	0			
Williamson, B. and E.	0	10	0			
				3	11	6

John Bell and Co., 338, Oxford Street:—
Two boxes of medicine, to the amount of 25 0 0
containing:—
I. Opium pills, 1 grain each, in bottles containing 4 dozen each.
Morphia pills, ¼ grain each, in bottles.
Quinine pills, 2 grains each, in boxes.
Chloroform, ½ lb. bottles.
Laudanum, in 4 oz. bottles.
Sal volatile, in 4 oz. bottles.
Citro-tartrate of soda, in 4 oz. bottles.
Lint.
II. 50 lb. prepared oakum for surgical purposes.

J. Robbins and Co., 372, Oxford Street, W.:—
7 lb. lint.
12 yards adhesive plaster.
1 dozen bottles styptic colloid.

J. Robinson, Orford Hill, Norwich:—
A quantity of old linen.
1-oz. bottle of citrate of iron and quinia.
1-oz. bottle of sulphate of quinine.

A. P. Towle, Manchester:—
100 1-oz. bottles of chlorodyne.

The *Lancet*, in stating that the Council of the Royal College of Surgeons has determined to remove from the list of its members the name of Edwin Lowe, lately convicted for administering a drug with criminal intent, says,—"We cannot but admire this vigilance on the part of the Council and applaud the result to which it has led. But we would most respectfully inquire whether it might not be possible to carry similar vigilance a step further, and to remove one or two notorious persons from the list before they have graduated in honours at the Old Bailey. When a man is actually undergoing a criminal sentence, it matters little to any one whether he is a Member of the Royal College of Surgeons or not; but a career tending to the former distinction might sometimes be nipped in the bud if the higher officials of the profession were empowered to warn and to punish before A 22 could legitimately interfere."

The idea expressed in this note applies no less to the practice of pharmacy than it does to that of medicine; in both cases a judicious regard to the axiom that "prevention is better than cure" might do much to remove professional abuses, and to do away with trade grievances.

It appears from evidence given before the Commons' Select Committee on the Abyssinian Expedition that at the sale of surplus stores the loss on medicines alone amounted to £35,829.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A General Meeting of the Association was held on August 12th, 1870, at the Philosophical Institution; Mr. Stoddart, President, in the chair.

After some routine business, the President called the attention of the meeting to the special business of the evening, namely, the presentation of the prizes to their young friends who had been successful in the recent examinations. The Committee, as the meeting was probably aware, had offered a series of prizes, two in each subject upon which they had been able to arrange a course of lectures. These subjects had been inorganic chemistry, organic chemistry, structural botany and systematic botany. Each course had been complete in itself, consisting of about thirty lectures. They were the courses delivered by Mr. Coomber and Mr. Leipner in connection with the Science and Art Department of the Government, and the examinations were those conducted by Dr. Frankland and Dr. Thomson on behalf of the Department. The officials had supplied this Association, at the request of its Honorary Secretary, with a list of its Associates who had been examined, arranged in the order of the merit of their papers. The result, on the whole, had been highly satisfactory. A large amount of industry and steady application had been manifested by some of the students, one particular illustration of which he could not refrain from mentioning. His young friend Mr. Milton lived at a distance of over five miles from Bristol, and he had walked in and out for each lecture, and had missed none. He had thus walked 600 miles for his chemistry alone. He was very glad to find Mr. Milton's name among the prize-winners. He then called upon Mr. Coomber, Professor of Chemistry, to read his report, which was as follows:—

"Gentlemen,—Your students received two courses of lectures from me during the past session, one on inorganic chemistry and a second on organic chemistry. The first course embraced the chemistry of the non-metallic elements, the second the more important classes of organic compounds. Twenty-six students commenced the study of inorganic chemistry, and twelve presented themselves for examination; nine commenced the study of organic chemistry, and eight presented themselves for examination. Of the twelve who offered themselves in inorganic chemistry, four appeared in the first class, seven in the second class, and one failed; of the eight who offered themselves in organic chemistry, four appeared in the first class, three in the second class, and one failed. The attention and persevering industry of those young men who offered themselves for examination cannot be too highly spoken of. There were others equally diligent, whom circumstances, much to their own annoyance, prevented from attending the examination. Still, in most cases, attendance at the examinations may be taken to be a fair test of the assiduity of a student. The attendance in many cases has been very regular; some students have not been absent on a single occasion, and amongst these Mr. Milton deserves to be mentioned, as he walked in to the lectures from a country village five miles distant from Bristol."

The following are the questions that were put at the Examination. The value attached to each question was the same, and three hours were allowed for each paper:—

INORGANIC CHEMISTRY.

Examiner—Professor Frankland, Ph.D., F.R.S.

First or Elementary Stage Examination.

You are only permitted to attempt *eight* questions. You may select these from any part of the paper.

You are requested, whenever possible, to express the reactions in equations.

You are to give such numerical details as will show the mode of calculation.

1. Explain how you would demonstrate experimentally that water is formed by the combustion of hydrogen in air.
2. What is meant by the atomicity or equivalence of an element? Give the atomicity of all the non-tallic elements.
3. What do you understand by the terms "element," "oxide," "metal," and "non-metal"?
4. One litre of nitrogen gas, measured at 0° C., and 760 mm. mercurial pressure, weighs 14 criths; what is the weight in grains of one cubic metre of the same gas measured at the same temperature and pressure?
5. Mention the composition of Ozone, state its properties, and describe how you would prepare it.
6. How would you demonstrate experimentally the composition of water and of air?
7. Classify the following substances into elements and compounds:—

Epsom salts.	Calomel.	Iodine.
Copper.	Nitre.	Lead.
Bronze.	Tin.	Brass.
Chalk.	Graphite.	Diamond.

8. Give the names of the substances denoted by the following chemical formulæ:—

OH_2	HCl	Cl_2
N_2O_5	B_2O_3	HO_3Cl
O_3	SO_2	NH_3

9. Give the symbolic formulæ of the following substances:—

Water.	Ozone.	Sal-ammoniac.
Perchloric acid.	Hydroxyl.	Boric anhydride.
Sulphuric acid.	Carbonic anhydride.	Hypochlorous acid.

10. What is the specific gravity of ammonia, that of hydrogen being taken as unity?
11. How would you show experimentally that hydrochloric acid consists of hydrogen and chlorine?
12. I add two volumes of oxygen to one volume of each of the following gases; what takes place, and what effect will be produced, if an electric spark be afterwards passed through each of the mixtures?—

Chlorine.	Nitric oxide.
Hydrogen.	Carbonic oxide.
Sulphuretted hydrogen.	Carbonic anhydride.
Nitrous oxide.	

ORGANIC CHEMISTRY.

First or Elementary Stage Examination.

You are only permitted to attempt *eight* questions. You may select these from any part of the paper.

Whenever possible, you are to express the reactions in equations.

You are to give such numerical details as will show the mode of calculation.

Atomic weights to be used:—H = 1; O = 16; C = 12.

1. Give the formulæ and percentage composition of formic acid and oxalic acid.
2. Give two distinct and different processes for the preparation of ethylene, showing all chemical changes by equations.
3. What is the empirical formula of a substance which yields the following results on analysis?—

Carbon	20·00
Hydrogen	6·66
Oxygen	26·67
Nitrogen	46·67
	100·00

4. Give the graphic and symbolic formulæ of the following substances:—Prussic acid, acetic acid, alcohol, methyl, and marsh gas.
5. What member of the alcohol family is found amongst

the products of the destructive distillation of wood; how can you extract it in a state of purity from wood naphtha, and what is its graphic formula?
6. How can you detect the presence of nitrogen in an organic substance?
7. You are required to make 1 oz. of lactic acid from milk; how will you do it?
8. Give the name and graphic formula of a member of each of the following families of organic compounds:—Alcohols, aldehydes, ethereal salts, ethers, and haloid ethers.
9. If a mixture of acetate of potash, caustic soda, and quicklime be heated to a temperature somewhat below redness, what gaseous product is obtained? Give its name and formula, and state where it is met with in nature.
10. You have given to you the following materials, and are required to make acetic acid; state exactly what operations you will perform, and explain all chemical changes by equations:—

Ethylic iodide.	Water.
Sodic carbonate.	Potassic chromate.
Quicklime.	Sulphuric acid.

11. If an alkaline solution of potassic cyanide be boiled, what decomposition takes place?
12. If bitter almonds be macerated in warm water, what member of the aldehyde family is produced, and why is this aldehyde not formed when sweet are substituted for bitter almonds?

Mr. Schacht then asked permission, in the absence of their Professor of Botany, who was unfortunately abroad, to say a few words about the botanical classes, which he had himself attended and watched with some care. He said it was certainly to be regretted that the results of the Examinations in this part of their scheme had not been so favourable as in chemistry; and it was clear the interest felt in it had not been so great. The attendance, which, at the commencement of the course, had averaged about twenty at each lecture, dwindled, after a short time to ten or twelve. In the "Structural and Physiological" course, eight only had entered for the Examination, and two only had passed; and in the "Systematic and Economic" course, five only had entered, and two only had passed. In seeking for an explanation of these somewhat unfavourable facts, he was bound to say he could not attribute them in any way to their very excellent teacher, Mr. Leipner, who, on the contrary, had been most assiduous in his work and most anxious to advance his pupils; but he thought they might be, in part at least, due to the difficulties under which both professors and students of botany lay in the winter season, when so few illustrations of the subject can be obtained—a difficulty he would venture to compare to an attempt to lecture upon chemistry without the display of experiments. He might add that the Committee had already discussed the desirability, in their next Session, of making botany a summer course. Truth, however, compelled him to say they all felt some disappointment at the result of this part of their experiment, which, it must not be forgotten, was of quite as much importance in the practice of their profession as chemistry. He hoped next year to witness greater botanical zeal amongst their young friends.

VEGETABLE ANATOMY AND PHYSIOLOGY.

Examiner—T. Thomson, M.D., F.R.S.

First or Elementary Stage Examination.

You are only permitted to answer *six* questions.

1. How does the root differ from the stem in structure and function?
2. What are the appearances presented by a transverse and longitudinal section of the trunk of an oak? Explain the terms sapwood and heartwood. Which of the two is the more durable, and why?
3. What are spiral vessels and ducts? In what part of the plant are they chiefly found? In what plants are they absent?
4. Define the terms anatropous, campylotropous and orthotropous, and name one or two examples of the occurrence of each.
5. Explain the terms hilum, chalaza, raphe, arillus, and give the relative position of these parts (when present) to each other in the three cases named in the preceding question.
6. Describe the process of respiration in plants.
7. Point out the principal differences between exogens and endogens.

SYSTEMATIC AND ECONOMIC BOTANY.

Examiner—T. Thomson, M.D., F.R.S.

First or Elementary Stage Examination.

You are only permitted to answer *seven* questions, two of which must be 8 and 9.

1. In what Natural Orders of British plants is the placentation parietal?
2. Give the characters of the Natural Order *Rosaceæ*, and point out how it differs from *Leguminosæ*.
3. To what Natural Order does the genus *Clematis* belong? What are its characters? State in which of them it agrees with, and in which of them it differs from, the other British genera of the Order.
4. Define the terms raceme, spike, catkin, umbel, capitulum, panicle, corymb, and give an example of each taken from a British plant.
5. What is estivation? Enumerate the different kinds, and give one or more examples of each, taken from British plants.
6. To what Natural Order do the plants yielding tea, coffee, and chocolate belong? What part of the plant is used in each case? Give a sketch of the mode of preparation of each.
7. To what Natural Order do the following useful products belong? What is their use, and what part of the plant yields them? Marsh-mallow, taraxacum, cucumber, hops, tobacco, colchicum.

8, 9. Describe the two plants laid before you, taking their organs (when present) in the following order:—

Stem.	Sepals.	Ovary.
Leaves.	Petals.	Fruit.
Bracts.	Stamens.	Seeds.

The lists furnished by the officers of the Science and Art Department, South Kensington, were then read, and arranged in the order of merit in which the candidates passed their examinations, from which it appeared that the following gentlemen became entitled to the prizes:—

Chemistry.	Botany.
Inorganic.	*Structural and Physiological.*
1. Mr. A. W. Little.	1. Mr. A. W. Little.
2. Mr. W. D. Tamplin.	2. Mr. T. Milton.
Organic.	*Systematic and Economic.*
1. Mr. T. Milton.	1. Mr. A. W. Little.
2. Mr. W. D. Tamplin.	2. Mr. T. Milton.

The Prizes were then presented by the President,—Mr. A. W. Little receiving a microscope, value £3. 3*s.*; Mr. T. Milton a prize of books, value £2. 2*s.*; and Mr. W. D. Tamplin a prize of books, value £1. 1*s.*

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Half-yearly Meeting of the above Association was held at St. George's Rooms, Rutland Street, on Friday, August 5th, 1870; the President, Mr. J. Young, in the chair.

The Treasurer (Mr. E. H. Butler) read his financial report, and explained that the smallness of the balance in hand was accounted for by the fact that several subscriptions due from honorary members had not been collected, in order that their acknowledgment might appear in the balance-sheet of the next half-year, in which session the subscriptions of the majority of the honorary members would become due.

Treasurer's Balance Sheet for the Half Year ending August 5, 1870.

Dr.	£.	s.	d.
To Balance brought forward, February, 1870	1	6	7
„ Annual Subscriptions of 2 Honorary Members at 10*s*. 6*d*.	1	1	0
„ 14 Assistants' Half-yearly Subscriptions at 3*s*.	2	2	0
„ 11 Apprentices' Half-yearly Subscriptions at 2*s*.	1	2	0
„ Allowance off Printing	0	1	3
„ Cash from Library Fund for Hire of Books	0	5	4
„ Ditto for Fines	0	4	3
	£6	2	5

Cr.	£.	s.	d.
Printing Reports and Rules	0	15	0
Printing Lecture Cards, etc.	0	10	0
'British Pharmacopœia'	0	4	6
Chemicals and Apparatus	0	8	2
Incidentals	0	3	0
Rent of St. George's Rooms from January 1 to June 30, 1870	3	15	0
Cash in hand	0	6	9
	£6	2	5

H. Cooper, W. B. Blunt, } *Auditors.*

The President then called upon Mr. W. B. Clark (Honorary Secretary) to read his report, from which it appeared that during the session nine members of the Association (forming more than 35 per cent.) had passed eleven examinations of the Pharmaceutical Society, as follows,—three Minor, two Modified and six Classical or Preliminary examinations. This highly satisfactory result, the Committee think, has not its equal in any similar Association.

Classes have been conducted by the more efficient members of the Association during the session upon chemistry, materia medica, botany, Latin, and arithmetic. Scientific papers have also been read by several gentlemen upon interesting subjects, to whom the best thanks of the Association are due. Forty-eight meetings have been held during the half-year, which have afforded great facilities for the improvement of the members, and have been well attended.

In acknowledgment of the services rendered to the Association by Mr. Edward Atkins, B.Sc., and Mr. R. Weaver, C.E., those gentlemen were elected honorary members.

The following gentlemen were elected as the Committee for the ensuing half-year:—

*Mr. Jos. Young, *President;* *Mr. W. E. Hill, *Vice-President*; Mr. S. H. Cadoux, *Honorary Secretary;* *Mr. E. H. Butler, *Treasurer;* *Mr. W. B. Clark, *Mr. W. B. Blunt, and Mr. E. Green.

The Committee desire to express their thanks to Professor Attfield, Ph.D., and to the Rev. R. Harley, F.R.S., for their kind services in forwarding the respective examination papers for the chemistry and arithmetic classes.

A programme of the arrangements for lectures, classes, etc., from the present time up to February, 1871, has been issued.

* Associates of the Pharmaceutical Society.

Proceedings of Scientific Societies.

GRANT COLLEGE MEDICAL SOCIETY, BOMBAY.

July, 1870.

A New Indian Remedy.

BY MR. NARAYAN DAJI, *Graduate of the Grant Medical College.*

(*Continued from page* 156.)

Medicinal Properties and Uses.—From the Natural Order to which this tree belongs, it may be inferred *à priori* that it would possess the characteristic properties of that Order, and this is found from experiment to be true. The medicinal and physiological properties of this tree resemble so closely those of the officinal *Picræna excelsa*, or Jamaica Quassia-tree, that our Indian plant may safely be considered a substitute for it. As *Ailanthus* bark owes its efficacy to the ailanthic acid contained in it, there is scarcely any difference of action between the two except in the dose.

Physiological Effects of Ailanthic Acid. (a.) *On Vegetables.*—In a strong aqueous solution of the acid the leaves of *Hydrocotyle Asiatica* were immersed, and kept there for about eighteen hours without any appearance of contraction, or other perceptible change in the leaves.

(b.) *On Animals.*—Monads (*infusoria*) developed during the decomposition of hay in water, were placed in a dilute watery solution of the acid and examined under a microscope, when their motion became less active, and they were observed to perform a kind of rotatory motion round themselves. When a stronger solution was added to a drop on the plate, the animalcules became motionless, contracted and died, showing the poisonous influence of the acid.

Common flies avoid touching the acid, even if it is mixed with sugar; but how far it proves poisonous to them is a matter of question. No poisonous effects were perceptible by its internal administration to a hen: nineteen grains of the acid were given in a single dose.

(c.) *On Man.*—In doses of from one to three grains ailanthic acid, when given internally, acts as a tonic and stomachic, exciting the appetite and promoting digestion. When given continually in larger doses (from grs. iii to grs. v two or three times a day) its digestive and alterative action is distinctly marked, especially in cases of torpid states of the digestive function attended with muscular and nervous relaxation and constipation. It increases secretions, especially that of the liver, as indicated by the stools changing their colour to yellow, improves the tone of the muscular and nervous system, and produces a corresponding healthy change in the general system. Although it much resembles the pure bitters, such as gentian or chiretta, yet its action is specially marked by a peculiar stimulation of the digestive and secretory processes. In larger doses (from grs. xv to grs. xxx) it is apt to occasion uneasiness about the stomach, nausea, vertigo, vomiting and purging, but without any distressing symptoms. It does not produce narcotism, its powers being chiefly directed towards the sympathetic system. It does not exhibit antiseptic properties when placed in contact with dead animal or vegetable matter. It does not prevent coagulation of blood.

The dry ailanthate of lead acts as a sternutatory, causing an irritant effect on the mucous lining of the nose.

Therapeutic Uses.—In dyspepsia, anorexia and torpid states of the digestive organs, accompanied with habitual constipation, ailanthic acid has been found very serviceable. It is particularly useful in cases where the indigestion results from a want of tone in the general system, such as occasionally occurs in the convalescence from fevers, and from the frequent use of purgatives. Its beneficial effects in these cases have been more marked than those from the use of other ordinary bitter tonics.

In hæmorrhoids and *prolapsus recti*, it can be advantageously administered in combination with other remedies which are employed with the view of freeing the portal circulation.

In watery diarrhœa, brought on either from errors of diet or changes of temperature, or sedentary habits, and which is characterized by a catarrhal state of the mucous lining of the stomach and bowels, this remedy proves very useful; it arrests the exhalations from the mucous surface, and restores the secreting functions. In the catarrhal diarrhœa of children I have seen remarkably good effects from the use of it. In diarrhœa attendant on inflammatory causes it is found comparatively inefficient.

In cholera, it has been found of considerable benefit, especially when given in the first stage, when it appeared to have considerable power in preventing the disease from passing to its second stage. It has been also observed that it checked vomiting and purging sooner than the ordinary remedies, and to have changed the colour of the stools to yellow without the use of mercurials. It did not, however, prove effectual in severe epidemics.

In intermittent and remittent fevers, it was found to have considerable febrifuge powers; its beneficial action in these cases depended more on its property of restoring and augmenting the checked secretions, than from any sedative effects on the vascular or nervous systems. Its antiperiodic properties are not trustworthy, but are much more marked than those of several other bitters. It proves very useful as an alterative in reducing the congestion of the liver and other organs often met with in these disorders. In fevers complicated with brain symptoms and accompanied with derangement of the stomach and liver, I have often found it very beneficial.

In general debility from various causes, complicated with an atonic state of the digestive organs, it proves a very valuable tonic and alterative, and may be advantageously combined with preparations of iron.

In rheumatism and gout its use was found of considerable benefit by improving the state of the digestive function, a point of great importance in the treatment of these diseases.

In "elephantoid fever," attended with recurring inflammation of the scrotum (varix lymphaticus), and chylous condition of the urine, the continued administration of this remedy has a marked effect in checking the progress of the disease. Its use in this disease is deserving of further trial.

I have not observed any decided anthelmintic properties from the use of it.

Administration, Preparations, and Doses.—*Ailanthus* bark* can be best prescribed in the form of decoction, infusion, extract, or tincture. The following formulæ were used for the different preparations:—

Decoction of Ailanthus Bark.—Take of *Ailanthus* bark bruised, four drachms; distilled water, one pint; boil for ten minutes in a covered vessel, then strain and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

Dose.—From one to two fluid ounces twice or thrice daily. It contains ailanthate of lime.

Infusion of Ailanthus Bark.—Take of *Ailanthus* bark, bruised, two drachms; cold water, ten fluid ounces. Infuse in a covered vessel for half an hour and strain.

Dose.—From one to two fluid ounces twice or thrice daily. It is a cleaner preparation than the decoction; often prescribed in dyspepsia.

Tincture of Ailanthus Bark.—Take of *Ailanthus* bark, bruised, one ounce and a half; proof spirit one pint; macerate for seven days in a closed vessel with occasional agitation; then strain, press, filter, and add sufficient spirit to make one pint.

* The bark should always be deprived of its thick epiphlœum before use.

Dose.—From half a drachm to two fluid drachms.

Extract of Ailanthus Bark.—Take of *Ailanthus* bark, bruised, one pound; distilled water a sufficiency. Macerate the bark with eight fluid ounces of the water for twelve hours; then pack in a percolator and adding more of the water, allow the liquor slowly to pass until the bark is exhausted. Evaporate the liquor; filter before it becomes too thick; and again evaporate by water-bath until the extract is of a suitable consistence for forming pills.

Dose.—From three to five grains, either alone or combined with other tonics or alteratives.

History.—The bark of this tree appears to have been in use as a bitter tonic and alterative amongst the natives of India from the earliest periods. The juice of the fresh bark has been regarded by them as a valuable remedy against indigestion and diarrhœa. The juice of the leaves also is occasionally administered by them in bronchitic affections as an emetic. The tree, however, is not known to the generality of natives, nor is its account and identification accurately given in Hindu works on materia medica.*

The native vaidyas (physicians) on this side of India are ignorant of the medicinal virtues of the tree. In Southern India it appears to be more extensively known, for Dr. Ainslie says, "This bark has a pleasant and somewhat aromatic taste, and is prescribed by the native practitioners in infusion, in dyspeptic complaints to the extent of three ounces twice daily." †

In allusion to this Dr. Wight says, "In confirmation of that statement I may add that some time ago specimens of this plant were sent me, as those of a tree, the bark of which is prescribed in the Circars as a powerful febrifuge and tonic in diseases of debility." ‡

Royle, O'Shaughnessy, Piddington, Roxburgh, Drury, and other writers on Indian plants that I know of do not allude to the medicinal virtues of this plant; and Waring reiterates, in the Pharmacopœia of India, the statements already made by Ainslie and Wight.

(*To be continued.*)

SOCIETY OF ARTS.§

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture I.

I have sometimes wished, when building castles in the air, that I could, after a few hundred years, come back and see the state of science at that time. I am convinced that those who will look back, from such a period as a few hundred years hence, at the present state of our knowledge of nature, in any one department, will be surprised at its smallness; in fact, even now, when we work at all earnestly at any one part of the field of nature, we cannot refrain from feeling how little is our knowledge compared with our ignorance. But, if that is generally the case, I think it is peculiarly the case in those studies in which life is concerned; and the phenomena of fermentation have that peculiarity that they consist of processes in which vital organisms

* *Aralu* is the Sanskrit name of this tree according to Ainslie (*vide* 'Materia Indica,' vol. ii. p. 302); but on this side of India that name is a synonym of "*Tetú*," or *Calosanthes Indica* (Bignoniaceæ), as appears from several Sanskrit compendiums of medicinal plants and drugs, viz.:—Chúdámani, Dravyaratnákara, Bhávaprakás'a, etc. The properties and uses of *Aralu* there mentioned are applicable more to *Calosanthes Indica* ("Tetú") than to the tree under consideration.

[*Aralu* is also the vernacular name for *Terminalia chebula.* (*Vide* Moon's Cat.)—Ed. Ph. J.]

† Ainslie's 'Materia Indica,' vol. ii. p. 302.

‡ Wight's Ill. Ind. Bot., p. 170.

§ Cantor Lectures.

are concerned, and in which there is every reason to believe that vital organisms, or living beings, take an active and leading part. I need not say that, for that reason, the explanations which we have, even of the simplest and best known of the phenomena of fermentation, are, as yet, mere sketches of the reality. It is, however, not the less useful or the less important to know them for that reason.

When we chemists are classifying substances, we adopt a principle of classification which I think is almost inevitable, but it may be as well that I should mention what it is. We put the simple things together, and the complex or difficult things together, and then we try to put between them, in as regular an order as possible, the intermediate links of the chain by which they can be connected; and I believe that our best—I might almost say our only—explanations consist in thus arranging, in a natural order, the facts which we have to consider, and then viewing them, and stating what we see, in the clearest and least ambiguous terms. Now, the term "organic," as applied to a certain class of chemical substances might be replaced—and I think, for some purposes, ought to be replaced—by the term "complex." The substances which we are in the habit of including under the term organic are peculiarly complex; in fact, they are the most complex with which we have to do. The phenomena of fermentation relate mainly to them, and consist principally of a process of change,—the breaking-up of those organic bodies into rather less complex substances than themselves,—a process of partial analysis. Of course, when I say that, I give what I conceive to be a characteristic idea of the general method, and I must not be supposed to assert that all processes of fermentation are analytical.

Amongst the characteristics which, I think, are particularly useful and interesting, as serving to distinguish organic from inorganic, complex from simple substances, is their different behaviour under heat. I have found it exceedingly interesting and instructive to bear in mind the fact that while simple and inorganic compounds, as we generally call them, are sometimes destroyed and resolved into other compounds by the action of a high temperature, yet many of them are not. Amongst inorganic substances we find some which are broken up or changed by exposure to a high temperature, but there are others which can stand even the highest temperature without undergoing any permanent change, that is to say, they return, on cooling, to the same state in which they were before the heat was applied. With organic substances that is not the case. All organic bodies are broken up into minute particles, and assume new arrangements, when they are heated to a sufficiently high temperature; and that is, I think, a distinction which is of considerable theoretical as well as perhaps of some practical importance.

The processes of breaking up which are effected by heat upon organic bodies are, in the very great majority of cases, different from those which are effected by the action of these wonderful little organisms, the ferments; and it is a peculiarity of the action of the ferments that they effect the breaking up—the analysis—of complex organic substances, and form products which, for the most part, we have obtained from those materials by no other process.

Amongst the processes of fermentation, there is one which, from its pre-eminent importance, and from the fact that we have had occasion to study it more fully than any other, ought to be first mentioned. I allude to the process of fermentation by which alcohol is formed artificially. I may say, indeed, it is the only process by which alcohol is ever made. It is a process which consists in breaking up some kind of sugar, for sugar is a word which, although popularly restricted to one particular substance, which is extracted sometimes from the sugar-cane and sometimes from beet-root, is used by chemists in a more general sense, serving to characterize a family of bodies which have much in common with one another, being for the most part all of them sweet, and containing the same elements, but in slightly different proportions. They all possess many properties which are of some importance. These different kinds of sugar are broken up by the action of ferment into alcohol, and also into another product, carbonic acid gas, which has been long known, and for a long time the process of alcoholic fermentation was supposed to consist simply in a separation of sugar into these two products, alcohol on the one hand and carbonic acid on the other. A more careful examination of the products has shown, however, that these two never appear alone. I believe I may safely say, from the researches of Pasteur and others, that no case of the formation of alcohol by fermentation has been known to occur in which several other products have not been formed simultaneously with these two. With regard to the difference of properties of these two bodies, there are one or two points of some little interest, especially this one, that whereas alcohol is an eminently combustible substance, and is well known to have properties of that kind, being frequently used as fuel, on the other hand, carbonic acid, the other chief product, is completely burnt; it is a substance incapable of undergoing any chemical change whatever analogous to combustion. Alcohol is a substance which I need not show you, although in its pure state it is not very common; but I will, in order to remind those of you who may be less familiar with its leading properties, make a little carbonic acid by a short process. I will put a little muriatic acid upon some white marble, and the apparent ebullition which you see takes place is known to you all as due to the liberation of carbonic acid. You might imagine the thing to be fermenting, only that the process in that case would be less rapid. Now, if I plunge this little burning paper gradually into the jar containing the carbonic acid, it will burn more and more faintly, and get extinguished when it enters the gas; it is totally impossible to set fire to the gas. And there is one other fact that we may notice at the same time—the great specific gravity which characterizes this gas. I will show you that, in this way. I will go through the motion of pouring from this jar containing it into another smaller jar, and no doubt the heavy carbonic acid will pass from the jar in which I first collected it into the lower one, where we shall find it by means of the taper as before. You see that, on lowering the lighted taper into this small jar it is extinguished as it was before. I will show you the test by which we usually discover the presence of carbonic acid. I have here some water containing lime in solution,—some lime-water,—and I will pour it into the large beaker glass, in which there is probably still some carbonic acid left. You see the solution immediately becomes turbid, or, as we express it, a precipitate is formed by the combination of the carbonic acid with the lime-water. A compound is formed, which is nearly insoluble in the water, called carbonate, which goes down as a precipitate.

In addition to alcohol and carbonic acid, I ought to mention another kind of alcohol, which occurs to a considerable extent in some distilleries where raw grain or potato-starch is used. This substance imparts to the product a very unpleasant odour, and some unwholesome qualities. It is known by the name of fousel oil. It does not mix with water, and if I were to pour some of it on water it would float, without dissolving to any considerable extent. There are some other products which are even more interesting and important; two especially I ought to mention. One is the clear substance which you see in this bottle, and which you might imagine to be oil; it is a fluid largely made now, and known by the name of glycerine, but in chemical language I should say that this was an alcohol. It is a substance which, by tasting, you might mistake for sugar, for it possesses a sweet taste, resembling sugar, but, to chemists, it is a kind of alcohol, and its appearance during fermentation together with ordinary alcohol is no doubt due to a process of the normal kind.

Another product which I might compare to the carbonic acid which I just now showed you, is this beautiful crystalline acid substance, which has been long known by the name of succinic acid. It got that name from the fact that it was originally prepared from amber. By subjecting the amber to dry distillation, succinic acid, among other products, is formed. Glycerine and succinic acid, as well as common alcohol and carbonic acid, are always formed when any kind of sugar is made to decompose by the process which is termed alcoholic fermentation; and it is seldom that there are not other —and probably, in smaller quantities, several other— products formed besides those four. In fact, the different kinds of spirit which are obtained by the process of fermentation and subsequent distillation,—I mean those kinds of spirit to which no artificial flavouring material is added (gin is a general name given to certain spirits which are flavoured by artificial means), such as brandy, rum, and others,—owe their distinctive peculiarities to the presence of small quantities of volatile substances which are formed during the process of fermentation, regarding which a good deal has been observed, and several important facts have been collected.

There is another process of fermentation which I must mention, for it is important from its frequent occurrence, and that is a process by which another kind of sugar usually, but sometimes common sugar, is transformed. The substance which most naturally undergoes this fermentation is milk-sugar. These hard lumps in this bottle, which if you were to take out and taste, you would not imagine to be sugar, are made by the crystallization of the solid substance in whey. The whey is evaporated carefully to a small bulk, and this substance which results is known by the name of milk-sugar. When a solution of this is mixed with cheese, which is the best ferment for the purpose, it gradually turns acid. I dare say it is known to all of you that milk itself, which contains this body, and cheese, or rather caseine, dissolved with it, together with the fatty globules of milk, when exposed to the air, turns acid. That acidity is due to a change which takes place in the sugar. The sugar disappears gradually, and is transformed into an acid substance of which I have a little bottle here. It is a strong acid, and here in another bottle are a few of its salts,—a lime salt and a zinc salt, which is a very beautiful and characteristic compound. I shall have occasion hereafter to show you a large bottle which is now at work, in which I dissolved, not this particular kind of sugar, but the ordinary sugar. I put with it a quantity of calcic carbonate, and some old, lean cheese, with a considerable quantity of water. The mixture was kept at a temperature above blood heat for some considerable time, and a compound of lactic acid is being formed. That is a process analogous in its general features to the fermentation which forms alcohol, but it is a change of sugar in which no alcohol is formed. Sometimes there is a trace of alcohol, but there is not necessarily any, and no carbonic acid is formed; but instead of these products, the elements of the sugar break up into different groups, and arrange themselves in another manner. That is really the nature of the process, as far as our most careful experiments have gone, and the acid which we make in that way, which is lactic acid, or acid of milk, is really sugar, of which the elements are arranged in a different way, so as to acquire acid properties.

The third process, which I must mention from its remarkable products, is one which, perhaps, in some respects ought rather to be compared with putrefaction, for it is a process which has many of the most important characteristics of putrefaction. In order to deal with the question of fermentation generally, it is necessary to allude to some varieties of such chemical changes which are usually classed under the term putrefaction. As a general rule, I think the characteristic of processes of putrefaction is mainly the unpleasant nature of the products which are formed. It is not long since a distinguished chemist, in speaking of alcoholic fermentation, said that it is really a putrefactive process; and in its intimate nature it is, as far as we know, a process much like the truly putrefactive processes, and different from the processes of eremocausis or oxidation. This other process to which I allude consists in forming the acid substance which I have here, and which I will not open, because it is not a very pleasant body. It is a substance which is known, although I believe not very commonly, in butter. The peculiar rancid odour which butter acquires when it is kept too long, especially in warm weather, is due to a transformation of some of its materials into this particular acid, which Chevreul, a very distinguished French chemist, separated from butter, and he named it from that circumstance butyric acid. If we leave some of this product of the last fermentation—some of this lactate of lime, the lime salt of lactic acid—under the same conditions in which it was formed, that is, if we leave it in the same vessel in which it had been formed from the milk or sugar, and leave cheese with it, and keep the mixture warm, the lactate will gradually decompose, and carbonic acid will be given off together with hydrogen gas, and at the same time we find that the lactic acid will be decomposed. and in place of it we get this butyric acid, and generally some valerianic acid and a little acetic acid.

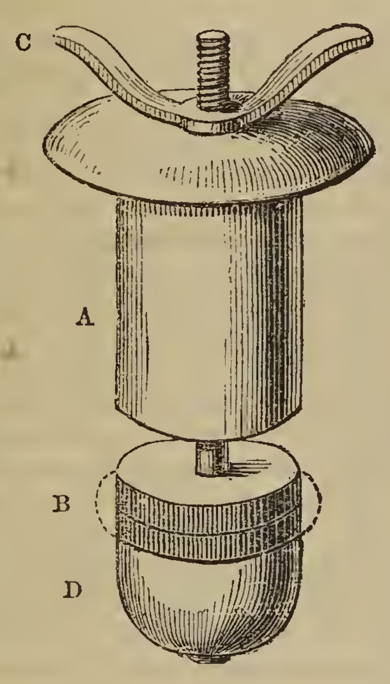
Amongst the processes which really are analogous to fermentation in their nature, but which differ in one particular, I must mention one other, the process of forming vinegar, or acetic acid. This large bottle contains vinegar in a form which most of you, I dare say, have not seen. These fine white crystals are the pure substance which, mixed with water in an impure state, are generally known by the trivial name of vinegar. We call that acetic acid, or hydric acetate. The formation of this body from alcohol represents a variety of fermentation which is of considerable importance and of frequent occurrence. Everybody who has noticed the process which takes place when animal or vegetable matter is left to itself in contact with air, especially in moist localities, must have observed that there is a gradual disappearance of the organic matter. For instance, if you leave a piece of wood in a moist place, under certain conditions of very frequent occurrence which are favourable to this process, the wood gradually gets soft, and becomes transformed into a brown substance, and if you leave it long enough—in this country, several years generally would be needed for this purpose—it gradually disappears. If you were to put a piece of that decomposing wood into a closed glass vessel, and examine the air above it, you would find that the wood was really burning. I am using the word combustion in the ordinary chemical sense—I mean by that word that the oxygen of the air which you have enclosed with the wood is being taken up by the wood, and the products of combustion, carbonic acid and water, are being formed from the substance of the wood. One great class of the processes of fermentation is of that kind. They consist not in a mere breaking up of the materials already contained in the organic substance, but a change of their arrangements, which is due, more or less, to the absorption of oxygen, and this formation of acetic acid or vinegar is a case of that kind. In fact, if we were to leave some ordinary fermented wort in an open vessel, so that the alcohol were left there in the mixture in which it had been formed, we should find that the alcohol would gradually disappear and give place to an acid substance. The process is well known to wine-makers and to brewers, and their art consists, amongst other things, in the avoidance of this process of the oxidation of their alcohol.

While the acetic acid is being formed, oxygen from the air is taken up, and in that respect this process of acetic fermentation differs from the other three processes of fermentation which I have described. When you make alcohol and carbonic acid from sugar, the air takes no part in the process; when you make lactic acid from the sugar, the air is not wanted; and when you make butyric acid from lactic acid, then again the air may be completely excluded and the process will go on without it. But when you make acetic acid from alcohol, you must of necessity allow the free and continuous access of air, and the air gives up some of its oxygen to this fermenting alcohol, to transform it into acetic acid and water by a true process of fermentation.

(*To be continued.*)

CORK FOR POISON BOTTLES.

The accompanying drawing represents a very ingenious contrivance, which has also the merit of being simple. The wooden stopper A has a pin passing through it, one end of the pin being fixed to the plug D, while the other is screwed, so that, by means of the winged fitting C, the stopper A can be forced downwards until it compresses the caoutchouc rings B, making them bulge out laterally (as shown by the dotted lines) and press against the neck, so that the cork cannot be removed until the winged fitting C has been screwed upwards to relieve the pressure.



Lead in Tinfoil.—Tinfoil very rarely indeed consists of pure tin; generally it contains more or less lead. According to the resent analysis of August Vogel, who has examined a great number of samples from very different sources, it contains from one to nineteen per cent. of lead. There are, however, specimens of tinfoil which contain so little lead that it hardly gives a reaction with the appropriate tests. Since tinfoil is so much used for covering articles of diet or of confectionery or of perfumery, it was a matter of some degree of interest to determine whether or not there was any danger of transference of lead from the wrapper to the contents. A number of experiments on soap, chocolate and different kinds of dry sugar, which had been enveloped in tinfoil very highly charged with lead, showed that there was no contamination with lead. Cheese, on the other hand, on account of its being moist and being closely in contact with the foil, did take up lead. Of course the lactic acid of cheese would also favour the taking up of the metal. A point worthy of being recorded in connection with this matter, is the rapid diminution of the lead towards the centre of the cheese. Often plenty of lead was found in the rind and none a little way in the cheese.—*Repertorium für Pharmacie, von Buchner.*

Capsicine.—The fruit of the *Capsicum annuum* contains an alkaloid analogous to conia. The peculiar smell of this alkaloid is recognizable when extract of capsicum is warmed with potash.—*Répertoire de Pharmacie.*

The Chinese in America.—Lum Ling Wau, a native Chinese physician, proposes to settle in New York, and enter upon the practice of his profession. He brings with him his wife; an interpreter, Lu Sing; two Chinese apothecaries, Ah Mok and Ah Sam, and an endless assortment of drugs and medicines.—*Philadelphia Medical and Surgical Reporter.*

BOOK RECEIVED.

THE DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE. No. XCIX. Dublin: Fannin and Co.

We are indebted to correspondents for the following periodicals, containing news' reports, and other matters of pharmaceutical interest:—The 'British Medical Journal,' Aug. 20; 'Nature,' Aug. 18; the 'Chemical News,' Aug. 19; the 'English Mechanic,' Aug. 19; the 'Grocer,' Aug. 20; the 'Chemist and Druggist,' Aug. 15; the 'Chemists and Druggists' Advocate,' Aug. 20; the 'Medical Press,' Aug. 24; 'Gazette Médicale d'Orient,' for June:—from the respective publishers; 'Correspondence with the Board of Trade from Mr. F. H. Breidenbach.'

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

PROFESSOR REDWOOD'S ANNUITY.

Sir,—I am very sorry to find, from the report of the last Council Meeting, that some objection has been made to the annuity granted by the Council of the Pharmaceutical Society to Dr. Redwood. In addition to the annuity, allow me to suggest that a fund be raised to secure to the worthy Professor one hundred pounds per annum, as a mark of respect for his arduous labours in the advancement of pharmacy, and his unwearied interest in the welfare of Pharmaceutical students.

I am respectfully yours,
H. J. HALLIDAY.

Manchester, August 16, 1870.

Sir,—I think the thanks of the whole members of our Society are due to those gentlemen, especially Mr. Woolley, who so strongly, but unavailingly, resisted the motion for an annuity to Mr. Redwood; not that I for one moment wish it to be thought I undervalue the great service and ornament he has been to us all, but this I do think, that it is not just to his fellow-editors for him to be singled out for so signal a mark. Besides I should very much like to know what is the reason of his having been so singled out; perhaps some of those who voted our money away can tell us. If for long services, are there not many men on the Board who have worked as hard and long for the cause? We shall perhaps be called upon to allow them an annuity.

I hope I shall be acquitted of any feeling in the matter other than that of seeing one man, however worthy, picked out of others quite as worthy, and who, if one deserve it, all deserve it.

I am, Sir, yours obediently,
PHARMACEUTIST.

SALE OF DRUGS BY GROCERS.

Sir,—In reference to the remarks from Correspondents in your Journal respecting the sale of drugs by grocers, allow me to offer two suggestions that appear to me likely to go far to lessen the evil.

1st. Let all the chemists of a town or district meet, say one evening in each month, and in a friendly spirit talk over trade matters.

2nd. Let no chemist sell to a grocer any drug at less than the fair retail price. I know an instance of a chemist selling to a grocer 20 oz. syrup of rhubarb for 1*s.* to sell again. As a rule grocers obtain their drugs, in the first instance, from retail chemists, therefore it appears to me we have the remedy in our own hands.

Yours truly,
CHEAP AND NASTY.

Trade Grievances.

Sir,—As a medical man I can thoroughly sympathize with A Country M. P. S. There is no doubt medicine and pharmacy ought both to be elevated into professions instead of presenting the mongrel combinations that exist at present. To do this, the Councils presiding over both callings should be representative in character and executive in action, independent, but at the same time harmonious in combined operations for the welfare of both professions. As we have good models abroad, it ought not to be difficult for our Legislature to arrive at correct conclusions, based on the sound principle of division of labour.

At present our Society of Apothecaries urges a noble and liberal profession to the veriest drug selling, and the chemists in self-defence have to assume a position for which they do not pretend to be qualified, in prescribing for all manner of ailments, at the same time that the greater part have to descend to the meanest trades in order to obtain a livelihood, —at once blasting the noblest aspirations of what should be a body of highly educated, scientific, professional men. As for practical difficulties, I can speak for myself, having practised as what is commonly called a general practitioner for years in more than one neighbourhood, and have always found it an advantage to myself and to my patients to leave my dispensing in the hands of those qualified for the purpose. If the principle is sound, an increased area of operations presents no insuperable difficulties; what is wanted is pressure from above, from those authorized to exercise it; let us therefore individually and collectively agitate for this consummation.

I am, Sir, yours, etc.,

Birmingham. PERCY LESLIE, M.D.

Poison Corks.

Sir,—Many suggestions and various contrivances have been made for the better securing the stoppers of bottles containing preparations of a dangerous character, but I am not aware of any invention yet which has met with such favour as to be adopted by the trade generally. Convinced of the necessity for some precaution, I beg to submit to you a cork which has come to my notice, patented by a Mr. Flemings, of Oxford Street, and which merits some attention, as it can be made to fit any sized bottle, and by its construction would bring any wandering mind to a sense of danger.

I am, Sir, yours obediently,

J. WADE.

*** A drawing of this cork will be found at p. 179.

Pharmaceutical Titles.

Sir,—Your correspondent of last week has, I am sure, the thanks of all those who, like himself, aspire to the Major, and also of those who have attained it, as he clearly points out the justice of allowing those who have passed the Major Examination the title of Fellow, so that others than those connected with the business may comprehend the value of titles so nearly alike, which the majority of people now consider synonymous.

Hoping that the Council will attend to this matter, and, out of simple justice to all, make the title superior, in the proportion that the Major Examination is to the Modified,

I am, Sir, yours obediently,

T. C.

"Rule of Thumb."

Sir,—The question is, which is the most accurate method of dispensing one grain calomel powders, that of weighing each separately, or of weighing a given number, say six, and dividing them by the eye.

If scales were always used delicate enough to turn to the twentieth of a grain, as our first-class dispensers keep them, and if our grain-weights were all of standard quality, it would doubtless be better to weigh each grain separately, at least for inexperienced hands. But I venture to think, in many country districts dispensing scales are not kept up to this high standard of efficiency; the bearings may not be perfectly clean, they may be cleaned and adjusted by unskilful persons. Thus there may be scales used in dispensing that would not turn well even to a quarter of a grain. I used, when in business, to clean my own and test them myself every day. Moreover, when I used to test grain-weights purchased from the makers by a standard set, I frequently found they varied considerably, and had to be adjusted before they could be relied on. Now, by weighing the larger quantity, these possible inaccuracies are reduced to the minimum. If six grains be weighed and vary one quarter of a grain, that variation is divided by six when the powders are carefully divided by the eye, and in the course of the six doses the total taken does not exceed that prescribed by more than the excess which might have accrued on each powder by separate weighing; for since the powder turns or balances the scale, the presumption is in favour of excess rather than of diminution, which excess again would be slightly reduced by the paper, unless glazed paper were used.

Those who are accustomed to use the eye in dividing such powders would probably do so with greater accuracy than by ordinary scales; and in dispensing parts of a grain, such as half, third, or a quarter, I should prefer weighing one grain accurately and dividing, to weighing the fraction itself.

Yours truly,

Plymouth. F. P. BALKWILL, M.P.S.

B. A. (Easingwold).—A very good book for the purpose required is 'How Crops Grow,' lately published by Messrs. Macmillan and Co.

T. M. (Kirkintilloch) will find an answer to his question in the April number (second series), p. 664.

X. Y. (Maidstone).—The preparations are very similar, chloric ether, however, being very variable in strength, and generally weaker than the sp. chloroformi of the B. P.

Messrs. Domeier and Co. (Basinghall Street) have forwarded, on behalf of the German Hospital Committees for the relief of the wounded soldiers of both nations, a circular soliciting donations of "money, carbolic acid (pure and impure), Condy's fluid, permanganate of potash (in substance), quinine, morphia, water-cushions, lint, sticking-plaster," etc.

"Rhatany" (Bristol).—Iron alum is a salt in which peroxide of iron takes the place of alumina in common alum. For the mode of preparation see Watts's Dictionary, vol. iv. p. 596, or any systematic work on chemistry.

T. S. Minett (East Grinstead).—Our correspondent's inquiry in reference to Mr. Schacht's letter shall receive attention.

G. A. (Maidenhead).—No examination is required. Candidates for admission into the Society are proposed according to a form of recommendation, which may be obtained from the Secretaries. The recommendation must be signed by five Fellows, to three at least of whom the candidate must be personally known; and this certificate is read and suspended in the Society's rooms for three ordinary meetings before proceeding the election by ballot.

Inquirer (St. Andrew's).—Probably you will find the information you require in Ure's 'Dictionary of the Arts,' under "Calico Printing."

Mr. Trilfield (Liverpool).—We have received a plan of the arrangement of bottles in his shop.

W. Robinson (Reading).—The guinea retained from the fee of a candidate who fails to pass the examination is forfeited. He must pay the full fee if he presents himself again.

T. H.—Petroleum Act.—The Bill introduced in the House of Lords this Session, for amending the Petroleum Acts, has not passed into law. It was on the 4th instant read a third time and discharged.

ERRATA.—In the list of exhibitors at Newcastle, p. 154,—*for* Krohne and Suzeman *read* Krohne and Sesemann; *for* Mayer and Mottyer *read* Mayer and Meltzer. Page 145, line 26 from top, *for* clearer *read* denser.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

The General Index to the first Fifteen volumes of this Journal may be obtained of the Secretary, 17, Bloomsbury Square, price 2*s.* 8*d.*, post free; bound in cloth, lettered, 3*s.* 8*d.*, post free.

The General Index to the Vols. XVI.–XVIII., Old Series, and Vols. I.–IX., Second Series, may also be obtained of the Secretary, price 3*s.* 3*d.*, post free.

MEDICINAL FERNS.

BY M. C. COOKE.

Ferns have been rather extensively employed in medicine, and some of them have acquired considerable reputation; but it is doubtful whether, with two or three exceptions, they are of any real value. Some are probably inert, others only possess properties which are more highly developed in other substances. On the whole, ferns are by no means important remedial agents, and their enumeration is more matter of curiosity than suggestive of value. The present list, though long, is probably imperfect, at least it contains the most important and popular species.

ACROSTICHUM HUACSARO, *Ruiz.* The rhizome of this species is employed in Peru as "Middling Calaguala," "Cordoncillo" or "Huacsaro." It is substituted for the genuine "Calaguala."

ADIANTUM ÆTHIOPICUM, *Linn.* This is a Cape species. An infusion is sometimes used as an emollient in coughs and diseases of the chest. A syrup is also prepared from it. The Basuto Kafirs, who call it "Ma-o-ru-metsoo," employ its caudex in the shape of decoction for promoting parturition.

ADIANTUM CAUDATUM, *Linn.* An infusion is employed in the Mauritius as a diaphoretic and instead of tea. In some parts of India it forms a portion of the "Hunsraj" of the bazaars, which is used as an astringent and aromatic.

ADIANTUM CONCINNUM, *Kth.* "Culantrillo," or "Jarabe de Culantrillo," is much used in the Caraccas in pectoral diseases, and said to purify the blood. Six ounces of the fronds are macerated in a gallon of hot water for twenty-four hours, then evaporated to a proper consistence and filtered.

ADIANTUM FRAGILE, *Sw.* Named by Lunan as medicinal. Browne says all the species of *Adiantum* are light subastringent vulneraries, and may be administered with great propriety in all relaxations and weaknesses of the fibres, in prurient consumptions and in the ulcerated or relaxed state of the glands, especially those of the breast, as well as in most cutaneous diseases.—*Lunan, Hort. Jam.* i. p. 475.

ADIANTUM LUNULATUM, *Spr.* The "Hunsraj," or "Mobarkha," of the Hindoos has been referred to this species. It is employed in India for similar purposes to the Maiden-hair of Europe, which latter is known under the name of "Gool-i-mairam." Several other species are either mixed with this or substituted for it under the same vulgar name.

ADIANTUM PEDATUM, *Linn.* "Canadian Maiden-hair." This is said to be the most esteemed sort of Maiden-hair, being more aromatic than the European Maiden-hair. It was formerly more employed than at present as a pectoral in chronic catarrhs. Many imaginary virtues have been ascribed to this as well as other ferns.

ADIANTUM TRAPEZIFORME, *Linn.* "Mexican Maiden-hair." One of the numerous species which have been employed for virtues which they were supposed to possess in common with the true Maiden-hair of Europe. It is probably of little or no value.

ADIANTUM VENUSTUM, *Don.* This is another fern said to yield a portion of the "Hunsraj" of Indian bazaars. Considered astringent and aromatic, also emetic in large doses, besides which it is said to be tonic and febrifuge. Employed in Lahore, Kashmir, etc.

ADIANTUM VILLOSUM, *Linn.* One of the species mentioned by Lunan. Piso is said to have recommended it for expectorating tough phlegm.—*Lunan, Hort. Jam.* i. p. 474.

ASPIDIUM CORIACEUM, *Sw.* Bouton states in his 'Medicinal Plants of the Mauritius,' that a decoction of this fern is employed in the treatment of tambave; a few cups of this are given during the day, and the residuum left after the decoction is used as a lotion for bathing the neck, breast and back of the patient at intervals.

ASPLENIUM ADIANTUM-NIGRUM, *Linn.* "Black Spleenwort." The medicinal properties of this fern have been extolled by various old authors, but its use is unknown in modern practice. Ray sums up a catalogue of diseases in which it is supposed to be beneficial.

ASPLENIUM NIDUS, *Linn.* The tender fronds of this species are cut into pieces in the Mauritius and form a decoction which is said to be an excellent depurative. The rhizome is also boiled for coughs. Boughton thinks that this is the *Ceterach* mentioned by Dr. Chapotin as employed in Madagascar.

ASPLENIUM RADIATUM, *Sw.* According to Dr. Birdwood, the "Mor-punkhee" of the Hindoos belongs to this species. It is employed locally in medicine, but its virtues are not specially recorded by him.

ASPLENIUM RUTA-MURARIA, *Linn.* "Wall Rue." Lightfoot says that this fern was at one time sold as an expectorant and deobstruent. It was one of the species employed as a substitute for Maiden-hair.

ASPLENIUM TRICHOMANES, *Linn.* According to Lightfoot, this fern was formerly used as an expectorant by the peasantry of Scotland. This is another of the many substitutes for the true Maiden-hair, now fallen into disrepute. Is the "Myle conday" of the Tamils.

ATHYRIUM FILIX-FEMINA, *Bernh.* The rhizome of this fern has been used as a substitute for that of the Male-fern, and the same virtues as an anthelmintic have been ascribed to it. It is now generally admitted, however, that these virtues were more supposititious than real, and it has ceased to be employed.

BALANTIUM CHRYSOTRICHUM, *Hassk.* Affords the "Pakoe kidang" of Java. The hairs are thicker, long and less soft and silky than those of the "Penawar Jambie" of Sumatra, but are similarly employed. Some of these fern products, consisting of shining brown hairs, have been imported into this country, but never came into use. See notice by Mr. Hanbury in PHARMACEUTICAL JOURNAL for November, 1856.

BLECHNUM BOREALE, *Sw.* "Hard Fern." The rhizome had formerly the reputation of being aperient and diuretic, but has long since ceased to be employed. Its virtues were doubtless imaginary.

BOTRYCHIUM CICUTARIUM, *Sw.* Is fancied by the inhabitants of St. Domingo to be an alexipharmic.

BOTRYCHIUM LUNARIA, *Sw.* "Moonwort." Magical properties have been assigned to this fern. Gerarde says, "It is singular to heale green and fresh wounds. It hath been used among the alchymists and witches to doe wonders withall, who say that it will loose lockes, and make them to fall from the feet of horses that grase where it doth grow, and hath been called of them 'Martagon,' whereas in truth they are all but drowsie dreams and illusions; but it is singular for wounds as aforesaid." Ray commends its virtues in dysentery.

(*To be continued.*)

THE SOURCE OF MUSCULAR POWER.

BY BARON LIEBIG.

The adherents of the doctrine that muscular power is generated by combustion of non-nitrogenous material in the muscles do not deny that the facts already stated have been established by experience, but they explain them in a different manner.

That doctrine is, in part, based upon some facts which Fick and Wislicenus have established by their investigation into the source of muscular force; they found that during the performance of measurable external work, viz. the lifting of their bodies to a certain height, the quantity of urea (or rather of nitrogen) secreted meanwhile and within five hours following, corresponded to a quantity of albumen which would have barely accounted for one-third of the work, supposing the albumen to have been burnt and the heat generated expressed in terms of work. The nitrogen in the fæces was not estimated. During the experiment only non-nitrogenous food was consumed.

The inference drawn from this observation was that the source of muscular power cannot be sought in the metamorphosis of muscular substance and its combustion; but that it must be generated by the transformation of non-nitrogenous constituents of food into oxygen compounds in the muscles.

The calculation made by Fick and Wislicenus seems to be based on the idea that the production of force in muscles is analogous to the case of a gun; it is conceivable that from the volume of the gas formed by combustion of the powder, the projectile force of the bullet might be calculated; or that, from the distance traversed by the bullet, the volume of the gas might be calculated. If the process of force-production were similar to the combustion of gunpowder, then, under the assumption that the force was generated by combustion of muscular substance and that urea was a product of the change, the quantity of urea would in fact be proportionate to the work done; always presupposing that force and urea were produced at the same moment. If in this case, the quantity of urea secreted did not correspond to the work done, it would follow that, if the work were determined by combustion, other and indeed non-nitrogenous materials had taken the place of muscular substance, and combined with oxygen.

However, it cannot be assumed that non-nitrogenous food can furnish any special condition for the production of force, since it may be regarded as certain that two powerful men could have reached the Faulhorn inn without greater exhaustion even if they had not taken any food and if they had drunk only water instead of wine. In regard to the inference itself, this has evidently no special importance; for if they had not eaten any non-nitrogenous food, it might have been assumed that the fat of their bodies had been consumed in the place of such food.

It does not appear to have been ascertained what the experimenters had lost in bodily weight after the experiment. Their conclusions would, of course, be correct only if the assumptions on which they are founded were true. But the case may have been very different.

It may be that the machine which we call organism possesses a much more perfect arrangement than is supposed according to the assumption of Fick and Wislicenus, perhaps one as perfect as a clock, which we are able to provide with force daily by winding it up, just as we provide the body with food every day, or which may be arranged so that in consequence of an accumulation of force, it will work for several days without any further supply of force. For maintaining the action of such a machine it is in both cases necessary, after the lapse of a certain time, to renew the supply of the force that has been expended in producing motion; but once fully wound up, no further supply is necessary within certain limits. Whatever force is expended, within a given time, over and above the supply, must, of course, be made up for after that time by an increased supply, if the original condition is to be restored.

Moreover, it may be that urea is not a product of the combustion of nitrogenous muscular material, and that its formation bears a relation to muscular work totally different from what Fick and Wislicenus have assumed.

From their memoir it is not quite clear how they regard the conversion of heat, generated by combustion of non-nitrogenous material in muscle, into mechanical effect as taking place. Frankland, who has adopted their view, expresses himself very definitely as follows:—

"The combustible food and oxygen coexist in the blood which courses through the muscle; but when the muscle is at rest, there is no chemical action between them. A command is sent from the brain to the muscle, the nervous agent determines oxidation. The potential energy becomes actual energy, one portion assuming the form of motion, another appearing as heat. *Here is the source of animal heat, here the origin of muscular power!* Like the piston and cylinder of a steam-engine, the muscle itself is only a machine for the transformation of heat into motion; both are subject to wear and tear, and require renewal; but neither contributes in any important degree, by its own oxidation, to the actual production of the mechanical power which it exerts."*

This passage represents the process of force production according to the view of Frankland and others who agree with him.

Here urea and uric acid are regarded as the products of the muscle used up.

If this view were correct, it would follow that the muscular machine is one of the most imperfect machines known, considering how large the daily waste in the shape of secreted urea would be. The fire-bars of a steam-engine furnace are not so rapidly used up.

Certainly the wonderful construction of the animal body and its parts will remain long, and perhaps for ever, an insoluble problem; but the processes taking place in its organs are of a physical or chemical nature, and it is unintelligible that oxygen and the combustible materials of the blood should require a command from the central organ in order to enter into combination. The share taken by the voluntary motor nerves in muscular activity must be of a totally different nature.

However, it appears to me unnecessary to submit the views of Frankland, Fick and Wislicenus to closer criticism; for I believe that, on the whole, those who have occupied themselves with the inquiry into the origin of muscular power have formed too easy an estimate of the problem, and that many years will elapse before it is possible to arrive at any definite conclusion as to what is really the nature of the question to be considered.

* *Phil. Mag.* 4th series, vol. xxxii. p. 194.

It is not my intention to enter into controversy, and I shall consider my object attained if the following remarks should contribute something towards throwing light upon the conditions that have to be ascertained in regard to this question.

Scientific men are tolerably clear in their views as to the mode in which oxygen operates in the animal body: oxygen combines with the elements of the food or of the body, carbonic acid, water and urea being regarded as the ultimate products of the combustion. In consequence of that combustion heat is produced, which warms the body and maintains its temperature, or becomes sensible in the form of mechanical effect.

If the heat of combustion proper to the various kinds of food be known, it would express for each, in some sort, its value as a source of power.

"From this point of view," says Frankland, "it is interesting to examine the various articles of food in common use, as to their capabilities for the production of muscular power," and by the determination of the heat of combustion proper to each, he arrives at the result that, for equal weights of food materials in the natural condition, Cheshire cheese represents three times as much force, expressed in food-pounds, as lean oxflesh; sugar two and a half times as much; and butter five times as much.

Here it is throughout assumed that muscular power is generated by the combustion of these materials in the muscles, and that the process of combustion is like that taking place under the boiler of a steam-engine. In this respect, we find two parts by weight of dry potatoes put down as equal to one and a half parts of dry flesh and to two parts of boiled ham (dry), etc. These are certainly most interesting results; in any case they are very unexpected results of the theory.

This is, perhaps, the place to call to mind that the combination of combustible elements of the animal body with oxygen is a process of a totally different nature from the ordinary process of combustion. Carbonic acid is never produced in the animal body by the combination of oxygen with carbon; it is not a product of combustion in the ordinary sense of that term.*

In order to comprehend correctly the difference between the process of combustion under a steam-boiler and that in the animal body, it is necessary to consider how the formation of organic compounds in plants takes place. These compounds are all formed out of carbonic acid; they represent carbonic acid atoms that have been more or less altered. In the animal body those compounds are again converted into carbonic acid, or into what they originally were.

In the formation of these compounds under the influence of sunlight, there is an absorption of heat or sun force. This becomes latent, and in the reconversion of those compounds into carbonic acid that heat is again liberated. This liberation of heat is at the maximum when the reconversion of the compounds into carbonic acid corresponds exactly to their formation.

For example, comparing carbonic acid with sugar in their most simple empirical formulæ, we have—

$\mathrm{C}^{\mathrm{O}}_{\mathrm{O}}$	$\mathrm{C}^{\mathrm{H}}_{\mathrm{O}}$
Carbonic acid.	Grape sugar.

A glance at both formulæ shows that sugar is, in fact, carbonic acid in which one equivalent of oxygen has been replaced by hydrogen. Carbonic acid is not decomposed in the formation of sugar, but it is only altered by the exchange of one of its constituents for something else.

In the conversion of sugar into carbonic acid, it is not the carbon of the sugar that is burnt, but the hydrogen that had been introduced by substitution into the carbonic acid. When this hydrogen combines with oxygen in the animal body and forms water, its place is again taken by oxygen which had been eliminated from the plant. Consequently, sugar can be burnt in two ways and converted into carbonic acid,—either directly, by combination with oxygen at a high temperature, or indirectly, by the replacement of its hydrogen by oxygen at a moderate temperature. The proportion of oxygen is, in both cases, the same,—sixteen parts by weight for every fifteen parts of sugar; but if there be inequality in the work of combustion, by which heat is expended, the heat liberated must also be unequal.

I will continue the exposition of this case, though without assigning any weight to the accuracy of it; my object is merely to show the difference which it is the business of the physicist to elucidate more completely.

If we suppose that, with the above-mentioned formula for grape-sugar, 6 grams of the carbon in 15 grams of sugar combine with oxygen directly, then there would be 6×7838 units of heat developed. But if we suppose that 1 gram of hydrogen were oxidized by 8 grams of oxygen, and that the 8 grams of oxygen introduced were to generate with the rest of the carbonic acid=14 grams carbonic oxide, just as much heat as in its combination with carbonic oxide, we should then have,—

In the first case	47,000 units of heat*	
,, other ,,	68,900 ,, ,,	
Therefore in the latter	21,900 ,, ,,	more.

It may be shown by undoubted facts that differences of this kind do really occur in the quantities of heat generated by combustion.

Frankland determined among other things the heat of combustion of cane-sugar, and found that 1 gram gave 3348 units of heat. Hence it follows that 171 grams of cane-sugar (1 atom) would give 572,508 units.

In fermentation there are produced from sugar carbonic acid and alcohol, and, if no other products were formed, 92 grams of alcohol should be obtained from 171 grams of sugar; in reality, only 88 or 89 grams are obtained,—let us say $88\frac{1}{2}$; the deficiency is succinic acid and glycerine, etc.

According to numerous determinations by exact observers,—Dulong, Despretz and Favre,—1 gram of alcohol yields as the mean 6981 units of heat, and $88\frac{1}{2}$ grams would give 617,818 units.

Consequently, alcohol itself gives, when burnt, 45,310 units of heat more than the corresponding quantity of sugar by the decomposition of which it has been formed. To this must be added the heat generated in the fermentation of sugar; according to the direct determination of Dubrunfaut, this amounts to one-eighth of the heat that would be generated by combustion of the carbon contained in

* See "The Chemical Process of Respiration," *Ann. Chem. Pharm.* lviii. 335.

	Heat units.
* By combustion of the hydrogen	34,533
By combination of 14 grams carbonic oxide with 8 grams oxygen	34,384
Total	68,917

the carbonic acid evolved in fermentation. Consequently,—

	Units of heat.
The alcohol from 171 grm. sugar gives	617,818
171 grams sugar give in fermentation	22,743
Total	640,561
According to Frankland's determination, however,—171 grams of sugar give	572,508
Or less by	68,053

Without taking into account the combustion of other products of fermentation, which would have given from 8000 to 10,000 units of heat, sugar gives nearly one-eighth more heat than Frankland's calculation indicates, when it is burnt otherwise than in the direct way; if we suppose alcohol to be oxidized at a low temperature, first to aldehyde, then to acetic acid, formic acid and lastly to carbonic acid, it is possible that other numerical results might be obtained for its heat of combustion.

In the determination of heat of combustion much depends on the work done in combustion; if part of the heat be expended in overcoming resistances, that part does not appear as sensible heat.

The simple difference of density in the diamond makes the form of carbon less combustible than charcoal, and it gives rise to a difference in the heat of combustion. The calorific power of diamond is less than that of charcoal by 285 units of heat.* This fact is accounted for by the assumption that the diamond in crystallizing has lost heat, which again becomes latent in combustion; moreover, since cohesion is a resistance to be overcome in the combination of carbon with oxygen, another portion of the heat generated is expended in overcoming that resistance, therefore less heat becomes sensible.

The determinations of the heat of combustion for various kinds of food materials by Frankland are certainly applicable for estimating the value those materials would have as fuel for generating steam; but I am of opinion that his numbers have no special significance as expressing the calorific power of food materials in the living body.

This is more especially the case in regard to the determinations of the heat of combustion of nitrogenous constituents of the body, or the albuminates in articles of food, and in regard to the inferences Frankland has drawn from those determinations as to the value of albuminates as a source of power.

These materials are not combustible in the ordinary sense of the term, neither are they burnt in the animal body any more than sugar as such is burnt; in regard to combustibility and their power of combining with oxygen, they are among organic substances analogous to gold and silver among inorganic substances.

As to their combustibility, the chemist knows well how difficult it is to burn organic substances that are rich in albuminates. Even at a red heat maintained for hours or days some portion of nitrogenous carbon remains unburnt. The same difficulty is experienced also with urea and uric acid salts.

Most nitrogen compounds that are not gaseous possess this peculiarity. There is certainly no more inflammable or more combustible substances than hydrogen and phosphorus, but their compounds with nitrogen are entirely uninflammable; for instance ammonia, though it contains half its volume more hydrogen than ordinary hydrogen gas does.

* Favre and Silbermann.

The non-inflammability of these substances obviously is due to the resistance offered by the nitrogen they contain to the action of oxygen. Taking heat also into account, it appears that according to the determinations of Favre and Silbermann, 1 gram of hydrogen in combining with nitrogen to form ammonia developes 7576 units of heat, or nearly as much as is developed in the combustion of 1 gram of carbon to carbonic acid. It must probably be assumed that in the combustion of 5·66 grams of ammonia, containing 1 gram of hydrogen, an equal quantity of heat would be expended in the work of combustion. Perhaps this may be regarded as a reason why ammonia burns with so much difficulty; but it is not the only reason. Very much appears to depend on external conditions; if they facilitate the oxidation of nitrogen, as is the case in mixtures of decaying materials with alkaline bases, then the hydrogen of ammonia burns with great readiness.

In cyanogen and paracyanogen we have two compounds of nitrogen and carbon identical in composition, but presenting a remarkable difference in regard to combustibility, cyanogen being readily combustible, while paracyanogen burns with great difficulty.

Observation shows that 1 gram of carbon in cyanogen developes by combustion 43 per cent. more heat* than 1 gram of carbon does when burnt by itself.

Evidently, therefore, this surplus heat must be rendered latent in the formation of cyanogen, and in fact in the conversion of cyanide of silver into the paracyanide so much heat is developed that the mass becomes red-hot. If the combustibility of cyanogen be due to the latent heat it contains, still that does not explain why the carbon in paracyanogen appears to have lost its affinity for oxygen to such a great extent.

This consideration of the behaviour of some nitrogenous substances may suffice to show that it is not admissible to estimate their efficacy as sources of power according to the amount of heat they may develope by direct combustion.

We may suppose the possibility of maintaining a machine in a state of work by bringing the vapour of chloride of nitrogen in contact with phosphorus in a vessel, and yet it would be next to impossible to determine the work done directly in heat units, for neither chlorine nor nitrogen are combustible substances in the ordinary sense of the term.

Chloride of nitrogen is formed by the action of chlorine on ammonia; if there be excess of ammonia no chloride of nitrogen is formed, but the chlorine then decomposes the ammonia *with considerable evolution of heat.* In the absence of free ammonia chloride of nitrogen is formed *without any rise of temperature.* It is evident, then, that all the heat developed in the former case is in the latter case rendered latent in the chloride of nitrogen; however, in the decomposition of this substance the latent heat does not reappear as heat, but as motive force.

There are many cases in which mechanical or motive effects are produced by some internal or molecular motion. The magnitude of the effect in these cases depends upon the tension in which the parts exist in regard to one another.

* 11,260 heat units.

The behaviour of glass tears affords a good example of such internal tension; if they are scratched at any part of the surface so as to disturb the equilibrium of the parts, the tears fly to powder with great force. In this case there is no alteration in the composition of the glass; the state of tension obtained only in regard to the homogeneous particles of glass, not in regard to its constituents. In the case of fulminating silver or of nitroglycerin, this tension obtains especially in regard to the dissimilar particles or the constituents of the substances.

Nitroglycerin, or fulminating silver, may be heated above 100° C. without undergoing decomposition, while the breaking of a small crystal of fulminating silver, or a slight blow upon nitroglycerin, at once causes the constituents of those substances to assume a state of stabile equilibrium with violent explosion.

If nitroglycerin is dropped upon a red-hot iron it burns completely with a slight hissing, but without any explosion.

In the one case an enormous motive force is developed by the blow, while in the other case heat is generated by combustion. The motive force is the result of an internal molecular motion; the heat is a consequence of perfect combustion of the constituents of nitroglycerin.

These examples are evidently quite inappropriate for elucidating the exercise of muscular force in the animal body, which takes place in a totally different manner; they are intended merely to show that by the alteration of internal arrangement of the constituents of certain compounds great mechanical effects may be produced without any action of oxygen from without.

The albuminates of the plant world are the most complex nitrogen compounds that we know. All the constituents of the animal body are produced from the albumen of the body by an altered internal arrangement of the parts of albumen, or by their separation. In these changes oxygen exercises a determining influence without being the cause of them; and it may be assumed that if these products of albumen be sources of power, the motion they produce depends upon the tension accumulated in them during their formation and liberated in their decomposition, not upon their combustion or upon the conversion of heat into motive force.

It is quite certain that the substance of the membranes and those constituents of bone which furnish gelatin, that blood fibrin, the nitrogenous constituents of brain, the acids of bile, hippuric acid and wine acid, are products of the transformation and breaking up of albumen; but we have no evidence that albumen yields urea, carbonic acid and water as the result of combustion.

All attempts to produce urea from albuminates by oxidation have failed as completely as the attempt to produce alcohol from sugar by chemical means; and probably the conversion of uric acid into urea and carbonic acid may afford a good example of the processes and changes which the albuminates undergo in the animal body.

Uric acid, like albumen, is one of the most difficult substances to burn directly; it is not broken up by concentrated sulphuric acid, or by boiling with hydrochloric acid or potash; but there is probably no other substance of which the constituents are so readily moveable under the simultaneous influence of oxygen and acids or alkalies, none that is susceptible of conversion into such a multitude of products as uric acid is.

By addition of two equivalents of oxgyen in the presence of an acid, uric acid breaks up into urea and alloxan; by further addition of oxygen, alloxan breaks up into urea and carbonic acid. In the presence of a strong base and oxygen, uric acid breaks up into oxalic acid, allantoin and urea; by a further addition of oxygen allantoin breaks up into urea and allanturic acid, this latter substance containing the elements of carbonic acid and urea.

In all these cases urea is produced from uric acid by addition of oxygen; but it is not, in any case, a product of direct oxidation; it is produced by the breaking up of a newly formed and more highly oxidized compound.

(To be continued.)

WHAT IS ENERGY?*

BY BALFOUR STEWART.

It is only of late years that the laws of motion have been fully comprehended. No doubt it has been known since the time of Newton that there can be no action without reaction; or, in other words, if we define momentum to be the product of the mass of a moving body into its velocity of motion, then whenever this is generated in one direction an equal amount is simultaneously generated in the opposite direction, and whenever it is destroyed in one direction an equal amount is simultaneously destroyed in the opposite direction. Thus the recoil of a gun is the appropriate reaction to the forward motion of the bullet, and the ascent of a rocket to the downrush of heated gas from its orifice; and in other cases where the action of the principle is not so apparent, its truth has notwithstanding been universally admitted.

It has, for instance, been perfectly well understood for the last 200 years that if a rock be detached from the top of a precipice 144 feet high it will reach the earth with the velocity of 96 feet in a second, while the earth will in return move up to meet it, if not with the same velocity yet with the same momentum. But inasmuch as the mass of the earth is very great compared with that of the rock, so the velocity of the former must be very small compared with that of the latter, in order that the momentum or product of mass into velocity may be the same for both. In fact, in this case, the velocity of the earth is quite insensible and may be disregarded.

The old conception of the laws of motion was thus sufficient to represent what takes place when the rock is in the act of traversing the air to meet the earth; but, on the other hand, the true physical concomitants of the crash which takes place when the two bodies have come together were entirely ignored. They met, their momentum was cancelled; that was enough for the old hypothesis.

So, when a hammer descends upon an anvil, it was considered enough to believe that the blow was stopped by the anvil; or when a break was applied to a carriage-wheel it was enough to imagine that

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* Reprinted from *Nature*. This is the first of a series of papers on a subject that is daily becoming more important in its general scientific bearing, while it is treated in so clear and instructive a way that the papers cannot fail to be useful to all who read them carefully.—ED. PH. J.

the momentum of the carriage was stopped by friction. We shall presently allude to the names of those distinguished men who have come prominently forward as the champions of a juster conception of things, but in the meantime let us consider some of those influences which served to prepare men's minds for the reception of a truer hypothesis.

We live in a world of work, of work from which we cannot possibly escape; and those of us who do not require to work in order to eat, must yet in some sense perform work in order to live. Gradually, and by very slow steps, the true nature of work came to be understood. It was seen, for instance, that it involved a much less expenditure of energy for a man to carry a pound weight along a level road than to carry it an equal distance up to the top of a mountain.

It is not improbable that considerations of this kind may have led the way to a numerical estimate of work.

Thus, if we raise a pound weight one foot high against the force of gravity we may call it one unit of work, in which case two pounds raised one foot high or one pound raised two feet high would represent two units, and so on. We have therefore only to multiply the number of pounds by the vertical height in feet to which they are raised, and the product will represent the work done against gravity. The force of gravity, being very nearly constant at the earth's surface and always in action, is a very convenient force for this purpose; but any other force, such as that of a spring, would do equally well to measure work by. Generalizing, we may say, *the space moved over against a force multiplied into the intensity of that force will represent the quantity of work done.* So much for the definition of work, and it is necessary to know what *work* is before proceeding to define *Energy.*

Now what does the word Energy really mean? In the first place it does not mean force.

Two substances may have an intense mutual attraction, in virtue of which they form a very intimate union with one another; but when once this union has been consummated, although the force still continues to exist, the combination is singularly deficient in Energy. Nor does Energy mean motion, for although we cannot have motion without Energy, yet we may have Energy without motion.

By the word Energy is meant the power of doing work; and the energy which a labouring man possesses means, in the strictly physical sense, the number of units of work which he is capable of accomplishing.

This is a subject which at this stage we may attempt to illustrate by reference to a very different department of knowledge.*

The analogy which we shall venture to institute is between the social and the physical world, in the hope that those who are more familiar with the former than with the latter may be led to perceive clearly what is meant by the word Energy in a strictly physical sense. Energy in the social world is well understood. When a man pursues his course, undaunted by opposition and unappalled by obstacles, he is said to be a very energetic man.

By his energy is meant the power which he possesses of overcoming obstacles; and the amount of this energy is measured (in the loose way in which we measure such things) by the amount of obstacles which he can overcome—the amount of work which he can do. Such a man may in truth be regarded as a social cannon-ball. By means of his energy of character he will scatter the ranks of his opponents and demolish their ramparts. Nevertheless, a man of this kind will sometimes be defeated by an opponent who does not possess a tithe of his personal energy. Now, why is this? A reply to this question will, if we do not mistake, exhibit in a striking manner the likeness that exists between the social and the physical world. The reason is that, although his opponent may be deficient in personal energy, yet he may possess more than an equivalent in the high position which he occupies, and it is simply this position that enables him to combat successfully with a man of much greater personal energy than himself. If two men throw stones at one another, one of whom stands at the top of a house and the other at the bottom, the man at the top of the house has evidently the advantage.

So, in like manner, if two men of equal personal energy contend together, the one who has the highest social position has the best chance of succeeding. For this high position means Energy under another form. It means that at some remote period a vast amount of personal energy was expended in raising the family into this high position. The founder of the family had, doubtless, greater Energy than most of his fellows, and spent it in raising himself and his family into a position of advantage. The personal element may have long since disappeared from the family, but not before it had been transmuted into something else, in virtue of which the present representative is able to accomplish a great deal, owing solely to the high position which he has acquired through the efforts of another. We thus see that in the social world we have what may justly be termed two kinds of Energy, namely:—

1. Actual or personal Energy.
2. Energy derived from position.

Let us now again turn to the physical world. In this, as in the social world, it is difficult to ascend. The force of gravity may be compared to that force which keeps a man down in the world. If a stone be shot upwards with great velocity, it may be said to have in it a great deal of actual Energy, because it has the power of doing useful work or of overcoming up to a great height the obstacle interposed by gravity to its ascent, just as a man of great energy has the power of overcoming obstacles. But this stone as it continues to mount upwards will do so with a gradually decreasing velocity, until at the summit of its flight all the actual Energy with which it started will have been spent in raising it against the force of gravity to this elevated position. It is now moving with no velocity—just, in fact, beginning to turn—and we may suppose it to be caught and lodged upon the top of a house. Here, then, it remains at rest, without the slightest tendency to motion of any kind, and we are led to ask what has become of the Energy with which it began its flight? Has this Energy disappeared from the universe without leaving behind it any equivalent? Is it lost for ever, and utterly wasted? But the answer to this question must be reserved for another article.

(*To be continued.*)

* The subject has previously been discussed from this point of view by Messrs. Stewart and Lockyer, in an article in *Macmillan's Magazine*, August, 1868.

M'BOUNDOU OR ICAJA, AN ORDEAL POISON USED AT THE GABOON.

BY MM. RABUTEAU AND PEYRE.

In 1869, one of the authors brought from the Gaboon some roots of M'boundou. They had been dug up by himself from a humid soil in the vicinity of the river Como, about thirty leagues inland. It is only with great difficulty that the plant is to be obtained in the settlement. The places where it is to be found are kept secret with such care by the fetishmen from Europeans, and even from the natives, that up to the present time only a few specimens have been obtained, which have not been sufficient to enable a complete study of its toxic properties to be made.

The roots with which the experiments were made measured at the crown the largest three centimetres in diameter, the smallest about one. They are sometimes found of a larger size. The length varied between fifty and seventy centimetres. The rather thick bark is, both when fresh and when dry, reddish at the surface and of a bright red colour under the epiderm. The wood which it covers is greyish-white and very hard.

The experiments were nearly all made with the bark, —some few, however, with the root-wood,—from which aqueous and alcoholic extracts were prepared. The bark and the wood are both very bitter, their infusions, even when very much diluted, possessing still an extreme bitterness. Treated with a solution of iodine and iodide of potassium, or with phosphomolybdic acid, they gave an abundant precipitate. They contain an alkaloid (perhaps many) which is believed to be the same in the bark and in the wood, since the effects observed upon animals have appeared identical, the only difference noted being that the alcoholic extract has seemed more active than the aqueous extract. A difference, though but a slight one, has been noticed in the effect of the poison when introduced into the stomach from that which follows it when introduced under the skin of animals.

After many experiments made with varied doses of the poison upon frogs, rabbits and dogs, it is believed that the following is the manner of action of the poisonous principle of m'boundou.

Introduced in a very small quantity under the skin of a frog the poison produces only a constraint of the movements,—a sort of paralysis,—which prevents it from jumping except with difficulty. The same effect was observed when, instead of introducing the extract, which is very powerful, under the skin, a little powdered root has been substituted for it. When only a small quantity of the aqueous extract has been introduced under the skin, its effect disappears completely after about an hour.

A dose of three milligrammes of this extract injected under the skin of a frog produces at first the constraint of movements just noticed, but after ten minutes or more it suffers from shocks and tetanic convulsions. These convulsions are not produced spontaneously in general, but are brought on by touching the animal, or simply striking the table upon which it rests. If the dose is stronger—one centigramme, for example—the convulsions appear more quickly; there is rigidity, but it is rarely that the animal can be raised altogether as when one is poisoned by strychnine. There is always a certain relaxation compared with what is observed in the action of strychnine. Moreover, the frog is not rigid after death. This occurs after a period not exceeding three-quarters of an hour, unless the dose has been feeble; in that case the animal, placed in water, recovers completely after a few hours.

If a frog be prepared according to the method of M. Claude Bernard, by tying the lower part of the trunk and excluding the lumbar nerves, then, by introducing the extract under the skin, it is ascertained that m'boundou acts upon the spinal marrow. It is not a muscular poison.

A dose of ten centigrammes of the extract of m'boundou in aqueous solution injected under the skin of a rabbit in two or three different places, in order that the absorption should be more rapid, killed the animal in twenty minutes. Five or ten minutes after the injection, upon being touched, it suffered from energetic starts and shocks that may be compared to electric shocks; at the same time the movements of its limbs, especially of its posterior ones, were much impeded. It died from asphyxia, but its life might have been prolonged by artificial respiration. The same dose injected in another rabbit at a single point did not cause death; at the end of two hours the animal had but feeble shocks upon being touched, and even these disappeared totally. It ate with appetite. This fact proves evidently that the elimination of the poison is rapid.

Fifteen centigrammes of the same extract dissolved in thirty or forty grammes of water, and introduced into the stomach of a rabbit, caused its death at the end of an hour and five minutes. The symptoms, which were the same as the preceding, commenced to manifest themselves ten minutes after the introduction of the poison. With a dose of forty centigrammes the effects were startlingly sudden.

The symptoms observed in dogs were of the same kind, appearing generally, according to the dose, at the end of five or ten minutes. When their appearance was tardy they were easily provoked, as in the case of the rabbits, by raising the animal or simply touching it. As before, the shocks were powerful, the breath was panting, the posterior limbs were paralysed. The uncertainty and difficulty of the movements were more apparent when the aqueous solution of the extract was introduced into the stomach than when it was injected under the skin. A dog which had been made to swallow twenty-five centigrammes of extract dissolved in forty grammes of water called to mind the bar that the Gaboonese wish those who have taken the ordeal beverage to jump over. This animal, sensible to caresses and obeying the voice, could not clear steps eighteen centimetres high. Every time that it made an effort it trembled, and suffered violent tetanic convulsions. At the end of an hour it was still convulsed, even under the influence of fear; but an hour later, that is, two hours after the injection of the poison, there only remained a slight stiffness in its movements, and it ate with good appetite. Its ears and muzzle, which had been hot before, became cool.

A dose of forty centigrammes of extract introduced into the stomach of a dog caused death in twenty minutes. It died of asphyxia, accompanied by convulsions; its sphincters relaxed, causing an emission of urine and fecal matter. A nasal hæmorrhage was observed, which hæmorrhage has also been noticed among the Gaboonese. Rigidity did not set in until about three-quarters of an hour afterwards.

Upon considering these facts, it appears that the active principle or principles of m'boundou produce effects which present a certain analogy with those produced by strychnine, but differ considerably from them under certain aspects. These effects resemble rather those of brucine; but it is remarked that m'boundou did not produce that hoarseness of voice in the dog experimented upon which, contrary to what is generally admitted, the authors have remarked in dogs to whom brucine has been given by them.

M'boundou is an extremely rapid poison, but the experiments tend to show that it is quickly eliminated from the system, and that fatal symptoms may be allayed by artificial respiration.

Some researches upon m'boundou were made in 1861 by MM. Pécholier and Saintpierre.* These experimenters had but a small quantity of root at their disposal; they nevertheless observed the greater part of the symp-

* *Journal d'Anatomie et de Physiologie.*

toms above noted. But the authors cannot agree with them that the poison, after having produced tetanic convulsions, leads to insensibility, paralysis and death. The restraint of the movements was noticed by them first, death occurring in the midst of convulsions.—*Comptes Rendus.*

REPORT OF THE WARDEN OF THE STANDARDS.

In his report for the year ending March 31, 1870, Mr. Chisholm, the Warden of the Standards, gives in a tabular form the number of verifications and reverifications of Local Standards by the Department each year from the 31st March, 1859, to the 31st March, 1870, inclusive. During the last twelve months these have amounted to 1614, being a decrease compared with the previous year of no less than 1067. This is partly accounted for by the change in the law, which now allows remaining county sets of standards to be reverified locally with a set which has been duly reverified in the Standards Department. The number of standards rejected last year as requiring readjustment was 173, or 11 per cent., the proportion in the previous year having been 13 per cent. There were at the date of the report 114 places in the United Kingdom without legal standard weights, and 85 without legal standard measures, in consequence of the requirement of the law that standard weights should be reverified every five, and measures every ten years, not having been complied with. These were cases known to the department, but it is probable that there were others that had escaped official notice. For instance, a set of standard weights and measures from the borough of Lostwithiel, has been recently delivered at the Standards Office for reverification, bearing the date of 1741, and the Exchequer stamp of verification of the reign of George II., which had been in use in the borough up to that time. They appeared to be in good condition considering their age. The weights were deficient; the lb. weight (avoirdupois) wanting 6·5 grains; the measures of capacity were mostly in excess, the half-bushel to the extent of 1¼ gill. The books of the department, which commenced in 1824, contain no record of the verification of any standards for Lostwithiel.

During the past year the reverification of all the official standards has been completed by the most accurate comparisons of the standard measures of capacity, and the gas-measuring standards. In no single instance has any material error been found that could affect injuriously the accuracy of the copies verified for the use of local inspectors.

A set of standard avoirdupois weights is now being constructed of glass by Mr. Oertling and Messrs. Chance, of Birmingham, with a view of ascertaining how far, having regard to the cost, durability and invariability of such weights, the surface of glass not being liable to oxidation, it may be desirable that it should be used as the material for local standard weights.

In pursuance of the recommendations of the Standards Commission, new standard measures of one-sixth and one-twelfth of a gallon, as measure of the wine bottle and half wine bottle, have been constructed and are now being verified. A complete set of new standard imperial measures of capacity, from the quart downwards, including also a series of measures of decimal grain-weights of distilled water at the temperature of 62° F., have been constructed by Messrs. Griffin. These measures are in the form of glass burettes, each of which is fitted with a brass collar and screw at the upper part, so that, being attached to an apparatus made for the purpose, it may be filled with water up to a defining line on the narrow tube of the burette and made to deliver the exact measure.

A complete set of copies of the official imperial standards is now being constructed for presentation to the French Government. When completed and verified, they will be deposited with the collection of standards at the Conservatoire Impérial des Arts et Métiers at Paris.

Increased accommodation has been given to the department by the addition of several fresh rooms to the office, which now includes all the three floors of the old Norman Jewel Tower. From the great thickness of the stone walls of the tower, the rooms in this building are favourable for standard operations, being very free from vibration, and not liable to sudden fluctuations of temperature. The large room in the basement, which has a beautifully groined vaulted roof, is fitted up as a weighing room, with all the finest balances. The adjacent room is fitted for containing all the glass fluid measures and for making comparisons with them. The large room on the first floor is intended to be exclusively used for containing the standard measures of length, the new microscopical comparing apparatus and the vertical comparateur, and for operations with them. The new rooms on the upper floor are to contain the large collection of older standards of an antiquarian or historical character. The old roof of these upper rooms, with its large beams of chestnut wood, has been completely restored, the whole of the interior of the building being made to correspond as nearly as possible with its appearance when originally completed in the reign of Richard II.

Invitations have been issued by the French Government to the English and other Governments to send delegates to take part in the International Standards Commission, with the view that every country in which the metric system has been adopted, or its adoption contemplated, may be furnished with uniform primary copies of the metric standards at Paris of the highest possible accuracy. Twenty-one countries have accepted the invitation, the number of delegates amounting to thirty-five, to whom will be joined ten more appointed by the French Government. The three delegates appointed on behalf of England are the Astronomer Royal, Professor W. H. Miller, F.R.S., and the Warden of the Standards.

The Coinage Act of last session has imposed fresh duties on the Standards Department; new standard weights of the gold, silver and bronze coins, sixteen in number (ranging from the five-pound and the two-pound gold piece down to the farthing, and including silver twopences and pennies), are now being constructed under the provisions of the Act. As soon as these standard coin weights shall have been duly verified and made legal standards by an Order in Council, regulations will be issued under which any copies of the standard coin weights may be verified and marked or stamped in the department; and no weights other than those so marked or stamped are to be deemed just weights for determining the weight of gold and silver coins of the realm.

ANCIENT USE OF ODORIFEROUS PLANTS.

In his introductory address to the Medical Section of the British Medical Association at their late meeting at Newcastle-upon-Tyne, Dr. Rumsey, referring to a remarkable series of observations which Professor Mantegazza has reported to the Institute of Lombardy, made the following remarks:—

"The experiments were not made under the dull sky of Britain, but in sunny Italy. We have all heard how Acron of Agrigentum, and other followers of Empedocles the physicist, employed aromatic and balsamic herbs as preventives of pestilence, often burning them, sometimes planting them round their cities. So also Herodian records (*Langius Jo.*, *Florilegium*, Morbus, p. 1854; Lugduni, 1648) that, in a plague which devastated Italy in the second century—the counsel of the doctors having been taken—strangers crowding into Rome were directed to retreat to Laurentum, now San Lorenzo, that by a cooler atmosphere, *and by the odour of laurel*, they might escape the danger of infection. Some of us may have smiled at the latter part of the advice. Could the scent of herbs and flowers do more than conceal the presence of infectious matter in the air? Mantegazza now replies in the affirmative. He says that in the oxidation of the essences of odoriferous plants a large quantity of ozone is evolved, at least as much as is produced by phosphorus or electricity; also that, in the greater number of these cases, ozone is developed only by the direct rays of the sun, although in others the action, commencing in solar light, is found to continue in darkness. Some details of these interesting experiments have appeared in the scientific periodicals, so I need only mention that among the plants which largely develope ozone on exposure to the rays of the sun, are cherry-laurel, clove and lavender; among flowers, the narcissus, hyacinth and mignonette; and among perfumes, similarly exposed, eau de Cologne, oil of bergamot and some aromatic tinctures. Flowers destitute of perfume are said *not* to produce ozone. The professor, therefore, recommends the cultivation of herbs and odorous flowers *in marshy districts and in places infected with animal emanations.*

"The destruction of the demon Malaria, by a spirit begotten by sunlight out of flowers—if it be confirmed by subsequent observation—not only explains the good effects of what might seem to have been merely speculative or empirical advice, but also affords a beautiful confirmation of an ancient myth by modern science. When Apollo the Healer, by his life-inspiring and health-restoring rays, penetrates the loveliest objects in creation, and draws forth from them a mysterious purifier, a mighty but invisible disinfectant,—the god of Medicine may be said to administer to a plague-stricken people a most potent remedy concealed in the most grateful and attractive forms."

CARDED OAKUM.

The *Lancet*, speaking of the use of carded oakum as a surgical dressing in war, says so many advantages are possessed by it "that we expect it to be largely employed in the military hospitals of France and Germany during the present war. As, however, its qualities are not yet so widely known as they should be, it may be useful at the present juncture to refer to them. The material is simply old rope shredded in prisons and workhouses, and carded by machinery. It is of a bright brown colour, with the well-known tarry fragrance. A little of the oakum is roughly drawn into a suitable shape for covering the wound, then wetted, and applied to it. All discharge is absorbed by the dressing, and any bad odour is effectually destroyed. By dipping it into hot water, and covering it with oil-silk, a convenient antiseptic poultice is formed, easily made, very light and answering perfectly its purpose. It thus supersedes the use of lint, ointments and linseed-meal or bread-poultices. It is easily burnt—no small advantage in a crowded hospital, where bad-smelling applications are a fertile source of disease if not quickly destroyed. Its simplicity of application saves much time and labour—a great consideration where the nursing staff is overtaxed, as must always happen after serious engagements. Its cheapness is another great advantage. Carded oakum can be procured, we believe, for something like 9*d.* per pound, about a fifth or sixth of the cost of lint. In America, during the civil war, carded oakum was largely employed. It has also been in use for some years at the Children's Hospital in Great Ormond Street, and at St. George's during the last twelvemonth its use has superseded other dressings in the hands of several members of the surgical staff."

Mr. T. Westhorpe, of the Falcon Works, West India Road, who manufactures the machine-picked oakum, in a letter to the *Times*, points out that the *Lancet* is wrong in asserting that "the material is simply old rope shredded in prisons and workhouses and carded by machinery." He says, "I beg to say that the material supplied by me, and now used for some time past in the Children's Hospital, St. George's Hospital, the London Hospital and other hospitals, and known as 'marine lint for surgical purposes,' has not a particle of old rope in it. A most careful examination of the marine lint, and also of oakum picked at prisons and workhouses, has been made at my manufactory this day by one of the principal surgeons of our large hospitals. Having inspected various bales taken from some ten tons of the latter, I think I may fairly state his opinion to be that the impurities contained in workhouse and prison-picked oakum, and not to be got rid of by carding, render it anything but a desirable application to wounds. Doubtless in a few days we shall have a report from those who are using the marine lint on the battle-fields."

NEW TEST SOLUTION FOR SUGAR.

J. Loewe recommends the use of glycerin in place of tartaric acid for the preparation of an alkaline copper solution for the detection of sugar. Glycerin entirely prevents the precipitation of oxide of copper, and the solution prepared with it has the advantage of being less liable to alteration when kept than the tartaric solution is.

To prepare a test liquid of this kind 16 grams of sulphate of copper should be dissolved in 64 parts of water; to this solution is gradually added 80 c.c. of soda solution (1·34 sp. gr.), then 6 or 8 grams of glycerin, which redissolves the hydrated oxide of copper that had been precipitated.

This liquid should not become turbid when diluted with two-thirds of bulk of water nor when boiled.

The copper solution may also be prepared by dissolving hydrated oxide of copper in a mixture of glycerin and caustic soda. The hydrated oxide is best obtained by adding soda solution to an ammoniacal solution of sulphate of copper, washing the precipitate and drying over oil of vitriol.

For 6 grams of this hydrated oxide there should be 6 or 8 grams of glycerin, 50 grams of water and 56 grams of soda solution of the strength above mentioned. This mixture is then diluted as may be requisite. The author prefers this solution to the other. It does not become turbid with alcohol.

The solutions will not bear considerable dilution without depositing hydrated oxide of copper, but this may be prevented by increasing the proportion of glycerin or of soda.—*Zeitschrift für analytische Chemie.*

NEW SOURCE OF CITRIC ACID.

Professor O. Silvester, of the Catanian University, has recently discovered that the fruit of *Cyphomandra betacea* contains a large quantity of citric acid.

The plant belongs to the *Solanaceæ*, and it occurs here and there in gardens throughout Sicily. It is a native of Mexico, is frequent in Peru and other parts of South America, where it is called *Tomate de la Paz.* The fruit contains from 1 to 1·5 per cent. of pure citric acid.—*Cosmos.*

Modification of Bones by Earths in the Food.—M. Papillon has recently communicated to the Academy of Sciences in Paris some interesting results of experiments in which pigeons and rats had various earthy salts mixed with their food. After continuing this for several months the animals showed no sign of being affected. On examination of their bones it was found that considerable quantities of strontia and alumina had been accumulated in them according as their food had been mixed with a salt of strontia or alumina.

DECIMAL GRAIN-WEIGHT.

(From the *London Gazette* of Friday, August 12.)

Whereas the Lords of the Committee of Privy Council for Trade have represented to her Majesty that the following decimal series of new avoirdupois grain-weights have been recommended by the Commissioners appointed by royal warrant, bearing date the 4th day of May, 1868, for inquiry into the condition of the Exchequer Standards (now called the Board of Trade Standards) of length and weight, and for other purposes, to be legalized as secondary standards, in pursuance of sections six and eight of the "Standards of Weights, Measures, and Coinage Act, 1866," and that such grain-weights have been constructed, and have been duly verified in the Standards Department of the Board of Trade, their weight in relation to the imperial standard pound having been accurately determined:—

Decimal Grain-Weights.

4000, 2000, 1000 grains.	5, 3, 2, 1 grains.
500, 300, 200, 100 "	0·5, 0·3, 0·2, 0·1 "
50, 30, 20, 10 "	0·05, 0·03, 0·02, 0·01 "

Now, therefore, in pursuance of, and by virtue of the said recited Act of Parliament, her Majesty, by and with the advice of her Privy Council, is pleased to order, and it is hereby declared, that the said decimal avoirdupois grain-weights shall be legal secondary standards of Imperial weight, from and after the time when this order shall have been duly published in the *London Gazette*, pursuant to the said Act.

ARTHUR HELPS.

AMENDMENT OF THE MEDICAL ACT.

The following letter, which sufficiently explains itself, appeared in the *Times* of the 1st of September:—

Sir,—With reference to a recent report in your columns, we beg to state that at the late meeting of the British Medical Association, held at Newcastle-upon-Tyne, we found ourselves compelled to resign our seats on the council of that body.

As members of the General Council of Medical Education and Registration, we had advocated the main provisions of the Amended Medical Bill introduced into the House of Lords by the Lord President of the Privy Council—provisions which, in our judgment, were of the utmost importance to the public weal.

The Bill, it is believed, was withdrawn in the House of Commons by Mr. Forster in consequence of the course pursued by the Direct Representation Committee of the Association. That course was subsequently approved by a vote of the Association at Newcastle.

We, therefore, could not, in justice to ourselves or to the members of the Association, continue any longer to belong to its executive.

The question of the permanent construction of a Medical Council of Education is one of grave importance. It is intimately connected with other questions and interests entirely extra-professional, and it cannot, therefore, be properly dealt with by any hasty or one-sided legislation.

We are, Sir, your obedient servants,
GEORGE PAGET, Cambridge.
WILLIAM STOKES, Dublin.
HENRY W. ACLAND, Oxford.
H. WILDBORE RUMSEY, Cheltenham.
DENNIS EMBLETON, Newcastle-on-Tyne.

A Good Hair Oil.—The *Journal of Applied Chemistry* recommends the following:—Pure fresh castor oil, 2 oz.; Cologne spirit (95 per cent.), 16 oz. The oil is freely dissolved in the spirit, and the solution is clear and beautiful. A very cheap and good dressing is made by dissolving four ounces of pure, dense glycerine in twelve ounces of rose water.

Coloured Rain and Snow.—On the 14th of February a remarkable yellow rain fell at Genoa. The following details respecting it are given in a letter addressed to M. Ad. Quetelet by M. G. Boccardo, Director of the Technical Institute of Genoa, who examined it in concert with Dr. Castellani, professor of chemistry. The quantitative analysis gave the following results:—

Water	6·490	per cent.
Nitrogenous organic substances	6·611	"
Sand and clay	65·618	"
Oxide of iron	14·692	"
Carbonate of lime	8·589	"

Examination under the microscope revealed the presence of a number of spherical or irregular ovoid substances of a cobalt blue colour; corpuscles similar to the spores of *Peziza* or *Permospora;* spores of *Dematiaceæ* or *Spheriaceæ;* a fragment of a *Torulacea (?)*; corpuscles of a pearly colour, concentrically zoned, probably small grains of fecula; gonidia of lichens; very scarce fragments of *Diatomaceæ;* spores of an olive-brown colour; a few fragments of filaments of *Oscillaria*, *Ulothrix*, and *Melosira varians;* a fragment of *Synedra;* a peltate hair from an olive leaf. If, instead of collecting the earth on the morning of the 11th, when it had already been subjected to the action of rain falling for several hours, I had been able (writes M. Boccardo) to observe the phenomenon during the night, at the moment when it was produced, it is very probable that the microscope would have shown the existence of several kinds of infusoria, as has been the case in several similar instances.

The author notes that the direction of the wind at Genoa during the night of the 13th and 14th was from the south-east, and, without being exactly a hurricane, as on the preceding few days, was still very strong. The temperature, previously exceptionally low, had risen, and probably did not fall during the night below + 4° R. (5° C. or 41° F.). The journals state that on that date a tempest devastated the coasts of Sicily. M. Boccardo, following P. Denza, proposes the theory that the dust came from the coast of Africa. "We ought not to forget," he writes, "that, according to Maury's theory of the circulation of the atmosphere, these clouds of dust may have travelled a long distance before touching the soil of Italy, coming from beyond the Atlantic, like those which, in 1846, spread from Guiana to the Azores, over the south of France and the whole of Italy."

In a paper in the *Bulletins de la Société Vaudoise*, No. 62, Dr. C. Nicati gives a *résumé* of various researches respecting the peculiar red snow which occasionally falls in the Grisons. Some of this snow fell, mingled with common snow and rain, during a violent storm from the south-west, on the morning of January 15th, 1867, in various places. The chemical analysis of the melted snow demonstrated the presence of minute quantities of sulphate of lime or gypsum, sulphate of magnesia, organic matters, chlorine, and iron; and microscopic examination detected vegetable fibre, pollen, spores, with here and there diatoms and small crystals. The colour varies from brick-red to a pale yellow. This snow is quite distinct from the red snow of the upper alpine regions, which owes its colour to the presence of the minute plant, *Protococcus nivalis.* After discussing various theories respecting its origin, Dr. Killias expressed his opinion that it is the dust of the desert of Sahara, transported by a sirocco, which gives the colour to the snow of the Grisons. Dr. Nicati gives many interesting particulars, with analyses, of the Algerian sirocco dust, and of the mud-rain in Naples and Sicily; and Professor C. Cramer states that he has discovered, both in the sand of the Sahara and in the red snow of the Grisons, particles of vegetable organisms (especially polythalamia) and minute fragments of animal origin, such as wool, hair, etc. He considers the presence of gypsum in the red snow an incontestable proof of its containing matter conveyed from the desert of Sahara.—*Nature.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 3, 1870.

MR. SIMON ON THE PRACTICE OF PHARMACY IN GREAT BRITAIN.

In addition to the details of the working of the Pharmacy Act to which we last week referred, the medical officer of the Privy Council discusses in his twelfth annual report that section of the Act which declares that the provisions of the Adulteration of Food Act shall extend to the adulteration of drugs, and that every such adulteration shall be deemed an admixture dangerous to health. This section, he observes, has not so far as his knowledge goes yet been acted on. Indeed, seeing that the Adulteration of Food Act is virtually a dead letter, no one, he thinks, could have expected that the extension of it could be very effective. There is, however, cause for congratulation in the fact that a principle of great importance has, in that section, been affirmed by the Legislature. The falsification of drugs he describes as a crime which, in the interest of public health, ought to be very severely punishable and very regularly looked after; for it so frustrates the best medical skill and may so steal away life after life, that it is really a kind of secret poisoning. Yet in the present state of the law, with so many just necessities for the health of the country unfulfilled, and with such great masses of fundamental sanitary laws to be amended or created, it may scarcely be expected that this particular grievance can be matter for immediate legislation. But on this head it is observed that important changes must be made in the kind of local authority needed to protect the public health, before the defects of the administrative machinery can be remedied, or the law relating to adulterations be brought into an efficient state.

Finally, Mr. Simon reports to their Lordships on the Regulations concerning Poisons. Here are his words on this delicate and important subject:—"I also regret to state that the very important power which the first section of the Act vests in the Pharmaceutical Society, to prescribe (with the consent of the Privy Council) regulations as to the keeping, dispensing and selling of poisons, has hitherto remained unexercised by the Society, and that, consequently, the public is still without the protection which such regulations might give, and which notoriously is much needed, against the danger of having poisons dispensed or used in mistake for harmless preparations."

So much has been said on this subject already by readers, writers and speakers in the Society, that it is probably unnecessary for us here to do more than merely lay before our members this official statement. Its weight and importance are apparent. On the other hand, the difficulties and complications which surround the question have also become very apparent. It is now under the consideration of a Committee, and will have to be once more debated by the members at large at a future time.

In an appendix Mr. Simon gives detailed reports from Dr. Christison and Dr. Greenhow on the Examinations of the Society, of which we shall reproduce the most important parts.

LIVERPOOL, SEPTEMBER, 1870.

Possessed of attractions for the technical chemist and the botanist, the geologist and the student of natural history, such as few districts afford, Liverpool is eminently attractive to the hard-worked druggist as well as to the man of science. The local committee are making great preparations to receive their pharmaceutical brethren, and promise a welcome which will doubtless be at least as warm as any previously accorded to the British Pharmaceutical Conference. Under these circumstances we are not surprised to hear that the number of visitors is expected to be very much greater than at any previous meeting, nor are we surprised that a large proportion of the thousand members who have recently joined the Conference are anxious to see what is done at these annual gatherings, and are not unwilling to be convinced of the immense value of this association of men of kindred pursuits.

Let us, then, note for the benefit of those who contemplate a visit to Liverpool and the Conference for the first time, that the Honorary Local Secretary, Mr. E. Davies, Royal Institution, Liverpool, will be happy to forward every information concerning lodging and hotel accommodation.

On taking a retrospect of previous meetings we have been struck by the absence of some well-known men, whose exertions in the cause of true Pharmacy have contributed not a little to foster that *esprit de corps* which is now (poisons and poison regulations notwithstanding) so largely dominant in the trade. The veteran Morson, and the gay, open-hearted Hills, after boldly crossing the Exe last year to make new acquaintances and find old friends with new faces in the fine old city of Exeter, both testified in unmistakable language to the pleasure and profit they derived from their visit.

Cannot our esteemed President and zealous Vice-President follow their example with advantage? The various duties they have regularly to perform in London are known to us, and we would not claim to interfere with their well-earned repose during the holidays, had we not a certain amount of misgiving that the public character and influence of the Pharmaceutical Society throughout the provinces would be in some degree lowered by their absence from the most important professional gathering of the year.

The Society represents something more than its 2500 subscribing Members and Associates: it seeks to be and, we venture to add, is representative of the whole trade; its influence in one form or another is now felt by *every* chemist in Great Britain. It would then be a graceful compliment to its young and prosperous offspring, if the Council were to appoint as one of its numerous delegates to the approaching meeting the chief actor in the struggle for the Pharmacy Act of 1868, the man whose portrait, removed from the Royal Academy Exhibition, we are proud to hear will decorate the walls of the examination room next October. Domestic bereavement, public and private cares of no ordinary kind have been his lot during the last few months, and we would not willingly add further burdens; but our provincial friends, anxious to take a more active part in the working of the Society, naturally desire to make the personal acquaintance of its leading members. Their inclination and willingness to undertake fresh duties cannot be questioned, and in regard to Mr. SANDFORD, we feel so confident that his presence in Liverpool would be of service to the Society, as well as to the Conference, and so gratifying to himself, that we do not hesitate to urge the importance of his not neglecting this favourable opportunity of taking counsel with his constituents and friends.

The Vice-President, Mr. HASELDEN, would bring a large practical experience to bear on the questions for discussion, while, as an active, painstaking and popular member of the Board of Examiners, he would most certainly be cordially received. The views we have advanced in regard to the officers of the Society apply with equal force, *cæteris paribus*, to the Councillors and Examiners generally. Their attendance hitherto has not been so numerous as we could wish, and we are disposed to think that many opportunities for useful work have been for the time lost, owing to the scarcity of the *initiative* element of the Society at former meetings. Never has there been a more appropriate time for those who consider that the duties of *office* necessitate other sacrifices than those of regular attendance at Bloomsbury Square, to show their sympathy with chemists and druggists generally.

We hope to see in the Liverpool list, amongst others new to the Conference, the names of BOTTLE, EDWARDS, BROWN, WOOLLEY, WILLIAMS, ALLCHIN, DARBY, GALE, REDWOOD, etc. Edinburgh may be relied upon for sending JOHN MACKAY. Without his genial spirit, it may be safely affirmed that no Conference, social, political, or otherwise, *can* be complete. We can predict, with some confidence, that all the guests assembled this month at Liverpool, will, on their departure, carry away with them an impression far more lasting than any that can be produced, solely by what our American neighbours designate, "a phenomenal cataract of verbal influences."

ODISSE QUEM LÆSERIS.

We have been reminded by several correspondents that the *Lancet*—which lately gave publicity to the opinion that medical men ought not to be called upon to sit in the same room with Pharmaceutical Chemists at a public exhibition, and that chemists were by no means fit company to be publicly associated with by medical men at the Polytechnic—this week completes, as we presume, its bouquet of compliments by designating the class represented by this Journal as "malefactors" who are in the habit of "prescribing in the dark."

We shall not, however, be at any pains to disclaim the title for which pharmaceutists are thus indebted to the discriminating courtesy of our contemporary for in its more sober moments, or at a period of stricter editorial control, we shall fully expect to see a spontaneous *amende*.

EXEMPTION FROM JURIES.

We desire to draw the attention of Pharmaceutical Chemists to the fact that this is the proper time, for those who desire to avail themselves of their privilege in this respect, to take notice whether their names are included in the List of Jurors affixed to the parish church doors on the three first Sundays in September, and in that case to make their objections as prescribed by the Juries Act, 1862.*

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

We have much pleasure in acknowledging the following additional contributions during the past week, and in thanking those who have already subscribed towards alleviating a calamity which the *Times* has well characterized as a wholly exceptional outburst of the fearful forces which human nature, as much as physical nature, has in store,—a calamity all *are* bound to relieve as one concerning all humanity. We desire, at the same time, to urge upon those who contemplate subscribing, that the pressing nature of the case requires prompt action, and we feel the more impelled to do this because, in the lists of contributions hitherto published, the names of many leading pharmaceutists have yet to be enrolled. This is the case with the Local Secretaries throughout the country, who, of course, cannot be expected to respond so promptly as individuals, since they have the extra trouble of collecting subscriptions. This is a work of time, and while tendering our thanks to those local secretaries who have been the first to send in collections, we trust to finding them before long well supported by their colleagues in other places.

The frightful magnitude of the suffering now being undergone by the wounded soldiers of both armies, is such as to eclipse altogether ideas of nationality or predilections in favour of one side or the other.

* See PHARMACEUTICAL JOURNAL, s.s., iv. 95.

	£.	s.	d.
H. Blacklock, Bournemouth	0	10	6
Alfred Brady, Newcastle-on-Tyne	2	2	0
Henry B. Brady, Newcastle-on-Tyne	3	3	0
Charles Cracknell, 217, Edgeware Road	1	1	0
Stephen Darby, 140, Leadenhall Street	2	2	0
W. B. Dyson, 4, Gloucester Road, S.W.	0	10	0
Charles Eve, Hampstead	1	1	0
Fisher and Haselden, 18, Conduit Street, W.	1	1	0
William Hodges, Eastgate Row, Chester	1	1	0
R. Hovenden, 5, Great Marlborough Street	0	10	0
B. Humpage, Turnham Green	0	10	0
C. J. Mellin, Eltham	0	10	0
T. M. Orpe, 329, Old Kent Road	0	10	0
Thomas Taylor, 81, High Street, Peckham	1	0	0

Per W. Wilkinson, Local Secretary, Manchester:—

	£.	s.	d.
A. B.	0	1	0
W. Bentley	0	5	0
W. Carter	0	10	0
E. D. M.	0	2	6
Goodsby and Co.	0	10	0
C. Haywood	0	10	0
J. G. R.	0	5	0
J. J.	0	5	0
J. P.	0	2	6
J. W.	0	2	6
J. W.	0	2	6
Thomas Kerfoot	0	5	0
L. A. J. B.	0	2	6
Lynch and Bateman	0	10	0
J. Massey	0	2	6
Mottershead and Co.	1	1	0
H. G. Mumbray	0	5	0
Henry Mundey	0	5	0
No name	0	2	6
R. L. Pickup	0	5	0
G. Pool	0	2	6
R. L. S.	0	3	0
S. D.	0	2	6
G. C. Sanderson	0	2	6
H. Sanderson	0	2	6
T. B. M.	0	5	0
T. F. R.	0	2	6
T. R.	0	5	0
R. Twemlow	0	2	0
W. G. S.	0	2	0
W. H.	0	1	0
E. Walsh	0	5	0
Westmacott and Son	0	5	0
W. Wilkinson	0	10	0
G. Wilkinson	0	5	0
James Woolley	2	2	0
S. Wylde	0	5	0
Total	£10	17	0

W. J. Bates, Macclesfield:—
12 bottles 1 grain opium pills.
12 bottles ¼ grain morphia pills.
6 bottles 2 grain quinine pills.
(each containing 4 dozen pills.)
4 sponges.

James C. Chubb, 102, St. John Street, E.C.:—
12 dozen tin boxes of seidlitz powders.

John Day, 116, Briggate, Leeds:—
8½ lbs. of linen.
2 oz. sulphate of quinine.
2 bottles of Condy's fluid.

M. J. Ellwood, Leominster:—
6 lbs. patent lint, and piece of linen.

Robert Hampson, 63, Piccadilly, Manchester:—
12 gross 1 grain opium pills in bottles containing 4 dozen each.
12 gross ¼ grain morphia pills in ditto.
6 gross 2 grain quinine pills in ditto.
4 2-oz bottles of chloral hydrate.

Proceedings of Scientific Societies.

PARIS.—SOCIÉTÉ DE PHARMACIE.

6th July, 1870.

M. Lefort, President.

M. Bussy suggested that the Society should exchange the report of its proceedings with the several other pharmaceutical societies in France which publish reports: the proposition was referred to a committee.

M. Maget presented a number of specimens of materia medica brought from China by the Marquis d'Hervé de Saint-Denis. M. Jeannel referred to the extended investigation of the subject published by M. Debeaux. A committee was appointed to make a detailed examination of the collection.

M. Bussy presented, on behalf of M. Carles, a memoir on the dissociation that oxalic acid undergoes in a boiling aqueous solution under the influence of a current of gas —oxygen, hydrogen, carbonic acid. The products formed are carbonic acid and formic acid.

M. Planchon laid before the meeting a number of drawings representing the anatomical structure of drugs, remarking upon the great constancy of the general micrographic characters, either in the species of the same genus or in varieties of the same species. He showed that this mode of examination was remarkably adapted for distinguishing the barks known as canella, and pointed out the striking differences existing between those belonging to the family *Laurinaceæ* and those improperly designated by that name.

M. Lefranc read the first part of a paper on inuline.

M. Duroy suggested that the Society should pronounce an opinion on the application of fluid extracts for the preparation of certain syrups.

M. L. Soubeiran read a report recommending that MM. V. Herran, Howard and Zaldivar should be elected corresponding members.

GRANT COLLEGE MEDICAL SOCIETY, BOMBAY.

July, 1870.

A New Indian Remedy.

BY MR. NARAYAN DAJI, *Graduate of the Grant Medical College.*

(*Continued from page* 176.)

Synonyms.—This plant is the *Ailanthus excelsa*, Roxb.; W. and A. Prod. i. p. 150; Roxb. Fl. Ind. ii. p. 450; De Cand. Prod. ii. p. 89: Spr. Syst. i. p. 939; Willd. iv. 974; Roxb. Cor. P. t. 23; Wight's Ill. Ind. Bot. i. t. 67. In the vernacular languages of India it is known by the following synonyms:—

Aralu, Sanskrit; *Araduso*,* Gujaráti; *Mahárúkha*† (lit. great tree); *Mahádunga*, *Mahánimba*,‡ Maráthi; *Peru maram* (lit. great tree), Tamil; *Pedda mán chettu* (lit. great tree), *Pedda mán*, *Pedda mánu*, Telugu; *Arar madára*, Hindi, (Allahabad).

Etymology.—The generic name, *Ailanthus*, is derived from *Ailanto*, the name of *A. glandulosa* in the Moluccas,§ which signifies "the tree of heaven," so called from its

* *Aradusi* is the name in Gujarati of *Adhatoda Vasica*.

† *Mahárúkha* is also the name in Maráthi of *Cinnamomum Tamala* and species; the other synonyms are corruptions of the above. It is so named probably from its immense size.

‡ This name signifies "great Nimba," so named probably from some resemblance of its leaves to those of "Nimba" (*Azadirachta Indica*). *Mahánimba* is also the name of *Melia Azederach*.

§ See Don's 'Gardening and Botany,' vol. i.; Miller's 'Gardener's Dictionary,' vol. i. Ail.

lofty growth. The specific name *excelsa* refers to its great height.

BOTANY.—The genus *Ailanthus* has at different times been variously placed by systematic botanists. It was formerly referred by De Candolle to his tribe *Connaraceæ* of

Ailanthus excelsa, Roxb.

the Order *Terebinthaceæ*.* A closer research led for a short time to its transference to the extensive Order *Rutaceæ*, of which "*Ailantheæ*" was considered a second suborder by Dr. Arnott, and which was partially referred by Meissner to the distinct tribe of *Zanthoxylaceæ*. Bentham and other later systematic botanists have placed this genus in the Order *Simarubaceæ*, an arrangement which is here adopted.

"*Generic character.—Ailanthus*, Desf. Act. Acad. Paris, 1786, 263, t. 8. Flowers polygamous. Calyx small, 5-lobed. Petals 5, valvate in the bud. Disk 10-lobed. Stamens 10, fewer or none in the female flowers; filaments without scales. Ovary 2- to 5-lobed; styles connate, with plumose stigmas; ovules solitary in each cell. Fruit of 1 to 5, oblong, membranous samaræ thickened in the centre round the seed. Seed flattened, testa membranous: albumen scanty; cotyledons leafy, nearly orbicular. Trees. Leaves alternate, pinnate; leaflets oblique; flowers small, in terminal panicles."†

"*Specific characters.—A. excelsa*, Roxb. Trunk perfectly straight, rising like that of the fir-tree to a very great height. Bark smooth, ash-coloured. Branches pretty numerous, ascending. Leaves about the extremities of the branchlets, abruptly pinnated, generally about three feet long. Leaflets short petiolated, from ten to fourteen pairs, obliquely oblong, or somewhat sickle-formed, the nerve runs so as to make the exterior portion twice as broad as the interior, very remotely and grossly serrated or indented, smooth, about four inches long and two broad. Petiole round, smooth. Panicle terminal, very large. Bracts minute. Flowers exceedingly numerous, small, slightly tinged with yellow, hermaphrodite and male mixed."

Hermaphrodite Flowers.—"Calyx as in the genus. Petals five, many times larger than the calyx. Nectary or receptacle is a perforated, glandulous, notched body, which surrounds and in a great measure hides the germs. Filaments ten, shorter than the petals, inserted into the lower edge of the nectary. Germs above, from one to four, very minute, immersed in the perforation of the nectary. Style none. Stigma small. Capsules from one to four, but generally one or two; not connected at the base, linear, oblong, surrounded with a large membranaceous wing, a little twisted at the apex and base. Seed one, flattened."

Male Flowers.—Calyx, corol, nectary and stamens as in the hermaphrodite, but no rudiment of a pistil.*

The tree flowers in the cold season, and ripens its fruit in April and May. Its wood is soft, white and light; it is readily attacked by insects. At Baroda and other places the wood is used for making handles and sheaths for swords and for other light work; in the Circars it is commonly made into catamarans.

HABITAT.—This species of Ailanthus is found in a native state in India and in Ceylon. Roxburgh mentions it as an immense tree, a native of the interior of Coromandel. It flowers during the cold season.† Royle found it around Delhi, along the Jumna, as well as on the Coromandel coast.‡ It is found growing in the jungles of Travancore, Coorg, Mysore, Malabar and Ceylon.§ In the Bombay presidency it chiefly occurs in Gujarat and Kattiawar, particularly so near Ahmedabad, Baroda and Broach; and is thinly scattered over the Deccan.

Its growth is not so rapid as one would believe from the soft nature of its wood. At Mehmoodabad a tree of the age of about seventy years is to be seen. Its circumference at the base measures eight feet. Trees of still larger girth and greater age are seen in other parts of India.

This tree grows on the plains and open valleys, amongst mountains and a few miles inland from the coast. It thrives on a somewhat barren sandy alluvium containing limestone. In Gujarat, particularly about Ahmedabad and Baroda, it flourishes in the neighbourhood of villages where the soil abounds in calcareous matter, which largely enters into the structure of this plant. A somewhat dry climate having a considerable range of temperature appears to be favourable to its growth.

SOCIETY OF ARTS.

ON FERMENTATION.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture I.—continued.

Now, the question arises whether this formation of acetic acid ought to be classed, as I am at present classing it, amongst the processes of fermentation. If it is due to the absorption of oxygen, you might naturally inquire whether one ought not to place it amongst the common processes of combustion, and it is right that I should state that by some authorities it is at present so classed. My reason, however, for stating what I have done, that it is a process of fermentation, is this, that it is usually effected by the action of a peculiar organism, called a vinegar-plant, an organism which I shall have occasion to show you hereafter, which does exert in that particular process the function of taking up oxygen from the air and of inducing the alcohol to combine

* Wight's Ill. Ind. Bot., p. 169.

† Bentham's 'Flora Australiensis,' vol. i. p. 373.

* Roxburgh's 'Coromandel Plants,' vol. i. p. 24.

† Roxb. Fl. Ind. vol. ii. p. 450.

‡ Royle, Ill. Himal. Bot. p. 157.

§ Cleghorn, Forests of S. India; and Moon, Cat. Ceylon Plants.

with it. There are many other processes by which we could get it, but the actual process by which we do get it is a process in which this vital organism, the vinegar-plant, is the agent of its formation. It might be made by mere processes of combustion, but it is made by a process of fermentation.

There is one singular feature in the first and best known of these processes—the alcoholic fermentation—which you will notice when I tell you something of the way in which the processes of fermentation present themselves, even without very great care on the part of the observer. If, for instance, you were to express the juice of some sweet fruit—say grapes—and if you were to leave that expressed juice in contact with the air for a little time, having first squeezed it through some suitable cloth or filter, so as to have it clear, of course there would be no solid particles in it when you put it aside; but, if you leave that in a tolerably warm place, in contact with the air, you would find that little solid particles would appear in this juice, that they increase in number, and that, in proportion as they increase in number, and as the quantity of them becomes greater, so does the process of effervescence—the evolution of gas from the grape juice—become more and more rapid. These little solid particles, which are not present at first in the grape juice, but which gradually make their appearance when it is exposed to the air, are what we commonly call, in the ordinary case of alcoholic fermentation, in this country, yeast—either beer-yeast or wine-yeast; it is the same organism in each case. The peculiarity of the process is this, that these substances—this yeast—which seems to make the sugar into those products which I enumerated to you, does not disappear while doing the work, but is produced by the very process. The more active the production of these yeast-cells, and the more speedy the growth of these yeast-cells, the more effective and rapid is the process of fermentation, and no fermentation of the kind which I am speaking of at present—the alcoholic fermentation—has ever been known to take place in the absence of these organisms. That circumstance I just mention briefly at present, but the fact that these yeast-cells appear whenever the process is going on—and the more they grow the more rapid is the fermentation—has led people to suppose at first, and to believe afterwards, that these yeast-cells were the agents of the transformation, the active substances which decomposed the sugar in contact with the water, and induced the transformation which we noticed. Now, the very fact that one of the two substances which are reacting upon one another chemically (because the changes are chemical in their fundamental nature), should not disappear, but should rather increase by the process, is entirely anomalous—it is entirely at variance with the simplest and best known facts of chemistry, so much so, that if it were not established upon incontrovertible evidence, I believe that most chemists would be inclined to disbelieve it, and to say it cannot be,—it is impossible,—it is a mistake. If you tell me, as a chemist, that this yeast is transforming sugar by its action on the sugar, and that instead of being consumed the yeast is actually increased in quantity by doing that work, I should say it is nonsense—it cannot be, because in all the cases of chemical action which I know best, nothing of the kind occurs, but the very opposite. When one substance acts upon another, each one disappears in the process, and is transformed into a product having other properties. I need hardly give you illustrations of that; but one or two simple cases may not be useless, as serving to fix clearly this important circumstance in your minds.

I will take at first one of a particularly elementary and simple kind,—a process of combustion. I will take a little strip of metal—magnesium wire—and will hold it for a short time in the flame of a spirit lamp, so as to raise it to a sufficiently high temperature. The light you see emitted is due to the combustion of the oxygen in the air with the metal magnesium, which I hold in my hand. This is one of the simplest possible cases of chemical action. The metal has disappeared. The strip of wire is gone, and oxygen from the air disappeared also. At the same time a white powder was formed. I dare say you did not notice it, but here is a quantity of the same substance in a bottle. It consists of oxygen from the air combined with the metal magnesium, and the point is this—that all the magnesium which took part in that process disappeared and went to form this white powder, and all the oxygen which took part in the process also disappeared. The two united together, each disappeared as such and went to form this new product. And, moreover, we can tell, from an examination of the proportions in which the substances combine, exactly what weight of oxygen would disappear for every part by weight of magnesium. If you burn, for instance, three grammes or three pounds of magnesium, you would require exactly two grammes or two pounds of oxygen. For instance, three pounds weight of magnesium would combine with two pounds weight of oxygen, and the product of the two together would be five pounds in weight. I may show you the same thing with soda, not the substance which is commonly called by that name, which is a carbonate of that base. I have here a little pure soda solution in a bottle. I will pour some into a beaker-glass, and I will show you one property which characterizes it, viz. that of changing the colour of this red paper into blue. Now, I will pour some of this acid body, the oil of vitriol, into another beaker-glass. If I put the paper which has been discoloured into this pure acid, it would be dissolved; but I will dilute some of it with water, and then you will see that paper, which has been rendered blue by the agency I have just used, is brought back again to red by the agency of this acid. Now, if I mix the acid with the soda, we shall have audible evidence of violent action going on. I will not go on with the process, but I have purposely taken the two substances in presence of very little water, in order to show you that the heat evolved makes the liquid boil with great violence. I could have avoided that by adding water in the first place, but I wished to show you the vigour with which they unite together. If I were to go on adding acid to the soda, little by little, feeling my way until I had just completed the action, I should have got some water formed and some of the beautiful salt which I have here,—a body which is neither soda nor acid; it is a salt called Glauber salt or sodic sulphate, and all my materials would have disappeared in the process. If I use them in proper proportions, all the acid and soda would disappear and go to form these two other products. I might dissolve some of this sulphate in water, and might put red paper or blue into it and it would not affect either of them; it is perfectly neutral in that respect. The proportion by weight in which this combination takes place is this. If I add 40 parts by weight of soda, and 49 of oil of vitriol in a state of purity, I should have as the result, 18 parts by weight of water, and 71 of sodic sulphate, and if I add together the weight of my materials and the weight of my products, I get the same—89. Nothing disappears in the process; all the acid and all the base which takes part in it is employed. Each particle which took part in the process disappeared as such, and it passed over into another form.

I will mention one other case, because it is somewhat more complex. I may take the case which I was showing you just now, the white marble and hydric chloride or muriatic acid, which I used for making the carbonic acid gas. In that case, I used two materials, carbonate of lime, as it is commonly called, and hydrochloric acid. We get three products; on the one hand is a salt, which is commonly called chloride of calcium, a solid substance used for drying gases, as it has a great affinity for water; another is water; and the third, as I showed you, carbonic acid gas. There, again, we have precisely the same thing. All the marble and all the hydric chloride which takes part in the formation of those three products disappeared as such, and they resolved themselves into other compounds possessing different properties; but the weight of the products is equal to the weight of the materials. That rule holds good throughout all ordinary cases of chemical action.

On the other hand, in fermentation it is not so; one of the active substances is formed, and the more active the fermentation, the more does it grow. In fact, if you want to get yeast, you must go to a place where the breaking up of sugar into alcohol and carbonic acid is going on; or if it is in the south, you must go to where wine is being made, you go to a wine-maker, and get the yeast from him. The only way of getting yeast is from that process of fermentation which sets in spontaneously under the conditions I named to you.

I ought, however, in justice to the wonderful process which I alluded to, to give you two or three other particulars regarding it. I showed that sugar is broken up by the ferment into these products, but no case is known of pure sugar—and when I say pure sugar, I mean sugar in the purest form in which we have it—being decomposed by yeast. If you were to put some ready-made yeast—thriving, growing, yeast—into a solution of chemically pure sugar, some of your yeast would decompose, some of it would resolve itself into other products, and other parts of it would be absorbing those products which are present in the liquid, and whenever the process is to be carried on advantageously and rapidly, it is customary to add some saccharine liquid—some other substance capable of nourishing the yeast. When I want good fermentation I do not take water to dissolve my sugar and put yeast into it, but I boil some of this malt, which is one of the best materials for the purpose, in water, and take a decoction of malt or decoction of yeast and put the sugar into it. In such a liquid there are several bodies which we know; and I may safely say that there are a great many others which we do not know, and there is no doubt that their presence is of considerable importance to the chemical change which takes place. There are substances which I shall presently have occasion to show you and to speak of, formed by the germination of the grain, by the formation of the malt, which are related somewhat to this body which I have here. This was some pure wheat flour—every kind of flour would not do—and it is supposed that some people mix other materials with flour. It was kneaded up with water, pressed together, and, whilst the pressure was being continued, water was allowed to trickle over it. I have in another bottle some of the water that flowed over it. There is a white substance deposited from this water, which is commonly known and much used by the name of starch, and starch is, in its chemical composition, first cousin to sugar; it is a substance which passes over very readily into a kind of sugar by a process I shall presently have occasion to allude to. But the little ball of flour while being kneaded had the starch washed away from it, and I have left, as the result, a substance which is commonly known by the name of gluten. If I were to describe it in chemical language, I should say it is something like flesh, or the muscular fibre of animals, for, in chemical composition, it approaches very nearly to that. When barley is malted, and kept in a warm place for some time, the grains begin to germinate and decompose, and some bodies are formed from this gluten, which is partially broken up. The malt contains also some sugar made from that starch—grape sugar, as we usually call it.

If we had only these extreme cases, I really do not know what we should do. If we had in our science one set of bodies which appeared so constantly to act at variance with the general laws which the others obey, I think we could not call chemistry a science. I have taken two or three examples to show you the definite proportions which we find to regulate the ordinary process of combination. I might have taken thousands, but the point is that this law does not appear to apply at all to these chemical changes which we call fermentation. One of the active substances in fermentation is being formed, it is increasing, not disappearing at all, and the contradiction is so strong and manifest that the only way out of the difficulty will be to do something of the kind which I was speaking of some time ago, that is to say, see if we cannot get some intermediate facts which will serve to connect the extreme ones; to see if we cannot get at first something between the two classes, and then try to get some further links between them. There are processes of chemical change—I will not call them processes of fermentation, for I do not know whether they are, but which are analogous to it, and some of them are very interesting and very beautiful. I have here a substance called amygdalin, made from bitter almonds. It is a bitter-tasting substance and consists of four elements which it is not necessary that I should name. In this other bottle I have a paste formed of sweet almonds, which have been crushed with a pestle and mortar, and I will put some of it into the warm distilled water in this flask. Into the mixture I will put some of this amygdalin. If I were to leave it without that addition, there would be very little change; the substance would gradually subside, but there would be no product given off in the way you will presently see. After letting it stand for a few minutes, I will pour some of the mixture into an open vessel, and we shall be able, without difficulty, to perceive a fragrant smell, which is due to the presence of a liquid of which I have a quantity here, a substance known by the name of oil of bitter almonds. If we were to perform the same experiment on a large scale, and macerate some of this amygdalin with almond paste, put them together with warm water, distil the mixture and collect what comes over, we should find that water would pass over and with it would be a few drops of oil of bitter almonds, and the amygdalin would be decomposed in the process. There is in the sweet almond paste a substance which I cannot describe in better terms than by comparing it to that gluten which I showed you just now. It is very similar to it in its composition, and by the contact of this, the synaptase, as it is called, with the amygdalin, the elements of the amygdalin are broken up into several products; one of them is the oil of bitter almonds, another is prussic acid, which generally accompanies the oil, the third is a variety of sugar of the kind which is called grape-sugar and there is probably also some formic acid. Here we have the breaking-up of a complex body—amygdalin—into several simpler bodies by the action of the body called synaptase; but there is not in the process, as far as I know, any living organism at work. There is a substance which is somewhat similar to these living organisms, but there is no organized structure, as far as our knowledge goes at present.

Take another experiment. I have here something which is not a *blanc mange*, although it looks something like it; it was made by boiling potato-starch with water. We let it cool, and then turned it out; some was put into a flask with two or three ounces of crushed malt. It was warmed to a temperature of 60° Centigrade for about an hour; there was no boiling. The substance was then squeezed through a cloth to keep back the husks of the malt, and here is the liquid which ran through. It is perfectly liquid, and its consistency is entirely different from that of starch, from which it was made; it is quite sweet to the taste, and there is a large quantity of sugar in it. There is also another body which we class with the sugars; that is, there is in this liquid a good deal of a kind of gum, which we call dextrine, which would easily pass into sugar. The starch, when it was being converted by the action of the malt into those soluble bodies, did not, so far as we know, break up into simpler substances; the process was of a different kind. It assimilated the water—the starch combined with the water, and at the same time divided itself, some of it forming one and some the other product. Here, also, there was not, as far as my knowledge goes, any ferment or any organized cells in the liquid. If they were present it was an accident, and was not essential to the change which took place. I am the more confident in saying that no ferment was there present, for we can get, and we very often do get, precisely the same formation of starch without any malt at all. If, instead of warming some of that starch with the infusion of malt, I had mixed it with a little—about five per cent.—of that strong sulphuric acid, and had heated it, it would have been dissolved almost like sugar in water. In fact, there are now in Germany, and also in England, manufactories in which starch is converted, by the action of dilute sulphuric acid, into grape-sugar, and the same change which we get by organic substances —that is the point—we also get by the action of this mineral acid.

Another change of the same kind I may mention, especially as the subject of it is in itself interesting. I have here a substance which people have been accused of making for the purpose of adulterating quinine. It is made from willow-bark, and is believed to possess febrifuge qualities, so that there was some little excuse for what I have mentioned. This substance is called salicine, and when heated with dilute sulphuric acid, in the same way as the starch when so heated was converted into sugar and dextrine, this salicine breaks up in a way which I might compare with that in which some bodies are broken up by fermentation.

Another case of the same kind is afforded by tannin, a substance extracted from gall-nuts, and which is present in oak and many other barks. It is used for combining with gelatine, which is the principal constituent in hides, to form leather. If we dissolve this tannin in water, and leave it in an open vessel, it will get mouldy; and if you examined it after some time you would find none of it left. It would all disappear, just like sugar in the process of fermentation, and in place of it you would find, in that particular process, a body which you might easily crystallize out from the liquid, and which I have here; it is called gallic acid. It is a body resembling tannin in some respects, for instance, in the property of forming, in combination with iron, a dark substance, which is used in suspension in water, for writing-ink. But it will not do to form leather in combination with gelatine. If you left the tannin in an open vessel, it would decompose, and there would be left gallic acid, and some other material which was formed at the same time would have disappeared. By boiling tannin with dilute acid, we get the process performed more regularly. Upon boiling some tannin with dilute sulphuric acid, you would find that water would be taken up by it, the tannin would combine with water, and it would break up into sugar and gallic acid, the process being exactly like that which I mentioned in the case of salicine. There is a most direct analogy between the process of breaking up which sulphuric acid effects upon tannin and that of fermentation. I ought to say, when telling you of the decomposition of the tannin, that it is effected by little animal organisms present in the liquid, and it appears that they are the agents of the transformation.

Then there are some other processes of considerable importance, from their occurrence in the animal economy —processes which I believe must be classed between those experiments which I showed you a little while ago and the process of fermentation,—I mean processes which occur in the operation of digestion. I have here a gelatinous solid, which contains a substance called pepsine, which was made by dissolving the inner lining of a pig's stomach in diluted hydrochloric acid at about blood-heat. The inner lining of the stomach of that and similar animals is dissolved gradually, and that solution possesses the property of dissolving muscular fibre, white of egg, and other similar substances; it is, in fact, artificial gastric juice, and it would, for instance, dissolve that lump of gluten which I showed you just now —which looked something like india-rubber—and when this pepsine dissolves albumen by digestion, for the process is doubtless of the same kind as that which occurs in the animal economy, it does so by breaking it up into bodies which are no doubt simpler than itself, bodies which we do not know accurately and fully. They are called peptones, for it is common enough to give names to bodies even before one knows them well. I do not know whether it is a good plan, but it is customary. These bodies are a good deal similar to those which are present in malt, and in such like mixtures which have undergone vital changes.

Then I will give you one or two other cases of similar processes. Here is a singularly beautiful acid, called hippuric acid, which decomposes with very great readiness if left in the liquids in which it is originally found. When that organic mixture is exposed to the air, it undergoes a process of putrefaction. The general appearances which take place in the liquid while the substance is decomposing would certainly be described by anybody as a putrefactive process, and there is formed by its decomposition some of this other beautiful acid, called benzoic acid, because it was originally obtained from the fragrant gum benzoin. At the same time there are other products given off which decompose. Now, we can by mineral substances effect the same decomposition of that hippuric acid. A German chemist, to whom we owe many researches in these matters, showed, some years ago, that if you boiled hippuric acid with dilute sulphuric acid, it takes up water, and breaks up into benzoic acid, and this crystalline substance, called glycocol or sugar of glue. It got that name from the circumstance that it was obtained originally from glue by a decomposing action, and it has a sweet taste. It has no analogy to sugar in its nature, but it has that superficial resemblance that it is rather sweet.

This hippuric acid affords another case of a body which is broken up either by putrefaction, or by the action of dilute sulphuric acid. It affords a strong argument, and other cases I have adduced afford, like it, an argument that the action of these organic substances resembles the action of sulphuric acid. If we get the same change in several cases by the action of an organic body as by the action of a mineral body, the fact certainly goes some way towards showing that the two substances must be, in their mode of action, generally alike. There is another case, that of urea, which in contact with water forms a carbonate. That may be done by either class of re-agent.

There are, however, some chemical processes even simpler than these, and for that reason they are better known to us, which really may be studied with advantage side by side with those I have mentioned, and they will, I think, afford us, on further consideration, a key to the explanation of these processes. I will only mention two. One is a process which is well known in its general features, and it is a process of breaking up truly analogous to those I have mentioned, but a perfectly simple breaking up of alcohol into two substances, both of them well known now, one being water, and the other ether. It is a process which consists in dividing the elements of alcohol in such a way as to get nothing formed but these two products, though side by side with this change there are some secondary changes which do not belong to the process. This change is effected solely by the action of oil of vitriol or sulphuric acid. It has been long known, and it was a subject of wonder for some time that, if sulphuric acid is mixed with alcohol and heated, you can distil off some alcohol from the mixture in the form of these two products; then you may add some more alcohol, and if you distil that off, it is also broken up into ether and water; then you may add some more again, and you may go on adding alcohol to that original quantity of sulphuric acid, and it will decompose each successive portion into these two products. There is no limit known to the extent to which sulphuric acid will effect that change. You perceive, therefore, that this, in its general features, is a process analogous to those which we were considering at first.

I may illustrate that by an experiment. First, I will show you how we discover the presence of sulphuric acid. The common test is, to add some salt of baryta—this which I have here is a chloride—to the sulphate, when we get at once a precipitate, sulphate of baryta. The sulphuric acid, in making the ether, passes over into a compound that does not possess this property. I have some of it here. It is a clear liquid, and on mixing it with the same re-agent I used just now, you see that it will not form the precipitate; I put some of the same baric chloride into it, but, as you see, the liquid remains clear. But I can bring back my sulphuric acid to its original state. Mr. Taylor, my assistant, was heating some of it just now, and it has been standing so long that it has returned to its original state already. It has returned from the state in which it does not precipitate baryta to the state in which it does. There is in the process a successive departure of the sulphuric acid from its ordinary state, and a return to that original state; it is a kind of circle or cycle. The substance passes over into a compound which does not precipitate baryta, and then it returns again to its original form, and that is the key to the anomaly. When the sulphuric acid has effected the decomposition of one portion of alcohol into ether and water, it comes back again to sulphuric acid, becomes exactly what it was in the beginning, and is able to recommence precisely the same combination. I will give you another example of it. I have here a substance used in one of the commonest manufactures, that of oil of vitriol, in which the same operation occurs. I have there a substance at work called nitric oxide. It is converting a quantity of sulphurous into sulphuric acid. In principle it would so convert an infinite quantity, but in practice it is limited by convenience. It acts by carrying oxygen from the air to one portion of sulphurous acid and then to another, and thus it goes on, and effects successive oxidations of a great number of particles of sulphurous acid, forming sulphuric acid from them, and it does that in virtue of a process perfectly analogous to that which I just now mentioned. The gas, after one operation, returns to the same state in which it was in the beginning of the first operation; it is a cyclical process. I have here some of the nitric oxide combined with oxygen, and when in that state it has the red colour which you see in the flask. If we blow a little sulphurous acid into it, the red colour will disappear as the nitrous acid gives up the oxygen, the nitric oxide itself being a colourless compound, but in combination with oxygen it is red. As the sulphurous acid passes into it, the nitric oxide parts with the oxygen and becomes colourless, but on again blowing in a little oxygen it returns to its former red colour. This shows you that there are processes, of simple, normal, chemical action, somewhat analogous to those fermentive properties which I formerly described. Each one of these processes takes place in perfectly definite proportions, the peculiarity being that one material which takes part in them returns at the end of one operation to the same state in which it was at the beginning of the operation, so that the processes are cyclical, and this re-agent is able, by acting successively on a large quantity of particles, to repeat its action very frequently upon them, and beyond what would appear to be its definite combining proportion. You see this red compound of nitric oxide and oxygen has lost a great deal of its red colour. I will not wait until it is completely bleached, but will blow in a little oxygen, when we shall get a return to the original deep red colour. This is the ordinary process by which sulphuric acid is made on a large scale in lead chambers. The sulphurous acid is allowed to remain a considerable time in the chamber, and is passed on from one to another, as it is acted on by the nitric oxide, which passes through the successive stages of its action by a process which I should be glad to name cyclical, as I shall have occasion again to revert to a similar process of the same name. At our next meeting I shall have to analyse some of the best known, and also some less familiar instances of cyclical action, that we may arrive at a conception of their nature.

Parliamentary and Law Proceedings.

In the County Court of Yeovil, *August 16th*, 1870.

The Pharmaceutical Society *v.* Colmer and Wife.

BEFORE CHARLES SAUNDERS, ESQ., JUDGE.

The defendants were husband and wife, and were sued for the penalty of five pounds, incurred by their using the title of Chemist and Druggist, neither of them being registered under the Pharmacy Act, 1868.

Mr. Flux (of London) appeared for the Society, and Mr. Wood (of London) appeared for the defendants.

Mr. Flux, in opening the case, said that the action was brought in the exercise of powers which the Society used with reluctance, as was shown by the fact of the case being but the third which had been brought under the statute. The defendants' course of conduct had rendered the action a necessity, because the title was used by them with distinct knowledge that they were violating the law; and upon the customary application being sent to them before action, they replied by a letter so defiant that to avoid the issue of a plaint was a virtual impossibility. The letters having been admitted, he read them as containing an admission that the defendants were using the title chemist and druggist, and then referred to the sections 4 and 15 of the Act of Parliament, as showing that the defendants had incurred the penalty, and that the register proved itself, and was conclusive in favour of the plaintiffs. As, however, the defendants were, by their attorney, prepared to admit the use of the title, he asked the Court to accept and record the admission, and also, as the defendants desired an opportunity of cross-examining the Registrar, he (feeling it desirable, in a matter of the kind, to pursue the most open course) should put the Registrar in the witness-box, and ask him a few formal questions, in order to afford the other side the opportunity for the cross-examination.

The Judge (to *Mr. Wood*).—Do you admit that the defendants used the title Chemist and Druggist?

Mr. Wood.—I do.

The Judge.—Then I shall take a note of the admission. What have you to say?

Mr. Wood then raised a technical objection to the form of the particulars of debt, but that was overruled.

Mr. Elias Bremridge was called, and proved that he was the Registrar of the Pharmaceutical Society of Great Britain and brought the action with the sanction of the Council of that Society.

Cross-examined by *Mr. Wood.*—I was appointed Registrar, and was authorized to bring this action by resolutions of the Council, which are recorded in minutes.

Mr. Wood (to the *Judge*).—I raise the objection that the facts of the witness being the Registrar and being authorized by the Council, can only be proved by production of the minute-book.

Mr. Flux.—I submit, Sir, that the witness derived his authority not from the record of the resolutions in the minute-book, but from the resolutions themselves as they were orally passed; that the witness is acting in the exercise of powers cast upon him by the Legislature; and that he is not to be called upon to prove his authority by the production of any minute or other books.

The Judge.—I consider that the objection is untenable and shall allow the case to proceed. It is never required of officers of the army or others acting in public capacities that they shall produce their commissions or other written authorities. It is enough for me that the witness is acting in the capacity of registrar in the bringing of this action, and that no evidence calling his status in question has been given; but I will take a note of the point, in order that Mr. Wood, if he pleases, may look into authorities and bring the subject before me by way of motion for a new trial.

Mr. Flux.—Perhaps your Honour will take judicial note of the fact that in the Register of Chemists and Druggists there is printed the full name of the witness, with his description, "Secretary and Registrar of the Pharmaceutical Society of Great Britain."

The Judge.—I will do so.

Cross-examination continued:—I received from the defendant Mrs. Colmer, forms filled up according to Schedules C and D of the Act. The one was signed by her and the other was signed by a person purporting to be a duly qualified medical practitioner and whom I believe to be a son of the defendants; they were dated 30th November, 1868. I received afterwards similar papers dated the 20th March, 1869, and signed by the male defendant and by the same medical practitioner, and I afterwards received papers dated 6th April, 1869, also signed by the male defendant, giving his address as of a place in London, and purporting to be signed by a duly qualified medical practitioner.

The male defendant tendered to me £5 as provision for fees upon the registration of his name.

Re-examined.—I was not satisfied by either of the sets of papers, and I did not enter the names of the defendants or either of them upon the Register of Chemists and Druggists. The judgment exercised by me upon the papers was so exercised *bonâ fide*. The cases of the defendants are not the only cases, by many hundreds, in which papers in due form failed to satisfy me. I have informed both of the defendants, over and over again, that they have not been placed on the Register. The statute gives an appeal to the Council, but no appeal by either of the defendants has ever been made.

Mr. Flux.—That is my case, your Honour.

Mr. Wood then, without calling witnesses, addressed the Judge upon the facts, and contended that, it having been elicited upon cross-examination that each of defendants had sent to the Registrar forms in accordance with Schedules C and D of the Act of Parliament, it was thus proved that the defendants were, by force of the clause numbered 5 in the Act of Parliament, chemists and druggists, and as such entitled to be registered; but that whether they were registered or not, they were chemists and druggists within the meaning of the statute, and not exposed to the penalty for which the action was brought.

Mr. Flux contended that the published Register was conclusive against the defendants that the Registrar had exercised *bonâ fide* a *quasi* judicial function, and that it was not contemplated by the statute, or in accordance with the practice of the law, that the *bonâ-fide* decision of the Registrar should be revised by a Judge sitting in a Court; that the issue before his Honour was not whether the defendants were entitled to be placed on the Register, but whether not being on the Register, and using the title Chemist and Druggist, they had incurred the penalty under the statute. He then referred to the preamble, and the sections 1, 5, 13, 15 and 26 of the Statute, arguing that they were consistent with each other, and only consistent with the construction of the 13th and 15th sections for which he contended, namely, that having regard to the admission of the defendants that they used the title Chemist and Druggist, the only question for the Court was whether they were upon the register; and then read M'Call's case and Marwood's case, as reported in the March number of the PHARMACEUTICAL JOURNAL, and the opinion of the Attorney-General therein referred to.

The Judge: It is a rule of construction in relation to Acts of Parliament of this kind, that the Court shall advance the remedy intended by the Act. Now I find that this Act has been passed to protect the public in the matter of the sale of poisons; that the preamble says, "It is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as Chemists and Druggists, should possess a competent practical knowledge of their business." I find also, that by section 13, provision is made for a register of the qualified persons, and the Register is made evidence. It is admitted that the defendants use the title Chemist and Druggist, and the Register —published in accordance with the Act—is in my hands, without their names appearing in it. I cannot adopt the view which has been contended for in the interests of the defendants, and I consider that the plaintiffs are entitled to recover the penalty provided by the fifteenth section.

Judgment for the plaintiffs.

Generation of Heat by Fungi.—Dutrochet has observed that there is more heat generated by *Boletus æneus* than by any other vegetable, with the exception of Arum. This phenomenon is, however, by no means confined to *B. æneus*, but is, I believe, common to all Boleti; and when decomposition has set in, the heat evolved is considerable, but even when perfectly young and fresh all the Boleti give out heat. Whilst packing up the three large and beautiful specimens of *B. colopus*, Fr., exhibited by me at the last meeting of the Royal Horticultural Society, I noticed the decided heat evolved from the specimens. At the time of packing, my plants were perfectly fresh and young, and after being placed in a light paper box for a short time, the heat evolved was apparent to the hand. I tested the heat with a thermometer, which stood outside the box in a shaded room at 70°, this after being placed in the box with the Boleti for half an hour rose to 75°. This fine species, though I believe rather rare elsewhere, is common in early autumn in Epping Forest, where it grows in company with another beautiful species, *B. pachypus*, Fr. Both attain here very large dimensions, and the former is extremely beautiful; the tubes are at first brilliant yellow, then orange; the stem deep carmine with a rich maroon base; flesh immediately changing to bright blue when cut or broken.—*W. G. Smith in Gardeners' Chronicle.*

Effects of Godfrey's Cordial.—An inquest has been recenly held, at Nottingham, on a child five months old, who having suffered from diarrhœa, had Godfrey's Cordial administered to it by its mother. The child succumbed and a *post-mortem* examination showed that death had been accelerated by opiates. A verdict in accordance was given and the mother was reprimanded by the coroner for her conduct in administering the "remedy."—*Medical Times and Gazette.*

BOOK RECEIVED.

SNUFF TAKING: its Utility in Preventing Bronchitis, Consumption, etc. By JOHN C. MURRAY, M.D., F.A.S.L. London: Churchill and Sons. Newcastle-on-Tyne: D. H. Wilson.

The following journals have been received:—The 'British Medical Journal,' Aug. 27; the 'Medical Times and Gazette,' Aug. 27; the 'Lancet,' Aug. 27; the 'Medical Press,' Aug 31; 'Nature,' Aug. 25; the 'Chemical News,' August 26; 'Journal of the Society of Arts,' Aug. 26; 'Gardeners' Chronicle,' Aug. 27; the 'English Mechanic,' Aug. 26; the 'Canadian Pharmaceutical Journal' for August; 'Répertoire de Pharmacie' for August; 'Revista Farmacéutica' for June; 'Notes upon Books,' from Messrs. Longman.

We have received from a correspondent the 'Glasgow Daily Herald' for Aug. 18 and 20.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

HOSPITAL DISPENSING.

Sir,—The *Lancet* finds fault with your editorial comments in regard to the above topic. Whilst the *Lancet* takes medical affairs under its especial charge, the PHARMACEUTICAL JOURNAL may surely be allowed to criticize the dispensing arrangements of the hospitals and dispensaries without being accused of a sinister motive. The safety of the poor is as much the interest of the State as that of the rich, and I know of no valid reasons why lotions, liniments, etc., of a deleterious character should not therefore be supplied to out-door patients in "poison" bottles. If it became the rule to do so, the poor are not so ignorant as not to become aware why such bottles are given them, and they would soon learn to keep them for their legitimate use. To provide such bottles the funds of the hospitals are available.

The majority of the members of the Pharmaceutical Society have indeed objected—rightly so, I think—to any interference with the internal arrangement of their pharmacies, believing that the individual pharmacist can best provide for the safety of the public by storing poisons in his own way, and according to the special circumstances he has to deal with. The *Lancet* has forgotten to note the errors of the class which it essays to represent. "Those who live in glass houses should not throw stones." How many medical men—dispensers of their own physic—send out mixtures, lotions, etc., in one description of bottle! Will they consent to submit their surgeries to inspection, or their pharmaceutical knowledge to the test of our examinations? Let me also inquire whether medical men are less liable than chemists and druggists to poison people by mistake? I trow not. Whilst the *Lancet* is advocating penal enactments against those who are assumed to be so presumptuous as to invade the domain of the surgeon and the physician, let the PHARMACEUTICAL JOURNAL draw attention to "unqualified" pharmacists. Their name is legion, and they abound most in that body of which your contemporary is the accredited organ. "A fair field and no favour" is the motto of yours truly,

August 29th, 1870. MINOR ASSOCIATE.

PLASTER-SPREADING.

Sir,—In your issue of August 13th there is a paragraph relating to the fixing of paper margins in plaster-spreading. No doubt the suggestion there made is effectual as regards adhesion, but will it not be open to the objection of leaving a sticky margin liable to discoloration? The plan I have used for some years past is to cut out the margin, in one piece, from brown paper, thoroughly soak it in water, then lay it out flat on the counter, and remove the superfluous moisture with a cloth; the other side, which will be quite wet, is laid on the skin, and firm pressure applied with the cloth. If this be properly managed,—and it requires but little practice,—sufficient adhesion takes place, so that, when the paper is removed, a clean and smooth margin is left, free from stickiness. This method I know to be followed by many dispensers, but still it may be a wrinkle to others.

Liverpool. T. H. HUSTWICK.

PROFESSOR REDWOOD'S ANNUITY.

SIR,—I quite agree with every word of the letter addressed to you by Mr. Halliday. He happened to be a fellow-student of mine at Bloomsbury Square; and, though I do not know whether the students of that session were specially favoured by Dr. Redwood, I believe few of them would object to the vote of the Council as regards his annuity, or fail to regard with surprise the opposition it received at the Council meeting.

I could say a good deal upon this point, but, with your permission, I will simply state that much of the voting upon that occasion by some of the "*new blood*" was entirely at variance with the way I should have voted myself, and is far from the way I expected they would act.

W. Y. BREVITT.

Wolverhampton, August 27th, 1870.

Sir,—Though anonymous letters should be passed over in silence, as productions which the author himself is ashamed of, still, since "Pharmaceutist," in last week's Journal, assumes to award the "thanks of the whole members" (*sic*) of our Society to those gentlemen who so strongly resisted the motion for an annuity to Mr. Redwood, I, for one, desire to be excepted from such company, preferring to range myself on Mr. Halliday's side. I see nothing to be proud of in curtailing the moderate salaries and incomes of those who have spent their best years in teaching us. If some of their pupils claim to be more clever now than their former teachers, this, if true, would only prove that teacher and pupils have both done their duty; in a properly-regulated mind it would produce a sense of gratitude, not a desire for persecution.

J. SCHWEITZER.

86, *King's Road, Brighton, August 27th*, 1870.

HOW TO DRIVE AWAY MOSQUITOES.

Sir,—In the last Journal you have a paragraph headed "How to Drive away Mosquitoes." I was last autumn at Venice in the "mosquito season." The special curtains round the bed quite failed to exclude the blood-thirsty villains, so I went to the "Farmacia Reale," and was supplied with some pastilles to burn. They appear to be composed of coarsely-powdered *Pyrethrum roseum*, made into a mass (with solution of olibanum or other odorous gum), rolled out about half an inch thick, and roughly cut into conical pieces one and a half inch long. The attractive label, "Sonni tranquilli," is not to be withstood by sleepless foreigners. I nearly choked myself by burning three or four at a time inside the mosquito nets, and the only appreciable effect was that the wretches were driven mad, and attacked with insatiable fury. Directly the candles went out they charged through the clouds of incense, and the morning light showed on blistered face and half-closed eyes how little they care for what you euphoniously term "the immemorial and most beautiful rite of burning frankincense." I send you the remnant of a box—possibly, the museum has no specimen of these pastilles. Yours obediently,

WM. MATTHEWS.

12, *Wigmore Street, August 24th*, 1870.

[*** The virtue of mosquito curtains depends upon their being properly arranged, and carefully tucked in all round the bed. Of course if this be done with one or more mosquitoes inside the curtain, the other tenant of the bed is likely to suffer.—ED. PH. J.]

Co-operative Trading.—Our correspondent "Anti-Stores" appears to be under some misconception in regard to the price-list he mentions, which is one advertised by a grocer's firm, not by a co-operative store. The prices quoted are, in some instances, very low, but it seems nevertheless to be a case of fair competition,—always provided that the goods are of proper quality.

Mr. B. M. Johnson informs us, with reference to Professor Tuson's paper on pepsine, that he has once been supplied with pepsate of lead instead of pure pepsine.

M. R. J. (Chipping Sudbury).—Application should be made at Apothecaries' Hall.

A. B. (Hertford).—The question is a legal one. You should consult your own Solicitor, or apply to the Solicitor to the Excise at Somerset House.

James Batham (Manchester).—The formula for Syr. Ferri Phos. c. Quinia et Strychnia (Easton) is given at page 125 of the last edition of Squire's 'Companion to the Pharmacopœia.'

Mr. J. Coles, of Coleshill, has forwarded a copy of the enclosed prescription, in order to elicit through these columns the opinion of the trade as to how he ought to have dispensed it.

℞. Acid. Nit. Mur. ℨij
Inf. Quassiæ ℥xij
℥j ter die.

℞. Podophyllin. gr. xv
Ext. Coloc. Co. gr. xxxvj
ij p. o. n.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

THE SOURCE OF MUSCULAR POWER.

BY BARON LIEBIG.

So far as anything is known of the processes of oxidation that take place at temperatures not exceeding the heat of the body, the conversion of non-nitrogenous substances into carbonic acid and water, as well as the conversion of nitrogenous substances into carbonic acid, ammonia and water, takes place in the same way that urea is formed from uric acid. There are formed products containing less hydrogen and more oxygen, until at last the most highly oxygenated product yields carbonic acid by a further addition of oxygen. Thus alcohol is converted first into aldehyd, then into acetic acid; this again into formic acid, which then yields carbonic acid.

The highly complex nitrogenous compounds always undergo at first a breaking up into products that on the one hand contain a larger amount of nitrogen, while the others are free from nitrogen, or contain a smaller amount of it with a larger amount of carbon. These products are then converted, like uric acid and non-nitrogenous substances, into carbonic acid, ammonia and water.

Urea may be regarded as carbonic acid, in which one equivalent of oxygen is replaced by amidogen, or as ammonia in which the third equivalent of hydrogen is replaced by carbonic oxide.

$$C\left.\begin{matrix}O\\NH_2\end{matrix}\right\} \text{ or } N\left.\begin{matrix}H_2\\CO\end{matrix}\right\}$$

In the animal body oxidation of non-nitrogenous compounds takes place in the presence of alkalies, and in many cases I believe the law of oxidation discovered by Kolbe also obtains. This explains the formation of substances containing little or no oxygen out of others that contain much.*

From what has been said it will be intelligible that muscular power, if its source is in the muscles, does not originate by combustion taking place in the same way as in the furnace of a steam engine; it can only be the result of a material transformation, that is to say, of motion taking place in the interior of the muscles.

A closer consideration of the behaviour of yeast-cells is perhaps calculated to afford a more definite idea of the process that takes place in the living muscle.

Whatever view one may hold in regard to the mode in which the yeast-cell acts upon sugar, it is at least certain that within the yeast-cell there is motion, by means of which it acquires the capability of performing external work, consisting in the breaking up of a carbohydrate and similar compounds. This work, however, is chemical not mechanical, as it would be if a piece of wood were split.

Some notion of the magnitude of the force exerted in the action of yeast may be formed from the fact that a particle of yeast will bring about the conversion of at least sixty times its weight of sugar, or, as I believe, even upwards of a hundred times its weight.

This breaking up of sugar is accompanied by a considerable evolution of heat, and by a mechanical effect. According to Dubrunfaut's direct determination, 1 gram of sugar evolves in fermentation 127 units of heat; in addition to this, the carbonic acid gas disengaged has to overcome the pressure of the atmosphere, thus performing work that must be taken into account as corresponding to 2482 gram-meters for each gram of sugar.

Assuming then that yeast decomposes sixty times its weight of sugar, it follows that if the evolution of heat and the exercise of force be referred to the yeast alone, without regard to the sugar, each gram of yeast is capable of developing $6 \times 127 = 7620$ units of heat, and a mechanical effect equal to 148,960 gram-meters, or very much more than it would produce by combustion, and that is done without the access or co-operation of oxygen.

Supposing a system of pipes and vessels as delicate as the blood-vessels in the muscles, and the walls of those vessels to be forming entirely of yeast-cells, with a stream of sugar solution moving through these vessels, we should then, by the determination of the heat generated and the mechanical action produced, be forced to regard this apparatus as a very enormous source of heat and power.

If we knew no more of sugar and of the behaviour of yeast in fermentation than we know of blood and muscle in the work performed by muscles, we should not be in a position, by the determination of the decrease of weight in the system and of the heat of combustion of the substances that the system consists of, to form any conception of the magnitude of the causes acting in it.

If in place of sugar solution we suppose that a current of beer-wort (which includes conditions for the multiplication of active yeast-cells) flowed through the system of yeast-cells, then the loss of weight undergone by the working cells would be made up for by the production of new cells; the system would increase in mass and circumference, while its action would be proportional to its largest section.

On the presumption that in the alteration undergone by sugar in its passage through the supposed system of cells, we might undoubtedly ascribe the carbonic acid and the heat produced, as well as the mechanical effect (which are indications of an oxidation process) to combustion, then we might compare the process to that taking place under the boiler of a steam-engine, and the parts of such an engine with the apparatus consisting of cells.

However, this representation would be entirely false: the oxygen of the air may take part in the process of fermention, as in the conversion of alcohol into acetic acid, but it is not the determining cause of it; the carbonic acid evolved and the heat developed are not products of combustion.

The cause to which all these actions must be ascribed lies in the mobile cell contents and in the motion to which that is subject.

If we compare the behaviour of a muscle with that of the yeast-cell, we know that a constant metamorphosis or motion is taking place in it, and that this goes on even when the muscle is separated from the body. During this alteration the muscle is capable of performing a certain amount of mechanical work; the internal or molecular motion in the muscle is quite independent of the exterior motion of the mass; it takes place during rest and in the absence of irritation, without the muscle showing any sign of external motion; but the latter is dependent upon the internal motion, and when this has attained a certain magnitude the power of the muscle for performing mechanical work is extinguished.

This behaviour corresponds exactly to that of the yeast-cell; the transformation of its cell contents is quite independent of the sugar.

* Ann. Chem. Pharm. lxx. 318.

The most distinguished physiologists have occupied themselves with measuring the absolute muscular force, and they have found that it is proportionate to the largest section of the muscle.

Even the severed muscle exercises its capability of doing work, though there may be no stream of blood moving through it and conveying oxygen or combustible elements, but without any command from the central organ the potential energy becomes active force; heat is generated and carbonic acid evolved, together with certain other products, by the accumulation of which, in the interior of the muscle, it becomes tired. The simple removal of those products, by injecting a weak solution of salt, again sets up the capability of doing work for some time.

The difference in the behaviour of a muscle in the living body from that of one severed from it is, that the capability of performing work continues in the living organism, while it is speedily exhausted in the muscle that has been severed from the body.

However, the explanation of the continuance of the capability to perform work is not the first but the second question that has to be considered here.

The duration of this state depends upon the circumstance that the muscle is always being restored to its original condition, while the products that interfere with its working capability are incessantly removed from it; still a muscle remains for a time capable of performing work in the absence of all conditions for its nutrition.

A frog's heart, entirely freed from blood by injecting a weak solution of salt, will continue to work for twelve hours and more just as in the living body. In this condition we can scarcely compare it with anything else than a bent spring that gives out in motion the force it has acquired by its tension. The mechanical tension depends upon an altered position of the ultimate particles of the spring; the motion ceases when those parts have been again restored to their original position. In a manner quite similar, we see that with the mechanical effects produced by a muscle there is an alteration in the arrangement of its particles, and in the absence of all other causes that determine performance of work, it is impossible to avoid the opinion that the motion of these particles is the source of muscular power just in the same way that the change in the condition of the contents of the yeast-cell is the cause of the breaking up of sugar in fermentation.

It is known to physiologists that all the blood may be removed from a frog by injecting a weak solution of salt, and that the animal will nevertheless move, jump and breathe like a living frog for hours. In reality the animal does not, in this case, behave differently from its leg after separation from the body, though the phenomenon is one that must astonish any one who is not a physiologist.*

* I recently received a letter from my friend Professor O. N. Rood, of New York, in which he communicated to me the following case: Professor Agassiz has been occupied for some time in catching sharks for the purpose of studying their anatomical structure, and on one occasion a shark that had been hooked struggled in the usual violent manner before it was landed; but on dissection the animal proved to be almost entirely destitute of blood. Closer examination showed that it had been attacked by a parasite, and the gills were in some places eaten through, so that nearly all the animal's blood had been extracted, and its place taken by sea-water. Agassiz mentioned this fact in order to show that the shark may retain its power undiminished for some long time after having lost nearly all its blood.

It is indeed scarcely possible to do otherwise than think that the force of the most complex constituents of plants and animals, manifesting itself in motion, rests in their composition; and that this force comes into action in a definite direction in consequence of the physiological arrangement of those constituents, —or, in other words, their conformation in the organs of the living body, which are built up of these materials.

In order to understand this, it is only necessary to remember that the yeast-cell, in causing fermentation, loses a part of its nitrogenous constituent, which does not in itself possess the power of causing fermentation, though it acquires that power when it has served for the construction of a new cell, and has regained its original arrangement.

It is not easy to form any conception as to whether, and in what way, heat may be concerned in the performance of work by muscles; the difficulties in this respect will, perhaps, be less when we are better acquainted with the substances by the metamorphosis of which muscular work is done.

The unaltered composition of syntonin and albumen in muscle appears to prove that there is no breaking up of them in the muscle, and consequently we must assume that it is by substances of very much higher tension that the performance of work by muscles is brought about. It may be that these are products which originate from albumen by the action of oxygen, taking up heat in their formation, as is the case in the formation of chloride of nitrogen. The fact ascertained by Pettenkofer and Voit, that, in a state of rest, there is an accumulation of oxygen in the body without any corresponding formation of carbonic acid, may perhaps be taken into account in regard to this point.

It is conceivable that, in the breaking up of these substances, the heat taken up or rendered latent may be converted into its mechanical equivalent; in this case the performance of work must be preceded, or at least accompanied, by a development of heat by oxidation, possibly of non-nitrogenous substances.

The existence of such compounds in muscle is perhaps indicated by the fact that Frankland was not able to determine the heat of combustion of creatin, because it always exploded violently in the tubes, just as some cyanogen compounds do when they are burnt with nitre or chlorate of potash. As regards cyanogen, we know that in its formation there is a very considerable amount of heat absorbed. However, it must not be supposed that there is yet any ground for saying whether, or in what manner, creatin may be concerned in the production of muscular force.

Helmholtz's observation that there is a sensible rise of temperature in the working muscle separated from the living body, may perhaps lead to a solution of this problem when the collateral conditions of the rise of temperature shall have been more accurately ascertained.

The most difficult thing, which may perhaps never be explained, is the influence of the nerves upon muscular work. A muscle, as an apparatus for performing work, evidently behaves in a manner similar to the apparatus for producing electricity in electric fish.

In these animals electricity is produced by a metamorphosis in the small voltaic couples, and a certain store appears always to be maintained, which is, in the state of rest, distributed in the apparatus for the production of the force, or is applicable for other purposes in the animal; the force is not generated at the moment of its application.

It is evidently dependent upon the will of the animal, determined by the nerves, to bring about such an arrangement in the parts of its electrical apparatus that the distributed free electricity may be collected and applied in giving shocks. Frequent discharges fatigue the animal, and rest as well as food are requisite in order to renew the accumulation of electricity.

The nerves in the muscular apparatus appear to act in a similar manner; under their influence the metamorphosis which is constantly going on receives a special direction in such a manner that the existing molecular motion is converted into a motion of mass.

Any more detailed explanation of the processes taking place in muscles by which contraction is determined, and upon which their capability of performing work depends, would have to be regarded as hazardous in the present state of our knowledge.

The only points in regard to which we are no longer in doubt are that the muscular force is not produced like the motive power in a steam-engine, and that the simple assumption of its being produced by combustion of non-nitrogenous or nitrogenous substances in muscle leaves us without any help in regard to this obscure subject; it is a mere formula without meaning which perplexes more than it asserts.

When a constituent of a muscle produces a mechanical effect, it must undergo chemical alteration from its soluble and mobile constituents; there must be other compounds formed gradually, and this must continue so long as the muscle is capable of performing work. Subsequent more exact investigation will render this more intelligible; and for the present it may be said with certainty that among the products thus formed urea is not one, for it is not to be detected either in the living muscle or in muscle that has been separated from the body.

Hence it necessarily follows that muscular work and the production of urea do not bear any direct relation to each other, consequently the work performed during a certain time cannot be measured by the quantity of urea secreted during that time.

The astonishing observations of Dr. Parkes* do not, as I believe, admit of any doubt in regard to this point. I regard them as the basis of the true law by which we have to judge as to the metamorphosis of muscle in the animal body.

These experiments were made upon two healthy soldiers (S. and B.) of dissimilar bodily weight. During sixteen days they consumed in their food equal quantities of nitrogen. Their food consisted of bread, meat, vegetables, etc., in such proportions that their bodily weight was maintained almost constant. The experiments were divided into five periods. During the first period both men did their usual work; during the second they remained for the most part at rest and in bed; during the third period they did their ordinary work; during the fourth period they were put to severe exertion, on the first day making a march of twenty-four English miles over level ground, and on the second day a march of thirty-five miles; during the fifth period they did their usual work. The quantities of urea secreted during these five periods were as follows:—

		Grams.
I. *Ordinary Work.*		
Mean of 4 days.	S. . . .	36·374
,,	B. . . .	37·134
II. *Rest.*		
Mean of 2 days.	S. . . .	38·348
,,	B. . . .	39·100
III. *Ordinary Work.*		
Mean of 4 days.	S. . . .	36·223
,,	B. . . .	37·534
IV. *Severe Exertion.*		
Mean of 2 days.	S. . . .	38·643
,,	B. . . .	40·328
V. *Ordinary Work.*		
Mean of 4 days.	S. . . .	40·811
,,	B. . . .	38·909

These results seem to me to demonstrate unmistakably that the nitrogenous compounds eliminated during muscular exertion are ultimately excreted as urea, and that this does not take place completely at the time the work is done, but at a later period.

During the second period the quantity of urea excreted by both individuals while at rest was increased; during the third period it was the same as in the first period; it increased considerably during both of the days of marching; while in the fifth period of ordinary work it was always higher than during the first and third periods.

Conformably with these results the bodily weight decreased during the second period, while it increased during the third period, again decreased most considerably during the fourth period, and was restored to its original state during the fifth period.

Dr. Parke's memoir on the excretion of nitrogen during rest and work with non-nitrogenous diet also contains a large number of remarkable results, which cannot be discussed here with one exception.

The loss of weight suffered by both individuals during a long march was very considerable, both with ordinary diet and with non-nitrogenous diet.

In the case of S. the loss of weight during this period amounted to 5 pounds and 4 pounds; in the case of B. it was $4\frac{3}{4}$ and $1\frac{1}{2}$ pound. The reason for this loss of weight cannot be doubtful. Both individuals may have lost fat by a greater consumption of oxygen during the severe work; but the greater part of the loss was undoubtedly water; not, indeed, liquid water that could be replaced by drinking, but water that was combined in the muscles and tissues, and had been set free in consequence of the metamorphosis or consumption of muscular substance; the slow restoration of the bodily weight and the necessary co-operation of the food prove that the tissues, which in their natural condition had retained the water eliminated, were altered in their character; four days elapsed in the case of S. and B. before they had again acquired their original weight.

The animal organism has frequently been compared to a railway locomotive in which, by the joint action of air, water and fuel, heat and power are produced. In reality air, water and food, which may in a certain sense be regarded as fuel, are necessary conditions for the production of heat and

* 'Proceedings of the Royal Society,' No. 94. 1867.

power in the animal body also, but they serve for other purposes as well.

The iron and copper of which the parts of the locomotive mechanism consist are not supplied by the fuel, and for the production as well as the maintenance of those parts an external force is consumed on the work of many artisans.

The difference between the animal machine and the locomotive consists in the circumstance that food is requisite not only for maintaining its temperature and producing force, but also for providing the material for the maintenance of its working parts, or building up its organs; even this does not take place with expenditure of force. For the construction of these organs in the proper form and character for performing the work belonging to them, there is required a certain amount of force as in the working up of the copper and iron in the locomotive, though in a different way; but for the production of this working force a certain quantity of material must be consumed.

Moreover, the arrangement of the animal machine is such that its own parts and constituents serve to supply at their own cost its requirements in heat and power, even when food is entirely withheld.

Of the total quantity of force capable of being generated in the animal body, a portion is applied in performing interior work, comprising

a. All involuntary motions of the blood and of respiration, etc.

b. For working up the food into those substances which serve for the construction and restoration of organs, especially the parts of the body.

And it is only the portion remaining after these operations have been performed that is available for the performance of external work.

(*To be continued.*)

MEDICINAL FERNS.

BY M. C. COOKE, M.A.

Ceterach officinarum, *Willd.* "Rusty Spleenwort." Is still employed in Tunis and other parts of North Africa, as well as in Turkey. It was the Cetherak of the Persians. At one time it was strongly recommended in this country in jaundice and diseases of the spleen.

Cibotium Barometz, *Sw.* Yields the "Penawar Jambie" of Sumatra. It is a similar substance to "Pulu" and employed for like purposes. This is the Scythian Lamb of old writers, of which such marvellous stories were told.

Cibotium glaucum, *Hook. et Arn.*; C. Chamissoi, *Kaulf.*; C. Menziesii, *Hook.* "Pulu." All these, if really distinct, are natives of the Sandwich Islands, and yield the substance called "Pulu," which is the silky hair found clothing the rhizome and lower portion of the stalk or stipes. It has been recommended as a styptic. For further particulars, consult 'Pharmaceutical Journal,' Series 2, Vol. I. p. 501.

Davallia tenuifolia, *Sw.* In the Mauritius this forms the basis of the compound remedies used by empirics for tambave, and is often administered internally in decoction without any admixture, and also in the form of a lotion and bath.

Helminthostachys dulcis, *Kaulf.* This fern, Dr. Lindley states, is regarded in the Moluccas as a slight aperient; it is used as a pot-herb, and its young shoots as asparagus.

Lastrea athamantica, *Moore.* Found growing on grassy hills and in moist places near Port Natal. The Zoolu Kafirs, writes Dr. Pappe, who know it by the name of "Uncomocomo," use it as a vermifuge; and its caudex, given in the form of powder, infusion or electuary, has been proved to be excellent in helminthiasis and especially in the cure of the tapeworm.

Mohria thurifraga, *Sw.* Grows abundantly on the Cape mountains, Cape of Good Hope. When bruised it smells of olibanum. In some parts of the colony, Dr. Pappe states that the dry leaves are pulverized and made with fat into an ointment, which is cooling and very serviceable in burns and scalds. The vernacular name is "Brand-boschjes."

Nephrodium Filix-mas, *Rich.* "Male-fern." This is one of the few ferns which continue to maintain their character and position for their remedial properties. The rhizome of the Male-fern has risen rather than fallen in estimation as an anthelmintic, and as such finds a place in pharmacopœias and in regular practice.

Nothochlæna piloselloides, *Kaulf.* Has been employed in India to subdue sponginess in the gums, according to Dr. Lindley; but whether still in use we have no evidence.

Ophioglossum ovatum, *Sw.* This fern, in the Mauritius, enters into the composition of a popular remedy given in tambave.

Ophioglossum vulgatum, *Linn.* "Adder's-tongue." "The leaves of adder's-tongue," writes Gerarde, "stamped in a stone mortar, and boiled in oyle olive unto the consumption of the juice, and untill the herbes be dry and parched, and then strained, will yield a most excellent greene oyle, or rather a balsame for greene wounds, comparable to oile of St. John's wort, if it do not farre surpasse it by many degrees; whose beauty is such that very many artists have thought the same to be mixed with verdigrease.

> "For them that are with newts or snakes or adders stung,
> He seeking out an herb that's called adder's-tongue,
> As nature it ordain'd its own like hurt to cure,
> And sportive did herself to niceties inure."

Osmunda regalis, *Linn.* "Royal Fern." A native of Europe. The rhizome was formerly employed medicinally, but seems to be of little or no value. It is affirmed to be tonic and styptic, and to have been serviceable in cases of rachitis.

Polypodium Calaguala, *Ruiz.* According to Ruiz, the rhizome of this species constitutes, in Peru, the "Genuine Calaguala," or "Ccallahuala," or "Slender Calaguala." It is said to possess deobstruent, sudorific, diuretic, anti-venereal and febrifuge virtues, and is frequently used to thin the blood, promote perspiration, and to mitigate rheumatic and venereal pains.

Polypodium crassifolium, *Linn.* The rhizome of this species is called "Thick Calaguala," "Puntupuntu," or "Deer's-tongue." It is employed in Peru in the same manner, and for the same purposes, as the "Genuine Calaguala."

Polypodium phymatodes, *Linn.* This is the "Male-fern," or "Fougère mâle" of the Mauritius. A decoction of the stems is used as an aperient and refrigerant. Mixed with barley and milk, it forms a beverage often recommended by doctors after inflammatory diseases.

POLYPODIUM VULGARE, *Linn.* "Common Polypody." This common European fern was at one time in high repute. A decoction of the fronds was formerly administered to children for worms, cold and whooping-cough. The ancients attributed many virtues to this plant,—Dioscorides, for limbs out of joint and chaps between the fingers; Pliny, for chaps on the toes; and others to purge melancholy. It is the "rheum-purging Polypody" of Shakspere.

PTERIS AQUILINA, *Linn.* "Common Bracken." Native of Europe. The rhizome is said to be astringent and anthelmintic. Lindley says that it has been used with some success as a substitute for hops. Its esculent qualities must be very poor, although it is said to be sometimes eaten. The ancients used rhizomes and fronds, in decoction, in chronic disorders arising from obstructions of the viscera and spleen. It is sometimes employed abroad in dressing and preparing kid and chamois leather.

SCOLOPENDRIUM VULGARE, *Sm.* "Hart's-tongue." Old herbalists seem to have had great faith in this fern. Lightfoot says that in Scotland it was used by the country people for burns and scalds; and Ray writes of it as applied in the form of ointment to wounds and ulcers. In France it is employed as an astringent in diarrhœa and hæmorrhage.

UNDETERMINED INDIAN FERNS. Several fern products employed in India have been enumerated, but at present without accurate identification. Amongst these are "Iskoolikundrion," a species of *Scolopendrium;* "Doonditarus," a species of *Dryopteris;* "Surkhus" or "Bitarus," probably a species of *Pteris;* and "Bisfaij" or "Bulookunboon," which is referred to a species of *Polypodium.*"

NEW ALKALOIDS OF OPIUM.

BY O. HESSE.

The author has succeeded in extracting from opium several new alkaloids. When an aqueous infusion of opium is precipitated by caustic soda or limewater in excess, there remains in solution a substance which may be separated by ether. This substance gives with dilute sulphuric acid a purple colour like rheadine. The coloration was observed formerly by Merck, but he did not isolate the substance; what he described under the name of porphyroxine being, according to the author, a mixture of several alkaloids which he has now separated by the following method.

The alkaline liquor is shaken with ether, and after acidulating the etherial solution with acetic acid, the ether is evaporated off. What remains is mixed with a dilute alkaline solution gradually and stirred meanwhile, so that the resin which separates may clot together. If this operation is properly conducted the alkaloids remain in solution.

After twenty-four hours the precipitate is separated, the liquid mixed with slight excess of hydrochloric acid, and then with ammonia, which precipitates the bases. The whole is then shaken with chloroform, the solution, thus obtained, acidulated with acetic acid, the chloroform driven off and the residue neutralized with ammonia. This throws down a resinous reddish-coloured precipitate which becomes crystalline and consists of impure lanthopine. After twenty-four hours the filtered liquid is mixed with caustic soda, very little more than sufficient to decompose the ammonia salts present; it is then shaken with ether several times to separate the codeia that renders it turbid. This alkaloid is dissolved by ether more readily than the other bases—meconidine, codamine, laudanine, and another which the author designates *x*. Ether does not extract these latter from the solution containing fixed alkali until after chloride of ammonium has been mixed with it.

When the etherial solution of these bases is allowed to evaporate very slowly, laudanine crystallizes first, the other three bases remaining as an almost amorphous residue after the ether has evaporated. But if, before the ether has evaporated off entirely, the mother liquor be mixed with solution of bicarbonate of soda, crystals of codamine are deposited on further evaporation of the ether.

The mother liquor from which codamine has separated is then mixed with acetic acid and with chloride of sodium, which precipitates chlorhydrate of meconidine, while the base *x* remains in solution. The latter is entirely separated from meconidine by repeatedly dissolving the hydrochlorate in water, shaking with bicarbonate of soda and ether, and then evaporating the etherial solution.

Meconidine, as left on evaporation of an etherial solution, is in the form of a yellowish varnish. It melts at 58° C., cannot be sublimed, dissolves in alcohol, ether, benzol, chloroform and acetone. It blues litmus paper, is destitute of taste, but its salts are bitter.

A solution of a salt of meconidine gives with potash a flocculent precipitate soluble in excess of the precipitant. The solvents of meconidine do not extract it from this solution. A large excess of ammonia or of lime will also dissolve meconidine; but ether will separate it from these solutions. Strong acids decompose meconidine, especially with the aid of heat, producing a rose coloration that afterwards becomes purple. Acetic acid alters meconidine only when boiled with it, and then only partially. Concentrated sulphuric acid dissolves it with olive-green coloration.

Meconidine is distinguishable from rheadine by its solubility in potash and by its composition, $C_{21}H_{23}NO_4$, while rheadine is $C_{21}H_{25}NO_6$.

The salts of meconidine are very instable, the hydrochlorate and the hydriodate are amorphous, soluble in water and in alcohol. The chloraurate is a dirty yellow amorphous precipitate. The chloromercurate, white and amorphous; hydrochloric acid gives it a rose colour. The chloroplatinate $(C_{21}H_{23}NO_4HCl)2PtCl_4$ is an amorphous yellow precipitate.

Laudanine.—This base, crystallized from boiling dilute alcohol, forms colourless hexagonal prisms. It dissolves in benzol, chloroform and in boiling alcohol; cold alcohol dissolves only $\frac{1}{540}$th. It has an alkaline reaction.

The salts of laudanine are bitter. Potash and ammonia throw down from solutions a white precipitate soluble in excess of alkali. Chloroform extracts the base readily from its ammoniacal solution. Protochloride of iron colours the salts green, and dissolves them. Oil of vitriol dissolves them with an orange coloration, nitric acid with a rose colour, which becomes dark violet when heat is applied.

Laudanine has the formula $C_{20}H_{25}NO_3$; it melts at 163° C., and does not sublime.

The hydrochlorate forms colourless prisms soluble in water and in alcohol.

The chloroplatinate is a yellow amorphous precipitate slightly soluble in boiling water. The chloromercurate is a white precipitate soluble in boiling water. The hydriodate is very soluble and crystallizable. The iodomercurate is a white amorphous precipitate, melting in boiling water and soluble; it is very soluble in alcohol. The sulphate crystallizes in needles; the oxalate also crystallizes, but is sparingly soluble in cold water.

Codamine, $C_{19}H_{23}NO_3$.—This base is purified by converting it into sulphate, decolorizing with charcoal and shaking with ether after addition of ammonia. The base crystallizes from ether or alcohol in hexagonal prisms terminated by pyramids. It is slightly soluble in water, more so in chloroform and in benzol. Its solutions are alkaline and destitute of taste. Generally the salts are amorphous and bitter. The base melts at 121° C., then it decomposes, giving a beautiful crystalline sublimate.

Concentrated sulphuric acid produces a green coloration with codamine, nitric acid gives a bluish-green that becomes violet when heat is applied. Alkalies precipitate the base and an excess dissolves it; bicarbonate of soda also precipitates it in the form of white flocks, which aggregate into a resinous mass.

Lanthopine, $C_{23}H_{25}NO_4$.—This base is purified by treating the hydrochlorate solution with charcoal, precipitating the hydrochlorate with chlorate of sodium, decomposing that salt with ammonia and crystallizing from chloroform. The base then appears as a white powder, consisting of microscopic prisms scarcely soluble in alcohol and very slightly soluble in benzol or in ether. It has no taste nor any alkaline reaction. It dissolves only in a large excess of acetic acid. It is precipitated from its solutions by potash and dissolved by excess of potash. On the addition of chloride of ammonium to this solution the base is separated. This base gives no colour with chloride of iron, differing in this respect from morphia. Concentrated nitric acid transforms it into a red resin; sulphuric acid gives a violet coloration. Heated to 190° C. the base becomes brown; it melts at 200°.

The hydrochlorate of lanthopine $C_{23}H_{25}NO_4HCl + 6H_2O$ forms a gelatinous mass composed of very small crystals, which aggregate together in drying to a horny mass that swells up in water and finally dissolves. Boiling water dissolves the salt, setting free part of the base. The chloroplatinate forms a yellow crystalline powder insoluble in alcohol; it contains one equivalent of water. The hydriodate is gelatinous and soluble. The iodomercurate is soluble in boiling water and in alcohol. The sulphate forms very slender needles.

Thebaine.—This base, discovered by Thibouméry, is contained in the precipitate I obtained in the manner described at the commencement of this article. That precipitate is dissolved by acetic acid, the solution decolorized with charcoal and then mixed with powdered tartaric acid; after twenty-four hours the crystals of tartrate of thebaine that have formed are collected and recrystallized from boiling water. Then the base is set free and crystallized from alcohol. Pure thebaine has no taste; it melts at 193° C.

The acid tartrate forms slender prisms soluble in boiling water and boiling alcohol. The salt requires 130 parts of water at 20° C. for solution. The neutral salt is readily soluble in water and alcohol; it may be prepared by using excess of the base, and then separating it with ether.

The hydrochlorate requires 15·8 parts of water at 10° C. for solution; it is anhydrous at 100° C.

Thebenine.—This base is formed by an isomeric transformation of thebaine under the influence of boiling hydrochloric acid. A solution of 10 parts thebaine in 200 parts of hydrochloric acid (1·04 sp. gr.) is heated to boiling, and then diluted with an equal volume of water. Gradually crystals separate; these are washed with cold water, and redissolved in boiling water mixed with acetic acid; on cooling this solution fine crystals of hydrochlorate of thebenine separate as colourless laminæ that are soluble in boiling water or boiling alcohol, and in 100 parts of cold water. Nitric acid dissolves these crystals with a yellow coloration and evolution of nitrous fumes; the solution mixed with water gives a yellow amorphous precipitate soluble in ammonia. The hydrochlorate of thebenine $C_{19}H_{21}NO_3HCl+3H_2O$ is bitter, but does not appear to be poisonous, while thebaine is extremely poisonous. The chloroplatinate is amorphous and yellow. The chloromercurate forms long colourless prisms. Sulphate of thebenine separates on adding sulphuric acid to a solution of hydrochlorate as a white crystalline powder, but slightly soluble in boiling water, insoluble in cold water or alcohol. It is anhydrous at 100° C.

Thebenine itself is amorphous, insoluble in ether or benzol, slightly soluble in boiling alcohol. It is insoluble in ammonia, but soluble in potash. It absorbs oxygen rapidly, and the potassic solution soon becomes brown in contact with atmospheric air. Sulphuric acid colours thebenine blue, while thebaine gives a dark red colour with the acid.

Thebaicine.—This is probably a second isomer of thebaine, formed by the action of strong acids and heat. Ammonia gives, after this treatment of thebaine, an amorphous yellow basic precipitate, insoluble in ether, benzol, water or ammonia, slightly soluble in boiling alcohol, from which, however, it does not crystallize. Potash dissolves it, and the solution turns brown in contact with air. It dissolves with red colour in nitric acid, and with a blue colour in oil of vitriol. The sulphate is resinous, as well as the hydrochlorate.

The first precipitate contains also papaverine, and this base is present in the mother liquor from which tartrate of thebaine has separated. It is precipitated with ammonia and treated with a little alcohol, which renders it crystalline and dissolves an amorphous base. It is then converted into oxalate, which is crystallized from boiling water. The base may be considered pure if it dissolves without coloration in oil of vitriol. Papaverine crystallizes in colourless prisms, soluble in 258 parts of cold ether; it crystallizes from benzol and melts at 147° C. It dissolves in acetic acid without neutralizing it; potash and ammonia separate it from this solution as a resinous mass that gradually becomes crystalline, but is insoluble in excess of the alkali. Nitric, sulphuric or hydrochloric acid, added to the acetic solution, separate the corresponding salts in a crystalline form.

The author assigns to papaverine the formula $C_{21}H_{21}NO_4$, instead of $C_{20}H_{21}NO_4$ adopted by Merck and Anderson. This formula is confirmed by the analysis of the hydrochlorate and of the chloroplatinate. The former dissolves in 37 parts of water at 18° C., and the latter is a dark yellow crystalline precipitate. The chloromercurate forms colourless rhomboidal laminæ. The iodomercurate is crystalline and soluble in boiling alcohol.

The author concludes his memoir by stating the relations which the new bases bear to those previously known. The new bases exist in very small amounts in opium. A sample containing 8·3 per cent. of morphia gave 0·0058 per cent. of laudanine, the same quantity of lanthopine, and 0·0033 of codamine.

Codamine and laudanine are homologues of morphia and of codeia. Lanthopine is the superior homologue of papaverine. Related to the latter two, as oxidation derivatives, are cryptopine and narceine on the one hand, rheadine and rheagine on the other.

It has been stated incorrectly that cryptopine is soluble in potash. Oil of vitriol colours cryptopine dark green.—*Annalen der Chem. und Pharmacie,* cliii. 47.

WHAT IS ENERGY?

BY BALFOUR STEWART.

II.

In our first article it was shown that energy, or the power of doing work, is of two kinds, namely, energy due to actual motion, and that due to position. We ended by supposing that a stone shot vertically upwards had been caught at the summit of its flight and lodged on the top of a house; and this gave rise to the question, What has become of the energy of the stone? To answer this we must learn to regard energy, not as a *quality*, but rather as a *thing*.

The chemist has always taught us to regard quantity or mass of matter as unchangeable, so that amid the many bewildering transformations of form and quality which take place in the chemical world, we can always consult our balance with a certainty that *it* will not play us false. But now the physical philosopher steps in and tells us that energy is quite as unchangeable as mass, and that the conservation of both is equally complete. There is, however, this difference between the two things—the same particle of matter will always retain the same mass, but it will not always retain the same energy. As a whole, energy is invariable, but it is always shifting about from particle to particle, and it is hence more difficult to grasp the conception of an invariability of energy than of an invariability of mass. For instance, the mass of our luminary always remains the same, but its energy is always getting less.

And now to return to our question, What has become of the energy of the stone? Has this disappeared? Far from it; the energy with which the stone began its flight has no more disappeared from the universe of energy than the coal, when we have burned it in our fire, disappears from the universe of matter. But this has taken place:—the energy has changed its form and become spent or has disappeared as energy of actual motion, in gaining for the stone a position of advantage with regard to the force of gravity.

If we study this particular instance more minutely, we shall see that during the upward flight of the stone its energy of actual motion becomes gradually changed into energy of position, while the reverse will take place during its downward flight, if we now suppose it dislodged from the top of the house. In this latter case the energy of position with which it begins its downward flight is gradually reconverted into energy of actual motion, until at last, when the stone reaches the ground, it has the same amount of velocity, and, therefore, of actual energy, which it had at first.

Let us now revert, for a moment, to the definition of energy, which means the power of doing work, and we shall see at once how we may gauge numerically the quantity of energy which the stone possesses, and, in order to simplify matters, let us suppose that this stone weighs exactly one pound. If, therefore, it has velocity enough to carry it up one foot, it may be said to have energy enough to do one unit of work, inasmuch as we have defined 1 pound raised 1 foot high to be one unit of work; and in like manner if it has velocity sufficient to carry it 16 feet high, it may be said to have an energy equivalent to 16 units of work or foot-pounds as those units are sometimes called. Now, if the stone be discharged upwards with an initial velocity of 32 feet per second, it will rise 16 feet high, and it has, therefore, an energy represented by 16. But if its initial velocity be 64 feet per second, it will rise 64 feet high before it turns, and will, therefore, have energy represented by 64. Hence we see that by doubling the velocity the energy is quadrupled, and we might show that by tripling the velocity the energy is increased nine times. This is expressed in general terms by saying that the energy or quantity of work which a moving body can accomplish varies as the square of its velocity. This fact is well known to artillerymen, for a ball with a double velocity will penetrate much more than twice as far into an obstacle opposing its progress.

Let us now take the stone or pound-weight having an initial velocity of 64 feet per second, and consider the state of things at the precise moment when it is 48 feet high. It will at that moment have an actual velocity of 32 feet per second, which, as we have seen, will represent 16 units of work. But it started from the ground with 64 units of work in it: what therefore has become of the difference—or 48 units? Evidently it has disappeared as actual energy; but the stone, being 48 feet high, has an energy of position represented by 48 units; so that at this precise moment of its flight its actual energy (16), *plus* its energy of position (48), are together equal to the whole energy with which it started (64).

Here, then, we have no annihilation of energy, but merely the transformation of it from actual energy into that implied by position; nor have we any creation of energy when the stone is on its downward flight, but merely the retransformation of the energy of position into the original form of actual energy.

We shall presently discuss what becomes of this actual energy after the stone has struck the ground; but, in the meantime, we would repeat our remark how intimate is the analogy between the physical and the social world. In both cases we have actual energy and energy of position, the only difference being that in the social world it is impossible to measure energy with exactness, while in the mechanical world we can gauge it with the utmost precision.

Proteus-like, this element energy is always changing its form; and hence arises the extreme difficulty of the subject, for we cannot easily retain a sufficient grasp of the ever-changing element to argue experimentally regarding it. All the varieties of physical energy may, however, be embraced under the two heads already mentioned, namely, energy of actual motion and of position. We have chosen the force of gravity, acting upon a stone shot up into the air, as our example; but there are other forces besides gravity. Thus, a watch newly wound up is in a condition of visible advantage with respect to the force of the mainspring; and as it continues to go it gradually loses this energy of position, converting it into energy of motion. A cross-bow bent is likewise in a position of advantage with respect to the spring of the bow; and when its bolt is discharged, this energy of position is converted into that of motion. Thus again, a meteor, a railway train, a mountain torrent, the wind, all represent energy of actual visible motion; while a head of water may be classed along with a stone at the top of a house as representing energy of position. The list which represents visible energy of motion and of position might be extended indefinitely; but we must remember that there are also invisible molecular motions, which do not the less exist because they are invisible.

One of the best known of these molecular energies is *radiant light and heat*,—a species which can traverse space with the enormous velocity of 186,000 miles a second.

Although itself eminently silent and gentle in its action, it is, nevertheless, the parent of most of the work which is done in the world, as we shall presently see when we proceed to another division of our subject. In the meantime we may state that radiant light and heat are supposed to consist of a certain undulatory motion traversing an ethereal medium which pervades all space.

Now, when this radiant energy falls upon a substance, part of it is absorbed, and in the process of absorption is converted into *ordinary heat*. The undulatory motion which had previously traversed the thin ether of space has now become linked with gross palpable matter, and manifests itself in a motion which it produces in the particles of this matter. The violence of this rotatory or vortex-like motion will thus form a measure of the heat which the matter contains.

Another species of molecular energy consists of *electricity in motion*. When an electric current is moving along a wire, we have therein the progress of a power moving like light with enormous velocity, and, like light, silent in its operation. Silent, we say, if it meets with no resistance, but exceedingly formidable if it be opposed; for the awe-inspiring flash is not so much the electricity itself as the visible punishment which it has inflicted on the air for daring to impede its progress. Had there been a set of stout wires between the thunder-cloud and the earth, the fluid would have passed into the ground without disturbance.

The molecular energies which we have now described may be imagined to represent motion of some sort not perceived by the outward eye, but present nevertheless to the eye of the understanding, they may, therefore, be compared to the energy of a body in visible motion, or actual energy as we have termed it.

But we have also molecular energies which are more analogous to the energy of position of a stone at the top of a cliff.

For instance, two bodies near one another may be endowed with a species of energy of position due to *opposite electrical states*, in which case they have a tendency to rush together, just as a stone at the top of a cliff has a tendency to rush to the earth. If the two bodies be allowed to rush together, this energy of position will be converted into that of visible motion, just as when the stone is allowed to drop from the cliff its energy of position is converted into that of visible motion.

There is finally a species of molecular energy caused by *chemical separation*. When we carry a stone to the top of a cliff, we violently separate two bodies that attract one another, and these two bodies are the earth and the stone. In like manner when we decompose carbonic acid gas into its constituents, we violently separate two bodies that attract one another, and these are carbon and oxygen. When, therefore, we have obtained in a separate state two bodies, the atoms of which are prepared to rush together and combine with one another, we have at the same time obtained a kind of energy of molecular position analogous on the small scale to the energy of a stone resting upon the top of a house or on the edge of a cliff on the large or cosmical scale.

(*To be continued.*)

GINSENG.

BY JOHN R. JACKSON.

Amongst the most extraordinary medicinal plants which have from time to time been celebrated in different ages and countries, the Ginseng of the Chinese is one of the most curious. This drug is the dried root of *Panax Schinseng*,' Nees, a small plant, frequently with a creeping underground stem or rhizome. It is a native of China, and so highly is it esteemed that it forms a large article of internal commerce and realizes almost fabulous prices. As much as 300 taels of silver, which is equal to about £100 of our money, is about the average price of a single tael (640 grains) of the drug. Though it has been proved by our own chemists to possess no medicinal virtues, other than being mucilaginous, aromatic, slightly bitter and saccharine, it is nevertheless esteemed as a most invaluable root by the Chinese, who believe it produces the most extraordinary effects upon the human system, invigorating and restoring the fatigued and wearied body to a marvellous degree, and bringing back youth to the aged and strength to the weak. Be this as it may, it has held its position with the Chinese for a very long time, and still continues to be highly prized. In the year 1709 we read that a body of Tartars, numbering some 10,000, were sent by the Emperor of China in quest of the root, with instructions to bring home as much as they could find, two pounds of the best of which was to be given by each man to the Emperor, and the remainder they were to sell for the same weight of fine silver. The Chinese name, Jinsang or Ginseng, implies "Wonder of the World," and the generic name Panax is derived from the Greek panakes or panacea, a cure for all diseases. Both words, therefore, refer to its supposed extraordinary powers. The Ginseng plant grows in the mountainous parts of China, but the best quality, or that which is most esteemed by the Chinese, is obtained from the Corea; Manchuria also produces a good variety. A species of Panax named *quinquefolia*, growing in North America, has roots similar to those of the true Chinese Ginseng, with which plant indeed it is often confused. These roots are, however, on comparison, more slender than those of *P. Schinseng*. The Americans at one time exported them to China in large quantities as a substitute for the Chinese drug.

The Commissioner of Customs of Newchang has sent home some very interesting remarks on the trade and cultivation of Ginseng, which remarks will no doubt be worth giving in his own words; he says:—

"It is difficult in discussing the trade of the chief port in Manchuria to avoid noticing the strange root in which every native in China, from the Emperor to the humblest coolie, places such implicit faith. Fine Manchurian Ginseng is only found in the upper valley of the Usuri, where ruined towns and forts mark the cradle of the race which seven centuries ago ruled over China from the Yellow River to the Great Wall, which was forced back by the valour and genius of Genghis, and which 400 years afterwards again swept into China to occupy and retain the Imperial throne. But Ginseng loves moisture and the densest of the forests, which cling to the slopes of the hills; it nestles in recesses to which the rays of the sun have never penetrated, and which are as pathless now as in the days when the Golden Tartars were dwelling in and cultivating the plain. The genuine Manchurian Ginseng consists of a stem from which the leaves spring, of a centre root, and of two roots branching off at the same point from each side of the centre root. The stem somewhat resembles the head and neck, and the side roots the shoulders and arms of a man; the main root represents the body, and a fork, which the main root frequently forms, the legs.

"The Chinese, with a not ungraceful feeling, believe that a plant which thus expands into the human form amid thickets and jungle on which the foot of man has never trod, must be intended to alleviate the sufferings of the human race. Its precious qualities are increased and intensified by age, and a plant is of no great value until it has been growing and gathering strength for at least an ordinary lifetime. The age, and consequently the value of a plant, are ascertained by a careful examination of the upper portions of the centre and side roots. These portions should be covered with rings, and the thicker and more numerous the rings the greater the age. The value of Ginseng in no way depends upon its length, thickness, or colour. I myself have seen here a delicate root weighing but 6 mace, which cost 50 taels. The upper portions of the root also possess the greatest healing power; the stem, which appears above ground, on the other hand, ought not to be eaten. It is supposed to be baneful rather than beneficial.

"In former years, the collection of Ginseng was in the hands of some forty merchants, who, on payment of a heavy fee, obtained the necessary authority from the Tartar General of Kirin. In addition to the fee, each merchant was bound to hand over to Government a certain weight of the object of his search. The search is continued from the end of April to the end of September. In it the merchants employed the outlaws whom the fear of punishment had driven to take refuge in these wilds, and who were compelled by their position to be faithful servants. These men underwent great hardships and incurred great dangers. Forced to wander far from the little patches of millet they had raised for their support, they were even menaced by starvation, and by the wolf, the tiger and the leopard; and not unfrequently the hardships were endured and the dangers were incurred in vain.

"In the time of Tankouang, Ginseng was becoming yearly more scarce and plants of any great age were rarely found. Finally, in order to arrest their utter extinction, the collection of the wild root was prohibited by Imperial edict. Steps were taken in Kirin to carry this order into effect, and measures were adopted to prevent the admission of the interdicted plant into China. Nevertheless, a very small quantity is still clandestinely collected—to a considerable extent, however, in Russian territory. The cultivation of Ginseng, though allowed, is not encouraged; it is, in fact, hardly recognized as Ginseng, as the tariffs of the various native custom-houses class it under the general heading of medicine. This course is not altogether unreasonable. The side branches of the cultivated plant are frequently broken off, and its premature growth and the means made use of to expedite its development often efface the resemblance from which it derives its name.

"With a view to produce a false appearance of age, hair is tied tightly round the upper portions of the root, but a practised eye can easily detect the deception. Ginseng is cultivated in Manchuria and in the Corea. The average Corean-cultivated Ginseng is superior to the average Manchurian; 84 piculs 27 catties of Manchurian Ginseng were exported in foreign vessels during the past year: the value was not two taels a catty."—*The Gardeners' Chronicle.*

NITRITE OF AMYL.*

Nitrite of amyl, $C_{10}H_{11}ONO_3$, was first discovered by M. Balard. It is an amber-coloured liquid, smelling and tasting like the essence of ripe pears. It was more fully investigated in 1859 by F. Guthrie, who specially noticed that it possessed the property of causing flushing of the face, throbbing of the carotids, and acceleration of the heart's action. He suggested that it might be found of value as a resuscitative in drowning, suffocation and prolonged fainting.† The substance attracted very little attention, however, till it was taken up by Dr. B. W. Richardson at the meeting of the British Association for the Advancement of Science, held at Newcastle in the year 1863; he read a report on "The Physiological Properties of the Nitrite of Amyl," and showed that when inhaled it produced an immediate effect on the heart, increasing the action of that organ more powerfully than any other known agent. If a little of the nitrite was dropped on bibulous paper, and its vapour inhaled through the nostrils, the action of the heart was instantly excited, the cutaneous surface became red, and the face was deeply flushed, assuming a bright crimson colour. Carried further, the nitrite excited the breathing and produced a breathlessness like that caused by sharp running or rowing. It did not cause anæsthesia. It could then, Dr. Richardson said, be considered (like chloroform twenty years previously) as a physiological curiosity, and looking at its intensity of action, he could not, at that time, recommend its use in medicine.

In 1864 the result of further researches was reported by Dr. Richardson to the British Association, at Bath. After an elaborate series of experiments he had found that nitrite of amyl is absorbed by the body, whether introduced by the skin, the stomach, the lungs, or by inoculation; that after absorption its effects are immediately seen on the heart and circulation; and that it might be considered the most powerful excitant of vascular action yet discovered.§ In 1867,|| and again in 1870,** Dr. Lauder Brunton advocated its use in cases of angina pectoris. In the discussion which followed the reading of the second communication before the Clinical Society of London, Dr. Anstie reported a case where a gentleman, who had suffered severely for twenty years from spasmodic asthma, and for four or five years from attacks of angina pectoris, a few seconds after one long inspiration through one nostril from a half-ounce bottle of the drug, "passed from a state of agony into a state of calm repose." It has also been used successfully in cardiac disease brought on by acute rheumatism, paroxysmal attacks of colic and traumatic tetanus. These cases show that in nitrite of amyl we have an agent of remarkable power and rapidity of action against some forms of severe suffering and pain. At present we know little of its powers for good or the limits to its employment; but enough is known to justify and encourage further research into its properties.

* Abstract from a series of papers on the "Progress of Therapeutical Science" in the *Medical Times and Gazette.*

† *Journal of the Chemical Society*, vol. xi. p. 245.

‡ *Medical Times and Gazette*, vol. ii. p. 334, 1863.

§ *Medical Times and Gazette*, vol. ii. p. 335, 1864.

|| *Lancet*, vol. i. p. 97, 1867.

** *Medical Times and Gazette*, vol. i. p. 320, 1870.

WATER SUPPLY.

Professor Frankland, in his report on the quality of the metropolitan water supply during the month of August, states that all the samples taken were clear and transparent when drawn from the mains of the companies, except that supplied by the East London Company, which contained suspended particles among which living organisms were found. The water abstracted by the Chelsea and Lambeth Companies from the Thames below its junction with the Mole exhibited nearly twice as much previous sewage or animal contamination as that abstracted by the other companies above the junction.

The water supply of Birmingham appears to be in much need of the improvement for which powers were obtained in the last Session of Parliament. The analysis by Dr. Alfred Hill of the supply to the borough on the 3rd inst. shows that it was "highly charged with nitrogenous organic matter," and that it was also "turbid and bright green with minute vegetation." Dr. Frankland urges that until the new supply is provided every exertion should be used to render the quality of the present supply less objectionable, by sand filtration for the removal of suspended impurities. The proportion of chlorine in the Birmingham water has increased from 1·41 part in 100,000 on the 10th of May to 7·44 parts in 100,000 on the 3rd inst.—*Registrar-General's Report.*

THE AMMONIA CURE FOR SNAKE-BITE.

Professor Halford, of the University of Melbourne, in a paper read before the Medical Society of Victoria, has reviewed at length the history of twenty cases of snake-bite treated by his method of injecting liquor ammoniæ into the veins during the last eighteen months. The *British Medical Journal* says that these cases were all in the hands of different practitioners in the colony, who have each reported on them. Recovery followed in seventeen cases. In thirteen of these, the practitioners in attendance expressly report that the patients were in a dying condition, and, in their belief, would soon have died, but for the employment of this remedy in the manner prescribed. The method employed was that introduced by Dr. Halford, and first brought to the knowledge of the profession here by him, in its pages, through Mr. Paget; viz., by injecting dilute ammonia—say, at the least, thirty minims of the liquor ammoniæ B. P., specific gravity 959—into a superficial vein; the vein being first exposed, and its coats pierced with the nozzle of a hypodermic syringe. Dr. Dempster, Dr. Rae, Dr. Langford, Mr. Dallimore and Dr. Meyler, each in his own words, and from the observation of separate cases, describe the curative effect as being immediate, and the recovery from collapse to be so rapid and startling as to be "almost magical." This method of treatment, of which such remarkable effects are detailed, has been sharply criticized; but Professor Halford successfully vindicates the claim of the snakes to be considered highly venomous—almost as much so, he intimates, as some of his London critics. They included the tiger-snake, the brown and black snake of Australia, which are affirmed to be as deadly as the cobra and rattle-snakes of India. Strong testimony to the efficacy of the treatment in saving life was borne by Australian practitioners who took part in the discussion, and vindicated Professor Halford's claim to be considered as the discoverer of a means of rescuing many from an otherwise inevitable death.

The *Medical Times and Gazette*, speaking of an article which has appeared in the *Melbourne Argus* on Professor Halford's claims in respect to his treatment of snake-bite, and referring to the misstatements on this subject in another medical journal, says, "It is almost impossible to understand how those statements could have been made and persevered in so ungenerously and unjustly."

The Victims of Scarlet Fever.—It is to be hoped that the plain manner in which the *British Medical Journal* has put before the public the price we pay for legislative inaction in sanitary matters will lead to such strong pressure upon the Home Secretary before next session that he will be compelled to lift a finger for the preservation of our lives. Four hundred and seventy thousand persons have died of scarlet fever and its allied disease, diphtheria, in the last twenty-two and a half years. Had these victims of one type of zymotic disease been soldiers whose lives had been sacrificed on the battle-field to inefficiency at the War Office, the whole nation would quiver with indignation; yet there can be little doubt that by far the larger proportion of those who have died of scarlet fever might have been alive now but for the utter inefficiency of our complicated sanitary laws and the neglect of domestic legislation which it is the business of the Home Office to initiate. One simple measure alone which we have before pointed out would probably have saved half if not three-fourths of the lives thus wasted. Disinfecting establishments in each district are the first steps necessary to put a stop to this horrible mortality. Under present arrangements bedding and clothing are allowed to spread infection far and wide. Among the poor, in nine cases out of ten, no steps are taken to disinfect these articles, and among the wealthier classes the very steps taken to purify the bedding of scarlet-fever patients only serve to disseminate the infection more widely, for the upholsterer who takes away the mattresses mixes them with other goods of the same kind, and for every family whose furniture is thus purified probably another family is attacked. Then, again, those who are able to afford it have the walls of the room in which the patient has been lying stripped of their paper, but no care is taken to see that the paper itself is destroyed. Until we have disinfecting establishments, with proper officers attached to them to see to these matters, fever will continue to spread and carry off its thousands; and until we have a Home Secretary who will make it compulsory on local authorities to take such measures as are dictated by common sense and experience for preventing the spread of infection and enforcing better house arrangements with the view of reducing the chances of disease, we shall still continue to die of scarlet fever at the rate of not less than 40,000 a year, that being the estimated number of deaths for last year, a rate which is annually increasing at compound interest.—*Pall Mall Gazette.*

The Defence of Paris.—The *Journal Officiel* publishes the following note:—"The Minister of Public Instruction has appointed a committee of *savants*, who are to concert with the military authorities means for applying to the defence of Paris all the latest results of physical and chemical science. M. Berthelot, Professor of Organic Chemistry at the Collége de France, is President of the Committee. Two Deputies, MM. Dorian and Genelot, represent the Corps Législatif. The first meeting of the committee was fixed for Saturday, September 3, at the Ministry of Public Instruction. Persons who may have communications to make or plans to suggest are requested to apply to M. Berthelot. Another committee, specially charged with the medical questions relating to the defence of Paris, is being organized under the presidency of M. Sée, Professor of the Faculty of Medicine." The *Opinione Nationale* comments upon the foregoing notice:—"We entirely approve the arrangement thus proposed. Since scientific barbarism is being hurled against us, it is the task of civilized science to defend us."—*Times.*

Thebolactic Acid.—Buchanan has obtained from opium an acid possessing the composition of lactic acid. According to his results, it appears to be identical with ordinary lactic acid. It does not affect polarized light, and in this respect differs from the acid discovered by Wislicenus.—*German Chemical Society.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 10, 1870.

STATE AID FOR PHARMACEUTICAL EDUCATION.

Though the existence of social distinctions in English society is a fact which must be recognized, we consider it by no means desirable that the lines which separate classes should be further deepened, still less that they should receive any extra impress or sanction through the operation of the law which notoriously professes to regard all classes and individuals as equal.

Schemes for the benefit of a particular class or section of the community may, indeed, have their peculiar recommendations, and custom would seem to indicate that sometimes they have; but we are disposed to think that the limited operation principle, as it may be termed, ought to be confined to measures that are of private and voluntary nature. No more logical objection, perhaps, could be urged against one section of the State associating in some good work for the benefit of another section than could be brought against any average form of private charity; but we hold that when the whole State, through its Executive or Government, moves to some work of amelioration or progress, the entire community should be regarded as eligible to participate in the benefit thereby conferred.

We are quite aware that practical legislation cannot always be carried out exactly in accordance with theoretical conviction; law-making is often of necessity tentative. There is, therefore, all the more reason for gratulation when changes are made that bring practice and abstract right closer together. We think this has recently been the case in regard to a matter affecting the interests of pharmacy, though perhaps the case we refer to can scarcely be called so correctly a change as the authoritative interpretation of a somewhat ambiguous statement.

We published in our impression of August 20, a correspondence between Mr. G. F. Schacht, the Hon. Sec. of the Bristol Pharmaceutical Association, and the Science and Art Department of the Government, and we now desire to call especial attention to that correspondence as containing a decision of great importance in more ways than one.

It is well known that amongst various methods adopted for the general diffusion of scientific knowledge, the Government has fostered the formation of science classes throughout the kingdom by a plan which, so far as it has been carried, yields most promising results. Briefly described, this plan consists in giving money payments to teachers in proportion as they succeed in passing their pupils through the ordeal of a certain annual examination, conducted by appointed professors. The teachers are thus enabled to demand from their pupils much smaller fees than would otherwise be necessary.

The published regulations, however, appeared to indicate that these money payments were only to be allowed when the student belonged to the operative class. The mischief likely to be produced by such a limitation (did it really exist) is obvious; for in many localities the classes conducted under the auspices of the Science and Art Department are the only opportunities existing in the whole neighbourhood for systematic study of science.

Considering how many persons above the operative class are in need of scientific education, but unable to obtain it except by some such means as that afforded by the Department of Science and Art, we are at a loss to perceive on what ground they should be excluded from participating in its advantages, while these are freely offered to persons of inferior social position.

It will be seen from the reported proceedings of the Bristol Pharmaceutical Association in last week's number, that Mr. Schacht and his friends at Bristol, putting a broader interpretation upon the intention of the Science and Art Department, have made free use of the science classes of their neighbourhood for the benefit of their students in pharmacy, reviving, indeed, the Botanical Class, and calculating upon receiving the aid of the Department in their endeavour to give scientific education to their apprentices and assistants. The decision contained in the correspondence already referred to fully justifies the course they had taken.

We would fain hope that this decision is a step towards such a perfect identification of practice with principle as we think desirable, so that these classes might become great centres of scientific education for students of every station and degree—so many colleges, indeed, of a grand national university.

Something of the kind may possibly be developed in the future; in the meantime there is no longer room for doubt that these classes are open, with all their systematic and economic recommendations, to the Pharmacists of this kingdom.

We are enabled to state that on the recommendation of the Committee appointed to consider the subject of provincial education, the Council has ordered an abstract of the returns lately sent in by the several provincial associations to be published. The Council has also invited the British Pharmaceutical Conference to bring forward the subject for discussion at its meeting next week. This will afford an opportunity for interchange of opinion amongst those best acquainted with the requirements of the case. Considering the vast importance of the subject, nothing could be more calculated to emphasize the hope we expressed last week as to the Society being represented at the Conference by its President and Council.

THE BETTS SUITS AGAIN.

Mr. Betts appears to share with the British soldier his proverbial characteristic of not being able to perceive when he is beaten; for, as will be seen from a letter in our correspondence columns, that persevering litigant is again returning to the charge, and notwithstanding the decision of the late Vice-Chancellor James, reported in this Journal some weeks ago, he is about to resume his crusade. We understand that Mr. Betts will not accept the adverse and condemnatory judgment of the Vice-Chancellor, but that he will appeal to the Lord Chancellor, and perhaps to the House of Lords. If he should not succeed in either quarter, it is difficult to conceive what further steps Mr. Betts may not take, but doubtless his inventive capacity would even then be equal to the occasion. If, however, he should succeed in obtaining a judgment in his favour, he will have obtained a means of levying patent royalty, which, if not quite novel, would be at least out of date, and sufficiently unusual in modern times to afford an interesting case for those who concern themselves with the working of the patent system.

However, the general facts of the case are too well known to need further mention, and beyond complying with the request of our correspondent to publish his letter, it is not our intention to deal with the subject. We must nevertheless take this opportunity of correcting a misapprehension that might arise from, and be suggested by, certain remarks of Mr. Betts at the late trial as to the position of the Pharmaceutical Society in regard to this litigation. It is not in any way a case between Mr. Betts and the Society, nor has it ever been; indeed, the Society has nothing to do with the matter. Many of its members, no doubt, are among the vast number of those who were either attacked or threatened by Mr. Betts, and for that reason only the Society, as a body, sympathizes with the defence offered to his attack, not only by members of the Society and druggists generally, but also by the great mass of grocers, oilmen, wine merchants, or any other traders who sell bottles covered with capsules.

The Central Working Committee of the Association for Giving Relief to the Sick and Wounded in the present war, has really determined to send out six surgeons "whose expenses will be paid, though their services, in other respects, will be gratuitous," and a Correspondent of the *Medical Times and Gazette* commenting on the fact, remarks that, in other words, a committee representing the charitable portion of the wealthiest community in the world, proposes to exercise their charitable feelings at the expense of the six young men in question, whose toil and risk will go unrewarded. From inquiries we have made we are enabled to state that this is not a correct view of the case, The Committee has not contemplated engaging surgeons or paying for services rendered by professional men, its action being limited to accrediting competent volunteers who may be disposed to give their services gratuitously. There are many reasons to induce surgeons especially to embrace this opportunity of doing good service in the cause of humanity, and there does not appear to be any just ground for complaining of the course taken by the Committee.

But, though this is a case entirely exceptional, we may in a general way take the opportunity of expressing our opinion that the practice of rendering "honorary services" in professional matters is, as a rule, both vicious and sophistical. It too often happens that those who render "honorary services," and affect to be superior to the rule that the labourer is worthy of his hire, do so in reality with the object of some ulterior advantage to themselves. In such cases "honorary service" is but a sham and a device, by which those who happen to have means to admit of their practising it, may gain an unfair advantage over others who are less fortunately circumstanced in that respect. As a case in point we may refer to the late proceedings of the British Association Sewage Committee, which, after collecting a large sum of money to enable its members to conduct an important public inquiry, has become impressed with the idea that the services of its members must be "honorary,"—the result being that the members of the Committee finding themselves reduced to the alternative of working at their own cost or not at all, most of those who previously took an active part in the work to be done, have been debarred from continuing their labours. It yet remains to be seen what, under these circumstances, is to be done with the money collected from various towns throughout the country, and what may have been the object of collecting that money, if the functions of the Committee were to be "honorary!"

There seems to be still some unpleasant feeling lingering in Edinburgh, consequent upon the selection last year by the British Association of Liverpool in preference to that city as the place of meeting for 1870. This has been shown lately by a letter which has appeared in the *Glasgow Daily Herald* relative to the announcement in a contemporary of the probable selection of Sir William Thompson as the next president. That journal, alluding to the saying attributed to Sir R. Murchison, that no person lower in the scale than a "live duke" would be sufficient to bring together a large meeting of the British Association in Scotland, remarks, "Sir Roderick may probably remember how far his prescription was successful when it was tried; and if he will help us to have the meeting in Glasgow, with Sir William Thompson in the chair, we will try to show him the reverse of the medal."

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

The following contributions have been received since last week :—

	£.	s.	d.
John Attfield, 17, Bloomsbury Square	1	1	0
John Beddard, 46, Churton Street, S.W.	1	0	0
C. F. Bevan, Harwich	0	5	0
Thomas Burn, Ranelagh Terrace, Pimlico	0	5	0
John Carr, 171, High Holborn	1	1	0
Thomas Crowther, Tickhill	1	3	2
Thomas Elvey, 8, Halkin Street, S.W.	1	0	0
Messrs. Fincham, 57, Baker Street, W.	1	1	0
R. H. Forster, Dover	0	2	6
W. Fox and Son, 109, Bethnal Green Road	2	2	0
G. C., London	1	0	0
John Lasham, Romford	0	10	0
John W. Lasham, ditto	0	5	0
Henry Lawrence, Godalming	0	10	0
W. B. Randall, Southampton	1	1	0
Thomas Robson, Brighton	0	10	0
W. H. Smith, Brighton	0	5	0
W. C. F. Sparrow, Ranelagh Terrace, Pimlico	1	1	0
R. Turner, 5, Chippenham Ter., Harrow Rd.	0	9	0
C. P. Usk	0	10	0

Per A. Barnett, Buxton :—	£.	s.	d.			
Alexander Barnett	1	1	0			
Mr. Hutchinson	2	2	0			
Per S. Manthorp, Local Secretary, Colchester :—						
Mr. Chaplin	0	10	0			
„ Clarance	0	10	0			
„ Cole	0	10	0			
„ Cushion	0	5	0			
„ Hammerton	0	10	0			
„ Manthorp	0	10	0			
„ Roger Manthorp	0	5	0			
„ Fred. Manthorp	0	5	0			
„ G. S. Manthorp	0	5	0			
„ Shenstone	0	10	0			
„ Prosser	0	10	0			
				£4	10	0
Per J. Whitfield, Local Sec., Scarborough :—						
A. D.	0	1	0			
H. Bland	0	10	0			
J. M. Crosby and Co.	0	10	0			
S. Eccles	0	10	0			
J. Hill	0	2	6			
J. P. Kington	0	2	6			
F. Oldfield	0	10	0			
Geo. Porrett	0	10	0			
Mark Rainton	0	5	0			
W. Robinson	0	5	0			
W. Robson	0	10	0			
J. C. Sewell	0	5	0			
J. Whitfield, 2nd don.	0	10	0			
				£4	11	0
Per W. Wilkinson, Local Secretary, Manchester :—						
Jas. Beard	0	10	6			
J. B.	0	1	0			
J. C.	0	2	6			
J. J. Pyne	2	2	0			
Sidney Taylor	0	5	0			
				£3	1	0

Hearon, Squire and Francis, 5, Coleman Street :—
- 4 oz. chloral hydrat.
- 4 oz. bottles tinct. opii.
- 1 lb. chloroform.
- 1 oz. quinine.
- 4 8 oz. bottles of sal volatile.
- 1 doz. assorted bandages.

Bradley and Bourdas, 48, Belgrave Road, S.W. :—
- 3 lbs. chloroform in ½ lb. bottles.
- 3 lbs. laudanum in 4 oz. bottles.
- 4 lbs. sal volatile in ditto.
- 5 lbs. syrup chloral hydrate in ditto.
- 12 gross ¼ grain morphia pills in bottles containing 4 dozen each.
- 6 gross 1 grain opium pills in ditto.
- 4 gross 2 grain quinine pills in ditto.
- 1 dozen large honeycomb sponges.
- 1 dozen carbolic acid and Condy's fluid.
- 6 yards adhesive plaster.
- 6 lb. lint.

Robert Hampson, 63, Piccadilly, Manchester :—
- 12 gross 1 grain opium pills in bottles containing 4 doz. each.
- 12 gross ¼ grain morphia pills in ditto.
- 6 gross 2 grain quinine pills in ditto.
- 4 2 oz. bottles of chloral hydrate.

Harvey and Reynolds, Leeds (2nd donation) :—
- A quantity of waterproof material, and a small quantity of lint.

J. E. Lidwell, High Street, Notting Hill :—
- 10 yards bandages.
- 2 lbs. lint.
- Quantity of linen.

John Mills, Eastgate Row, Chester :—
- 24 doz. 1 grain opium pills.
- 24 doz. ¼ gr. morphia pills.
- 24 doz. 2 gr. quinine pills.

W. Smeeton, Commercial Street, Leeds :—
- 3 doz. bottles, each containing 4 doz. 1 grain opium pills.
- 6 bottles, each containing 4 doz. 2 grain quinine pills.
- 2 doz. 2 oz. bottles of laudanum.
- 2 doz. 2 oz. bottles of sal volatile.
- And a quantity of lint.

R. Turner, 5, Chippenham Terrace, Harrow Road :—
- 6 boxes 1 grain opium pills, 4 dozen in each box.

Subscriptions should be sent to Mr. Bremridge, Treasurer to the Fund, 17, Bloomsbury Square.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

PROGRAMME OF PROCEEDINGS.

Liverpool, Royal Institution, Colquitt Street, September 12 *to* 20, 1870.

A Reception Room, where members and visitors may assemble, write letters, and obtain information, has been provided by the Local Committee, at 16, Adelphi Hotel, Lime Street.

The Exhibition of Objects relating to Pharmacy will be open throughout the week in the room over the Savings Bank, 93, Bold Street. Members and other visitors will be admitted to the Exhibition and the meetings on writing their name and address in the doorkeeper's book.

Monday, September 12.

The Executive Committee will meet early in the evening.

JOHN ABRAHAM, Esq., V.P., Chairman of the Local Committee, will receive the Officers, Resident Members, and Visitors prominently known in connection with pharmacy, at his house, 141, Smithdown Lane, at 7.0 P.M.

Tuesday, September 13.

The Conference will meet at 10.0 A.M., adjourning at 12.30 P.M.; the meeting will be resumed at 2.0 P.M., adjourning at 4.30 P.M.

The business of this day will comprise:—

Election of Members.

(Nearly one thousand names of candidates have been received by the Secretaries.)

Report of Executive Committee.

Financial Statement.

Reception of Delegates from Pharmaceutical Societies and Associations.

The President's Address.

The following and other papers will then be read:—

1. Report on the Purity of the Yellow Bees'-wax of Trade. Edward Davies, F.C.S.

2. Saccharo-Chirettine: a New Preparation of Chiretta. David S. Kemp, F.C.S.

3. On the Strength of twenty-four Specimens of Saccharated Carbonate of Iron. Mr. J. J. Nicholson, Sunderland.

4. Chloral: Note on the Best Forms for Internal Administration. Joseph Ince, F.C.S., F.L.S.

5. The Apprenticeship and Early Training of Pharmacists. Mr. F. B. Benger.

6. (Not yet received by the Secretaries.)

7. Analysis of Bitter Cassava Juice, and Experiments in Elucidation of its supposed Antiseptic Properties. Professor Attfield.

On Tuesday evening, at 6.0 P.M., a dinner, at the 'Adelphi Hotel,' will be given by the Local Committee to the President and Officers of the Conference. The Local Secretary, Mr. Davies, requests that gentlemen desirous of being present will communicate with him during the day, either at the Royal Institution or at the 'Adelphi Hotel.'

Wednesday, September 14.

The Conference will meet at 10.0 A.M., adjourning at 12.30 P.M.; resuming business at 2.0 P.M., and adjourning at 4.30 P.M.

The business of this day will comprise:—

Election of Members.

Reception of Letters of Invitation to the Conference for 1871.

Papers to be read:—

8. A Century of Old Books. Joseph Ince, F.C.S., F.L.S.

9. A Few Notes on Aloes. William A. Tilden, B.Sc., F.C.S.

10. Sulphite of Zinc. C. R. C. Tichborne, F.C.S.

11. The Storing of Poisons. Mr. Edward Smith, Torquay.

12. Ammoniacal Salts from Gas-Liquor; purified to fit them for use in Pharmacy. W. L. Scott, F.C.S.

13. The chemical constitution of Sulphurated Potash. John Watts, D.Sc.

14 to 21. Papers are expected from Messrs. Greenish (lint), Benger (apparatus for maintaining constant temperatures in laboratory operations), Linford (a new hydrometer), Scott (purity of commercial alkaloids and lithium salts), and from other members.

Thursday, September 15.

On Thursday there will be an excursion to Widnes and Runcorn at 1.30 P.M. from Lime Street Station. Messrs. Hutchinson and Co. and W. Gossage and Sons, at Widnes, and the Runcorn Soap and Alkali Company have liberally thrown open their works to the inspection of members, and the party will have an opportunity of inspecting the magnificent bridge recently built over the Mersey by the London and North-Western Railway Company. At 7 o'clock a collation will be provided by the Local Committee at Halton Castle, a ruin on an eminence commanding an extensive view of the surrounding country. Members of the Conference and subscribers to the local fund will be provided with tickets, entitling them to a return railway ticket at 1*s.* 6*d.*, on application to Messrs. Clay and Abraham, 87, Bold Street, not later than Tuesday evening.

Tuesday, September 20.

Election of Officers for 1871. Appointment of Place of Meeting for 1871.

By the kindness of the committee of the Lyceum, No. 1, Bold Street, the news room of that institution will be open to members of the Conference during the week.

SOCIETY OF ARTS.*

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture II.

We left off last week at a point at which we had come to recognize a difficulty, which we did not, to any appreciable extent, succeed in solving. By considering in succession a certain small number of processes in which substances induced chemical changes in others which were in contact with them, we classified them, beginning with some very complex cases—cases in which substances of formulæ so long that, even if I ventured to give you chemical formulæ at all, I should hesitate to give you their formulæ—took part in the decomposition, and gave rise to products themselves having formulæ of no small complication. From those we passed to the consideration of some bodies less complex in their structure, and undergoing changes very much like those which we at first considered, but having this remarkable peculiarity that, in these somewhat simpler cases, the changes were effected not only by organic bodies comparable to ferments, but also, in certain instances, by simple mineral bodies, such as the acids. In this intermediate class we found that the same effects are produced, sometimes by diastase, or such-like bodies, and sometimes by sulphuric acid. Then we came to some still more simple cases of decomposition, produced solely by bodies of such simplicity that we chemists have got a tolerably definite idea of them. I gave two cases which, I believe I may say, are pretty well understood. The resemblance between the different terms of that long series served, as I think it will be admitted by those who followed the chain of reasoning, as an argument in favour of there being some great resemblance in the process which takes place in these changes in the successive terms of the series; and I propose, before we proceed further in the study of these wonderful decompositions, to analyse somewhat the nature of these changes in the simple cases which we last considered, in order that we may get, if possible, something like a master-key—a very simply-formed piece of iron—which will open a variety of locks. The two cases which I allude to were, first, the formation of ether and water from alcohol by the action of oil of vitriol; and, secondly, the ordinary process of making oil of vitriol in the so-called lead chambers; and I think it will be admitted, even from the very brief and imperfect statement which I was able to make, that we have evidence of the fact that the active substances do return, after they have been doing one bit of that work, to the point from which they started before doing it. I gave a couple of illustrations of that fact. Sulphuric acid is converted, while making alcohol into ether and water, into a substance called sulpho-vinic acid, which differs from it in a good many properties, and then it comes back again to sulphuric acid. Just so with nitric oxide, in the process of making oil of vitriol; it first takes up oxygen and assumes the form of those red fumes, then hands that oxygen over to the sulphurous acid which is in contact with it, thus coming back again to the state of nitric oxide from which it had started. Hence the term which I have suggested for this process is cyclical, to denote the fact, which I consider essential, the leading

* Cantor Lectures.

fact that it is a cycle, the idea of which implies that the road by which it returns is not the same by which it goes, and I want that idea to be suggested by the word. In the case of etherification, I wish I could lawfully use formulæ on the black board, but it would not do, for I am sure that the greater number of my audience will agree with me that it would be a liberty which I ought not to take; but chemists are in the habit of denoting, by the aid of formulæ, particulars which require to be fully explained. I mention that because, excluding that ordinary process, the particulars of my argument must, of course, be omitted, inasmuch as I do not use the language by which alone those particulars can be conveyed. When the sulphuric acid acts upon alcohol, and transforms it, by a succession of these cyclical processes, into ether and water, the general kind of process is this:—A little particle of the acid—because each one acts like the rest, and we had better consider one as a sample of the rest—first takes something from a contiguous particle of alcohol, and then it hands over this something to another particle of alcohol. That which the acid takes in the first instance is called, in our ordinary language, ethyl. It is a group consisting of carbon and hydrogen, very much like hydrogen gas—it is a group of those elements, and behaves in a manner closely analogous to hydrogen itself. The acid, in doing that particular work which we have to consider, first takes a particle of this ethyl from one particle of alcohol, and whilst it does so, it gives to the alcohol something in exchange; that something is hydrogen. And by doing this, the sulphuric acid which has taken up this ethyl is converted into sulpho-vinic acid; it has gone half round the circle, in fact. The remainder of its journey consists in reversing, in another way, with another particle of alcohol, that very same kind of interchange which it had undergone in the first instance, that is, it gives up again this little portion of ethyl which it had taken, and resumes hydrogen in place of it. Just as that is the general process when sulphuric acid acts upon alcohol, forming it into ether and water, so in the other process, which I just now reminded you of, there is a similar action, only there is this difference—of course, I speak within those narrow limitations which are imposed upon us by our very imperfect knowledge of even these best-known processes—but, as far as we know, the nitric oxide merely takes up oxygen, but gives up nothing in exchange. Those red fumes which you saw were really nitric oxide *plus* oxygen, not nitric oxide in which oxygen had replaced something else, and that was a difference between the process in that case and in the one to which I just now referred. Then, again, it simply gives up that oxygen to the particle of sulphurous acid.

The illustrious Liebig, to whom we owe, in this order of phenomena as in every other order which he has touched, some of the most valuable ideas which have guided our researches, suggested many years ago, for the explanation of the phenomena of fermentation, a theory which certainly has rendered very great service, and not the less so from the fact that it has been replaced by one more perfect. In building a house, it is certainly no proof that a scaffolding is unnecessary that in the final structure the scaffolding is not maintained; and so in the progress of our science, as in every other science, each part of the work must be judged from its usefulness in aiding the carrying on of the building, even though the particular substance which was placed there at the time does not finally form part of the structure itself. Liebig's explanation really is classic, and well worthy of a few minutes' consideration. He classed together a considerable number of cases of chemical action which bore, at least upon their surface, a considerable resemblance to one another, and he saw in them something in common, and by this one resemblance which they had he classed them, considering it to be their essential characteristic feature. For example, there is a substance which is made, by a process of oxidation, of a compound something like lime. It is called baric peroxide. Thenard had found that the oxygen which is here taken up by the baryta can, by a particular process, be passed over to water, so that, in fact, Thenard, from this oxide of baryta, made, by a process which I will repeat on a small scale, some oxidized water, or peroxide of hydrogen, as it is commonly called. Here is some of the peroxide suspended in water, and by adding an acid hydrogen salt, the hydric nitrate, in small quantities (for if I add it in too large quantities, I should destroy the peroxide, which is a very tender substance, and requires to be treated tenderly), I should gradually transfer the oxygen from the baryta, with which it was at first combined, to the water which is here present. This oxidized water, or peroxide of hydrogen, gives up the oxygen which it has just taken up very easily indeed; in fact, the difficulty is to prevent it doing so. Amongst processes of that kind, I will show you one simple one. I will pour into the water in this large beaker-glass some of the solution which I have just prepared, and then add to it a few drops of this red liquid, which is a solution containing chromic acid combined with potash. You see, no doubt, that although I have only added half-a-dozen drops, there is evidence of a chemical change, and the deep blue colour which is formed by the contact of the two liquids is due to the formation of a new compound. The chromic acid, which has a red colour, takes up oxygen from that peroxide of hydrogen, forming a blue compound. I have purposely chosen this particular instance, because the process is a slow one, and we have time to see its intermediate changes. I will leave the glass here, and in a few minutes you will see the blue colour will have disappeared, and in place of it we shall have a dirty green colour, hardly visible. Whilst that change takes place, if we were to take means to examine carefully what was going on, we should find that oxygen gas passed off, and if we examined the green substance present at the end of the process, and compared it to this original red chromic acid, we should find that it consists of chromic acid *minus* oxygen. The peroxide takes away oxygen from this chromic acid, and yet the chromic acid has got hold of its oxygen pretty firmly; it requires a considerable amount of energy to tear away even that part which is torn away by the process. But at the same time the oxygenated water is losing part of its oxygen. The deoxidation of the peroxide induces the chromic acid to give up some of its oxygen; the one body induces in the other a change similar to that which itself is undergoing. The peroxide of hydrogen is losing oxygen, and it makes the chromic acid also lose oxygen. To state the process in general terms, I may well use the expression of Liebig, and call it contagious action. There are many other cases of similar processes. Here is a bit of rotten wood; if I were to moisten it and put it into a convenient flask, leaving room for a quantity of air, closing the mouth of the flask with a good cork, and leaving it for a day or two, also putting with the air a little hydrogen gas, which, you know probably, is capable of combining with oxygen, I should, on examining the mixture of air and hydrogen after it had been in contact some time with this rotten wood, find that the hydrogen had been removed from the air, and at the same time the oxygen of the air which had been mixed with it had disappeared. Now this wood is actually undergoing a process of combustion; it is actually absorbing oxygen, or being burnt, very slowly indeed, but still at a rate which is not unimportant, if you want it to last for any length of time. De Saussure, who noticed this, attributed the oxidization of the hydrogen gas to the fact that the wood is itself undergoing oxidation. I will take another case of the same kind. I will put into a little flask some of that peroxide of hydrogen, and will show you another decomposition of it, which is rather more convenient in one respect than the one I first took, as it will show us something more of the process. Into this little flask I put some of the same oxidized baryta which I used just now, and I will fit up the flask in such a manner that the gas, which will come off in a tolerably large quantity, can be collected for examination. I will then put in contact with it a substance called silver oxide, first driving out of the flask all the air which it at present contains. Having driven out the air, I put in a few drops of the nitrate which I employed in the first instance, and then I will put in a solution of silver oxide, which is, in some respects, a good deal like this chromic acid, at all events in one important respect, for it has oxygen, which it can give up under sufficiently strong pressure. You now see there is a great deal of effervescence going on, and the gas which is coming off from the little flask is rising into this jar, where we shall very easily be able to ascertain whether it is oxygen by the ordinary test. I should have been glad, if it had been convenient to do so, to give you one other instance in which a remarkable fact was discovered by Professor Brodie, viz. a case of an action of this kind, where the oxygen taken from the peroxide is in quantity exactly equal to the quantity of oxygen from the other body. Whilst that gas is collecting, I must enter shortly upon a theoretical question, apologizing for doing so, not that I am ashamed of it, for it is one of the most important theories we possess, but on account of the brevity with which I am compelled to treat it. Oxygen, in the free state, is admitted by chemists to consist of two little atoms linked together. In each of the compounds which I used there was one little atom of the kind. One atom leaves each of them, and when I get free oxygen, I affirm that there has been a process of combination, that the oxygen from the one substance actually combined chemically with the oxygen from the other. This is a theoretical result which has been, in great part, established by Sir Benjamin Brodie, with the help of materials from various sources. What I mentioned in the other case holds good equally in regard to chromic acid and the other cases in which there was apparently no definite proportion of the kind. There is an actual chemical combination between the oxygen of one substance and that of the other, it is not merely that the one substance is compelled to decompose because the other is decomposing; there is between the one substance and the other an interchange, so that a constituent from each one combines with a constituent from the other. To do justice to the importance of this fact I should need to describe a great number of chemical reactions, which at present would be impracticable, but you may take my word for it, that the kind of process which I have described is now known to be one of the commonest in chemistry. The other day, when I mixed two of the commonest substances, there were interchanges between the constituents by a process perfectly analogous to that which takes place here. Here it happens, by an exceptional circumstance, that the element which from the one body combines with the element of the other is of a like kind, whereas, as a rule, you find that unlike elements unite together in these processes. Thus it is that the anomaly which Liebig noticed ceases to be an anomaly, and is brought back to a case of common regular chemical action by the aid of that theory to which I have just alluded.

To return to our experiment. This glass vessel is now full of the gas, and by applying a taper which has been lighted and blown out, but is still glowing, we shall find, on putting it into the jar, that it immediately ignites, which is the ordinary test of oxygen gas. By the aid of that theory, which has been discovered since the time of Liebig's suggestion, this one case of apparently anomalous action has been proved to be a perfectly normal and regular case of combination, and the same kind of thing has been done with regard to other cases of the same description. A number of other processes which he classes with these may be shown to be due, not to any exceptional force that is at work in these cases, not to the force of any particular contagious action among chemical substances, but to the ordinary forces which induce chemical combination in the cases best known to us. Liebig's theory of contagious action has been alluded to, by a high authority in this country upon philosophical matters, as being a law of chemical action of a generality comparable to the law of gravitation in astronomy, and for that reason, if for no other, it must be of considerable importance to know what bearing our most advanced knowledge has upon that law. I dare say you see the connection between it and the case of fermentation. I will not go into particulars, further than is necessary in order to show you the general analogy.

First, I will take the case of alcoholic fermentation, as being the case best known. The ferment consists of little cells—which I hope I shall be able to show you at our next meeting—each one containing several chemical compounds, but itself a little living being. I will not say at present whether they are animals or plants. When you have these little organisms in water, or sugar, or in any moist substance, they are constantly, and of necessity, undergoing decomposition. You may arrest the decomposition by various agents, but if you do so, you kill them, or suspend their activity as yeast. No case is known to us of their acting like yeast without undergoing at the same time a process of chemical decomposition,—being broken up into simpler substances than those which were contained in them. I pointed out, last week, that the sugar which is being decomposed by the yeast is by that process being broken up into substances which were contained in it, and that was what Liebig noticed. He said that this yeast is a substance which tends to decompose,—it is breaking up into simpler substances, and it induces in these particles of sugar which are in contact with it a decomposition similar to its own. The action which it is undergoing is contagious, and passes over to the contiguous particles of sugar; and he adduced cases like that of oxygen, as affording analogies among simple well-known bodies. I think what I have said with regard to the case of oxygen will be sufficient to show you that in those simple cases the idea of contagion is certainly not applicable.

A foreigner, who was describing some time ago the luxuriance of the crops in America, spoke of a bushel of *mice* being sown in a field, and a hundred bushels of *mice* being reaped. Of course, what he meant to say was *maize*, or Indian corn; but I am reminded of that anecdote by the necessity I am under for a moment of asking you to consider for a while some living beings under their general functions only. Suppose you had a bushel of actual English mice, and you put them into a granary full of corn. There clearly would soon be a great change. You are supposed to know nothing more about the particular organization of these little beings than you know about the particular organization of the little yeast-cells. You know that these little things eat grain, and that in place of the grain which they eat there appear various products of decomposition, which can be easily collected and examined. They give off carbonic acid, and so forth, and if you examined the state of that granary after a time, you would find a chemical change, or rather a set of chemical changes, going on in the organisms of these mice. The substance of which they consist would be actually wasting away; they would be giving off carbonic acid, and nitrogenous and other products. And if you also examined the state of the corn which was there at first, you would find that it finally passed over into these same products; and I say that the theory of contagious action is as much applicable to the action of the bushel of mice in the granary full of wheat, as to the action of the yeast cells upon a solution of sugar. There is in the one case, as in the other, an assimilation by the living organism of the material upon which it acts. The materials undergo certain changes, of which the general results are known to us, but of which the particulars are, I may say, in the main almost completely unknown. As to the processes by which these products are formed, it is as well to say that we do not know them. We know a little here and there about them, but it is nothing compared to our ignorance; therefore the resemblance is the more striking, and if we were to believe in the contagiousness of chemical action as applied to the case of the assimilation of sugar by a ferment, and say the ferment gives off alcohol and carbonic acid, and that sugar is also resolved into alcohol and carbonic acid, we should really be describing in its general features a process analogous to that which I have just now mentioned; such a general analogy would be readily admitted by those who go into the particulars of the process, but I think it is of particular importance to have in addition to it something more practically useful to guide us in understanding chemical reactions. For that purpose I will take one or two chemical reactions of an exceedingly common kind. For instance, I will again take that chromic acid solution which I just now employed. Here you see is the green residue which I told you would be produced; I again take some of this chromic solution, throw some of it into water in this jar, so as to visibly tinge the water red; I will slightly acidulate the liquid by oil of vitriol, and I will then pour into the mixture (which I will describe as chromic acid dissolved in water, for the potash which was present is taken away from the compound by the sulphuric acid), a substance which I will merely describe as being greedy of oxygen, sulphurous acid. If Liebig's theory of contagious action were generally true in chemical action, you would no doubt expect that this sulphurous acid, in taking up oxygen, would make the chromic acid also take up oxygen. It is quite possible for the chromic acid to do so, for that blue substance which we had in this jar at first was nothing but chromic acid with oxygen added to it. But instead of this, we shall have at once a reduction of the chromic acid to deep green, which I dare say appears to you almost black. It is precisely the same thing as that pale, dirty green which you saw before, but in its concentrated state. There is no oxygen taken up by the chromic acid, but it at once loses oxygen. This sulphurous acid wanted to combine with oxygen, and it tore away at once some of the oxygen from the chromic acid, and there was in this chromic acid a process, not similar to that which the sulphurous acid underwent, but a process precisely opposite to it—one combined with oxygen while the other lost oxygen,—and if you examined the liquid, you would find that the sulphurous acid which took part in the process, and has taken up oxygen, is now in the form of sulphuric acid. Again, I have here some granulated zinc, which will very easily evolve hydrogen, particularly when its activity is stimulated by throwing a little copper vitriol on to it. After adding a little water, I will throw in a little oil of vitriol, so as to get an evolution of gas. Then I have here a solution which I think must look black to you, except at the edges, which is a solution of a beautiful salt called permanganate. It is used for deodorizing certain fetid waters, and I might compare it to the chromate I was using just now. It consists of an acid of the metal manganese. If I throw some of that into the mixture which I have just prepared, and leave it for a short time, and then examine it, we shall find that, instead of being induced to give off hydrogen like the other body, which is doing so vigorously, we shall find it will do the opposite, and will combine with hydrogen; and the colour which belongs to it, and which can be recognized so easily, will disappear, because hydrogen will be taken up by its oxygen, and it will be reduced and brought down to a substance containing comparatively little oxygen. There, again, as in the previous case of the chromic acid, we find that there is a kind of chemical polarity in the general mode of action, that the one substance acted upon does precisely the opposite of the other. There is no tendency in this case to do the same thing, but the two substances acting upon one another do precisely the opposite, the one taking up what the other loses. Not only is that the case in the instance of the action which I have mentioned here, but in a great number of other cases of considerable interest and importance,—bodies which act chemically with considerable energy when allowed to do so, are prevented by others from so doing when those others are trying to do the same thing. If, for example, we put metallic copper into nitric acid, the copper would dissolve with immense energy: it would undergo what I might call a process of combustion. Again, if I put mercury in contact with the acid, the same thing would occur; it would be dissolved almost as rapidly as the copper. But if I put the two together into nitric acid, the copper prevents the mercury from undergoing combustion; and so far from encouraging it to do the same thing, it actually takes from it the power which it possessed before of undergoing a combination of that kind. And more than that, if I take mercury which has been burned—a solution of mercury in the form of corrosive sublimate,—and put copper into it, the copper will actually unburn it, or make it come back again from the point at which it had got, and throw down the metal. You can see the process which takes place; on putting a strip of clean red copper into the solution, it becomes grey, and throws down the mercury from the solution. So far from encouraging the mercury to oxidation, it makes it do the opposite to that which it otherwise had a tendency to do.

Again, I will take some of this solution of copper—it ought to be some of the very solution which is being made here, where copper is being dissolved at the expense of mercury—and if I put into it a piece of common iron, perfectly clean and white, it will very speedily combine; and I cannot express its functions in combining better than by saying that it will make copper uncombine, for the copper which was burnt is now being unburnt.

If we go carefully, with the knowledge of their particulars, through the best-known chemical processes, we find that there is, as a rule, a force at work which I might describe as polarity—a tendency among contiguous particles which are acting on one another to assume functions which can be best characterized as being opposite to one another. Whatever the one is doing, the other is doing as nearly as possible the very opposite of it, and any tendency to do like work I know not of. There are, however, cases which would appear to be favourable to the notion of contagious chemical action. If I blow out that gas-burner, still letting the gas escape, and then bring near to it a burning splint, it will set fire to the gas, and the same with a candle-wick if I bring close to it a burning match—the match, which is burning, communicates to the wick the process which it is undergoing,—but the explanation is this, it does so merely because of the high temperature which it has attained. If by any other process, such as concentrating the rays of a powerfully-heated surface by means of a lens, I raise the temperature of the gas to that point at which it is capable of combining with the oxygen of the air, it will do just as well. The accident that the high temperature is communicated by the burning splint has nothing to do with the process.

(*To be continued.*)

Hypodermic Injection of Calomel for Syphilitic Diseases of the Eye.—Professor Quaglino and Dr. Soresina give the details of a considerable number of cases where this plan of treatment has been successful in various ophthalmic diseases of syphilitic origin. The calomel was sometimes injected hypodermically into the temples, sometimes into the arm, great benefit being obtained in every instance.—*The Practitioner.*

Parliamentary and Law Proceedings.

ALLEGED EXTENSIVE FRAUDS ON THE REVENUE.

Clerkenwell Police Court, *September 6th.*

John Sutton, of 15, Regent Square, St. Pancras, was summoned before Mr. Cooke, for alleged frauds upon the Inland Revenue Department.

From the evidence it appeared that an officer of stamps went to No. 15, Regent Square, and there found the prisoner exposing for sale drugs and medicines which by law were chargeable with stamp duty. There were no less than 337 bottles containing drugs and medicines so liable, to which the paper cover, label, or stamp provided by the Commissioners of Stamps had not been affixed. The penalty for the offence is £10 in each instance, and the defendant had thus subjected himself to a fine of upwards of £3000.

Upon the application of the defendant's solicitor, the magistrate adjourned the hearing of the case for a fortnight.

The Growth of the Mistleto on the Oak.—In the volume of Transactions issued lately by the Woolhope Naturalists' Field Club, there is a photographic illustration of the Mistleto Oak of Deerfold Forest, one of the few known instances of the growth of this parasite on the Oak. Dr. Bull, in speaking of it, says, "This very interesting tree grows in the hedgerow of a field called the Harps at Haven Aymestry, in the ancient forest of Deerfold, on the property of the Messrs. Fortey. It was discovered in the spring of 1869, but the Mistleto must have been growing on the Oak for some years. The Oak is of the variety *sessiflora*, and may be some fifty or sixty years old. At 5 feet from the ground it measures 3 feet 8 inches in girth. The Mistleto is a female plant, and grows high up in the Oak on the main stem of the tree, after it has bifurcated. It forms a large spreading bunch, with a diameter of 3 feet 6 inches, and springs out from the Oak in a single stem nearly 4 inches in circumference. The Mistleto is also growing on a Thorn in the hedge immediately below the bunch in the Oak, and has probably sprung from a seed dropped by the birds from above. The great rarity of the growth of Mistleto on the Oak is proved by the fact that there are but eight examples which have been well authenticated as existing at the present time. They are to be met with in the following localities:—Eastnor Park, Herefordshire; Tedstone Delamere, Herefordshire; the forest of Deerfold, Herefordshire; Frampton-on-Severn, Gloucestershire; Sudbury Park, Chepstow, Monmouthshire; Burningfold Farm, Dunsfold, Surrey; Hackwood Park, Basingstoke, Hants; and one near Plymouth."—*Gardeners' Chronicle.*

A New Preparation of Cotton for Stanching Hæmorrhage.—Dr. Ehrle, of Isny, calls attention, in the *Schwabischer Merkur*, to a simple preparation of cotton, which he has found of great service in surgical operations followed by great effusion of blood. The mode of preparation is as follows:—American cotton of the best quality should be cleansed by boiling it for an hour in a weak solution of soda (about 4 per cent.), then repeatedly washed in cold water, pressed out and dried. By this process it will be perfectly disinfected and adapted to more ready absorption. After this it should be steeped once or twice, according to the degree of strength required, in liquid chloride of iron, diluted with one-third water, pressed and thoroughly dried in the air, —*neither in the sun nor by the fire*,—then lightly pulled out. The cotton so prepared will be of a yellowish-brown colour. It must be kept very dry, as it is affected by the damp. Lint may be similarly treated, but the fine texture of the cotton renders it preferable. When placed on a fresh wound, it causes a moderate contraction of the tissue, and gradually coagulates the blood in and beyond the injured veins, thus closing the source of the effusion. This property of the chloride of iron is increased by the dryness of the cotton and the extended surface offered for the development of the chemical action.

A New Eye Salve.—The following ointment is recommended by Dr. Williams, of Cork, after long experience, in cases of granular lids, and all cases of chronic ophthalmia:—

℞ Arsenici Sulphureti gr. ij
Unguenti Citrini ʒij
Axungæ Præparatæ ʒvj.
M. bene.

In cases of "granular lids" the upper eyelids should be everted, and a piece of ointment the size of a hemp-seed should be applied with a camel-hair pencil to the diseased conjunctiva.—*Dublin Quarterly Journal of Medical Science.*

Poisoning from Arsenite of Copper on Wall-paper.—A case of poisoning is reported in the *Lancet* which illustrates the danger of using arsenite of copper for decorating paperhangings. A retired master mariner, living at St. David's, was seized with what appeared to be an attack of English cholera. The symptoms, which were very severe, were not subdued until after twelve hours' medical treatment. Upon inquiry, it appeared that he had been employed during the whole morning of the previous day in removing the paper from the walls of a room previous to having it repapered. The paper last put on was a purple one, but underneath it was another of a green colour, which had been on the walls about fifteen years. He had much difficulty in removing this; indeed, nearly the whole of it had to be scraped off by a knife. This operation caused a great deal of dust to rise from the paper, frequently compelling him to close his eyes in consequence. He must thus have inhaled a considerable quantity of arsenite of copper, which occurred thickly on the paper, and was easily rubbed off. The symptoms also indicated inhalation of the poison. Previous to the attack he had been a strong, healthy man, and had never suffered from cholera or cramp, although he had been abroad a great deal.

Power of Opium to Relieve an Exhausted Frame.—Dr. Barnes, in 'A Visit to Scinde,' says:—"On one occasion I made a very fatiguing night march with a Cutchie horseman. In the morning, after having travelled thirty miles, I was obliged to assent to his proposal of halting for a few minutes, which he employed in sharing a quantity of about two drachms of opium between himself and his jaded horse. The effect of the dose was soon evident in both, for the horse finished a journey of forty miles with great apparent facility, and the rider absolutely became more active and intelligent."—*Food Journal.*

Indian Hemp in Menorrhagia and Dysmenorrhœa.—Dr. Silver publishes several cases of these affections in which the tincture of Indian hemp has proved of great service, because he thinks its value in them is not sufficiently known.—*The Practitioner.*

The following journals have been received:—The 'Brithis Medical Journal,' Sept. 3; the 'Medical Times and Gazette', Sept. 3; the 'Lancet,' Sept. 3; the 'Medical Press,' Sept. 7; 'Nature,' Sept. 1; the 'Chemical News,' Sept. 2; 'Journal of the Society of Arts,' Sept. 2; 'Gardeners' Chronicle,' Sept. 3; the 'English Mechanic,' Sept. 2; the 'Practitioner' for September; 'Union Pharmaceutiaue' for August; 'Repertorium für Pharmacie' for September; 'Medical Mirror' for September; the 'Pharmacist' for August; the 'Food Journal' for September; 'Journal of Applied Science' for September.

We have received the 'Ulverston Mirror' for Sept. 3 from Mr. H. W. Mackereth.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

THE BETTS CHANCERY SUITS.

Dear Sir,—Will you kindly insert the accompanying in the next number of the PHARMACEUTICAL JOURNAL?

Yours truly,
W. T. COOPER.

"LONDON, 1st *September*, 1870.

"DEAR SIR,—We have again to address you on the subject of the BETTS SUITS, partly in the nature of a report of what has been accomplished, and in part to show that more remains to be done.

"The *Times* of June 30th, the *Standard* of July 2nd, the PHARMACEUTICAL JOURNAL of July 9th, and the *Chemist and Druggist* of July 15th contain reports of the proceedings which resulted in the dismissal of the Bills filed by Mr. Betts in these suits; but since those dates the plaintiff has brought the cases before the Lord Chancellor, and obtained an order under which he has appealed. We are advised that, if the appeals be properly contested, the defence will continue successful, and for that object we need and earnestly solicit your co-operation.

"So long a time has passed since the Betts Suits were instituted, and our Committee and Defence Fund formed, that the general consternation which once prevailed has passed away, and perhaps to an extent become forgotten; we therefore venture to remind you of the facts.

"Twenty-five Bills in Chancery were filed against chemists, perfumers, mineral-water dealers and others, vendors of capsuled articles. A person in the employ of Mr. Betts went into a shop and bought there a single bottle, the cork of which was covered with a capsule bearing the name and address of the person who manufactured the article and affixed the capsule. The retailer, having bought and sold the article in the ordinary course of his trade in perfect innocence, then received a letter from Mr. Betts's solicitor, stating that he 'was instructed by Mr. Betts to commence proceedings for an infringement of his patent by the use and sale of his metallic capsules on bottles, which capsules had not been made by Mr. Betts, but of precisely similar materials.' The retailer replied, 'As I have never capsuled, or caused to be capsuled, any bottle or pot in my establishment, perhaps you will have the goodness to let me know in what way I have infringed the patent;' to which the answer was, 'I beg to state that the sale by you of the capsules on bottles is the infringement complained of. Any person supplying you is equally liable, and the time will come when you will be interrogated as to who has supplied you, when and in what quantities;' and on the same date the Bill was filed.

"Mr. Betts is very experienced in litigation; he was offered by Mr. Rimmel £1000 for peace, and refused it; and when an attempt at an arrangement was on foot he talked of £20,000 or £30,000 as something solid, something to eat, to be paid by the 'Pharmaceutical body' (how much more from other traders was not stated). Some of the defendants settled with Mr. Betts by paying £20 to £25 each; but it was felt that unless a stand was made Mr. Betts might go through the kingdom in detail, and, with sums of £20 or £25 apiece obtained from chemists, perfumers, wine merchants, grocers and others, fill his money-bags at the expense of legitimate traders, and also that success by Mr. Betts in that operation might encourage other patentees to pursue a similar line, and render business intolerable. Thus, a stand was resolved upon, a committee was formed, and a defence fund raised.

"Under cross-examination Mr. Betts did not recognize his own goods of English manufacture, and admitted having sundry manufactories *abroad;* and when it appeared likely that the capsules on the purchased bottles had been made by his Paris house, he set up a subtle distinction between Betts as a French manufacturer and (the same) Betts as an English patentee, so that the Vice-Chancellor said, 'I must say this seems to me about the most impudent case that ever came into Court. I am shocked at such a mode of making an affidavit. I hope never to see it again.'

"But Mr. Betts, 'the hero of a hundred fights,' will not sit down under the condemnatory judgment of the Vice-Chancellor. He appeals to the Lord Chancellor, and may resort to the House of Lords; and unless he is resolutely met, it is impossible to predict the result. The defence entails expenses which are, and will be, heavy; and we have to appeal, as we do with confidence, to the great body of retail and wholesale dealers to aid the object by a general subscription. Their protection from similar suits has, no doubt, been secured by the defence, as the patent has expired during the four years of litigation.

"It should be understood that the Defence Committee is not identified with, and has no claims upon the Pharmaceutical Society, though many of the leading members of the latter have taken an active interest in the object for which it has been formed.

"Contributions to the Defence Fund, in stamps, P. O. Orders, or cheques, crossed 'London and County Bank, may be paid to the Treasurer, Mr. Lionel Newbery, 44, St. Paul's Churchyard, London, E.C.

"Inclosed is a form for your Subscription, and we ask the favour of your filling it up and remitting it at your earliest convenience.

"For the Defence Committee,
"WILLIAM TEMPLE COOPER, *Chairman.*

"26, *Oxford Street, London, W.*"

The following gentlemen form the Defence Committee, who will furnish any required information:—

BARCLAY, ROBERT, Farringdon Street, E.C.
CARTEIGHE, MICHAEL, 172, New Bond Street, W.
COOPER, WM. TEMPLE, 26, Oxford Street, W.
ELLIS, GEORGE H., 4, Pavement, Finsbury, E.C.
FIELD, GEORGE, 168, Edgware Road, W.
HART, WALTER, 38, Blackman Street, S.E.
HILLS, THOS. HYDE, 338, Oxford Street, W.
HOVENDEN, ROBT., jun., 5, Great Marlborough St., W.
NEWBERY, LIONEL, 44, St. Paul's Churchyard, E.C.
POTTS, ROBERT N., 26, South Audley Street, W.
REDWOOD, THEOPHILUS, 17, Bloomsbury Square, W.C.
SANDFORD, GEORGE WEBB, 47, Piccadilly, W.
SANGER, WM. ALBERT, 150, Oxford Street, W.
SMITH, FRED. WM., 139, Newington Causeway, S.E.
WILLMOTT, WM., 83, High Street, Borough, S.E.

17, *Bloomsbury Square, London.*

"FREE TRADE IN SURGICAL INSTRUMENTS."

Sir,—May we be allowed to say a few words with reference to the article in your Journal of July 30th, in which our names appear?

In sending our catalogue of surgeons' instruments to the profession direct, we most certainly had no intention of injuring in any way our best customers, the chemists and druggists; indeed, apart from any better feeling, our own interest would have prevented our doing this.

We learnt from experience that the surgeons *would* buy their instruments direct, and in endeavouring to transact this branch of our business through the chemists we found we were seriously prejudicing ourselves without really serving them.

With regard to the few sundries included in the surgeons' price-current they were added simply to satisfy the profession without furnishing our general list, and we carefully excluded all articles that we thought could possibly interfere with the *chemists*. As, however, *they* think otherwise, in future we shall confine our surgeons' list strictly to surgeons' instruments and appliances.

We fear, owing to misconception, which we deeply regret, that we have been the subjects of some ill-feeling in certain quarters, but this we feel confident will disappear when our motives become better understood.

In the conduct of our business we have always scrupulously studied the benefits of the trade, even when to our own pecuniary loss.

Apologizing for troubling you on a matter which, although of a personal character, is of no little importance to us,

We are, Sir, yours obediently,
S. MAW, SON AND THOMPSON.

[*** We think it right to remind our readers that the article referred to by Messrs. Maw dealt with the obnoxious mode in which the case had been treated of in a contemporary rather than with the merits of that case, which is somewhat outside the range of this Journal.—ED. PH. J.]

Hospital Dispensing.

Sir,—This morning I was engaged in perusing the article in the Journal containing Mr. Simon's reflections (in his Report to the Lords of the Privy Council) upon the power which is vested in the Pharmaceutical Society to prescribe regulations as to the keeping of poisons not having been exercised by them, when I was interrupted by a female who asked for a seidlitz powder. This was a preliminary to the inquiry how she ought to take a mixture, or whether it was a gargle, that had just been supplied to her at the dispensary of St. Bartholomew's Hospital. She produced about O j of medicine without a label, but in its place a scrap of ungummed paper had been thrust into her hand, upon which was printed

"One teaspoonful every hours."

The medicine was prescribed by one of the officials connected with the hospital, and as far as the prescription could be deciphered from its scrawled and blotted condition, it was this—

"Hj Mist. Cinch. Rosæ c. Acid."
t.

I presume the *t* meant that it was to be taken three times a day, although a teaspoonful dose would be quite homœopathic. I tasted it, and told the patient that undoubtedly the medicine was nothing very potent, especially as it had been compounded at an establishment that did not incur the trifling expense of using adhesive labels.

Coupled with the podophyllin prescription supplied by a correspondent last week, does not this exhibit great laxness on the part of the profession compared with the care and attention displayed in most retail dispensing establishments? Ought not Mr. Simon's strictures in common fairness to be applied rather to the dispensaries for the poor than to the dispensing chemist who, for his own interest, is careful to place explicit directions upon adhesive labels, and attach them to any medicine he dispenses?

I am, Sir, yours, etc.,
Robert Owen Fitch, M.P.S. G.B.

Sir,—I have not had the pleasure of seeing the article in the *Lancet* from which you quoted last week, but, judging from the choice little specimen, feel persuaded that the editor, if not suffering from nervous irritability, must have been inhaling that gas that makes people feel "jolly under difficulties," as did Mark Tapley when reduced to his worst condition in the flourishing estate of Eden.

General practitioners, who are everything in general and nothing in particular, do sometimes assume airs of importance that suffer an eclipse when brought in close proximity with educated pharmacists, whose labours they are not so unwilling to profit by as to acknowledge.

The head and front of their offending is not therefore ignorance so much as being competitors in the healing art. They spoil practice, and many a profitable case is entirely frustrated by the timely dose that *saves* the doctor.

General practitioners must sometimes find their cloth wofully soiled by contact with inferior people at the Polytechnic and elsewhere,—even at church, which does not exclude greasy butchers, dusty millers, musty pawnbrokers or unctuous grocers when properly dressed for the occasion. Above all, these gentlemen have no objection to take pay from the disreputable class who "prescribe (*not*) in the dark," like some shady practitioners of questionable antecedents, in their "hideous dens of iniquity," as designated by the *Times* not many years since.

I hope sufficient spirit will be found among us to assert our claims on public confidence and respect, and that the depletory influence of that very old-fashioned and almost obsolete instrument, the *Lancet*, will not succeed in taking one drop of blood from our body corporate.

I am, Sir, yours faithfully,
Non-Malefactor.

Mr. Coles' Prescription.

Sir,—Respecting Mr. Coles' Prescription in Journal of the 3rd inst., I should have used the *Acid. Nit. Mur.* Dil. in the mixture; and the pills I would have made *into* twelve, knowing, verbally or otherwise, something of the patient; and the *Directions ij p.* r. *n.* Certainly the pills would be powerful, but I should consider perfectly safe.

I am, Sir, yours faithfully,
R. Parkinson.

1, *William Henry Street, Liverpool,*
September 6, 1870.

As Mr. Coles is desirous of an expression of opinion from any member of the Profession as to how the two formulæ he has given ought to be dispensed, I readily offer mine. At first glance, both appear to be unusually strong, while the pill formula is incomplete as to directions for the number of pills intended to be made from the *materiæ* ordered.

In my experience I have frequently met with instances where medical men have given such decided doses of the very same medicines, and I will refer him with pleasure to two who are constantly writing such prescriptions as he has given. From the *adjuvans* ordered in the latter of the formulæ, it appears to have been evidently the intention of the prescribers to exhibit a brisk cathartic to counteract the constipating effect of the acid when given in so large a dose; but then comes the question, how many pills were intended? From that quantity of the materiæ I should have made it into thirty, and directed two to be taken every night.

I can remember a case in my early dispensing days of a man who regularly took one grain of podophyllin combined with colocynth and extract of henbane every night with but little intermission for months, and with apparent ease as well as benefit to his health.

However, if opportunity offered, I should certainly inquire into the case before delivering the medicine to my customers.

Peltatum.

Concentrated Medicine.

A correspondent inquires how to dispense the following:—

R. Ferri Pot. Tart. ʒiij
Amm. Carbonat. ℈iss
Tinct. Aurantii,
Inf. Calumb. Conc. āā ℥iss
Misce.

M. T. (Hampstead) is referred to the Erratum below, and to No. 4, p. 68, where there is a note on the subject.

G. E. C. Brown (Louth) writes to say that he has had several pigeons poisoned by perchloride of mercury, and wishes to be informed in the columns of the Journal whether it would be safe to eat them.

A. B. (Hertford) writes, in reference to the plate licence for smelling-bottles, stating that "silver-capped bottles are exempt if under 5 dwts., gold-capped bottles are exempt if under 2 dwts. of metal." We thank him for this information, which we publish on his authority. It has not been the practice to answer legal questions in this Journal.

September (London) desires to have a formula for Brilliantine. We must refer to the rule as to anonymous letters.

Mr. Francis Bell (Bradford) writes to say that he has forwarded to the German Committee in that town 12 yards of adhesive plaster, 2 lbs. of lint, 6 bottles of Condy's fluid and 1 oz. bottle of Howard's quinine.

H. E. D. (Wallingford) wishes to know whether any better work can be recommended for following in collecting an herbarium than Babington's 'Manual of British Botany' (Van Voorst, 10*s.* 6*d.*) or Hooker's 'Student's Flora' (Macmillan and Co., 10*s.* 6*d.*).

C. W. K. (Thorne).—The exemption is granted to Pharmaceutical Chemists only.

X. Y. Z. asks whether the duty is taken off hops; whether brewers are allowed to substitute any other bitter in making bitter beer and, if so, whether chemists are allowed to sell it to them. We must call our correspondent's attention to the rule given above respecting anonymous communications.

Erratum.—In the answer to *X. Y.*, p. 180, col. 2, line 26 from top, *for* weaker *read* stronger.

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

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GUARANA.

Paullinia sorbilis, Mart.

BY M. C. COOKE, M.A.

The remarkable product called Guarana has not been many years known in Europe. The tree whence it is obtained belongs to the Order *Sapindaceæ*, and is abundant in the province of Amazonas, along the banks of the Tapajos, Rio Negro, etc., as well as in Guiana and Venezuela. The fruit, scarcely as large as a walnut, contains five or six seeds, which are roasted, then mixed with water, and moulded into a cylindrical form resembling a large sausage, then finally dried in an oven and offered for sale. Guarana is used extensively in Brazil, Guatemala, Costa Rica and other parts of South America, as a nervous stimulant and restorative.

Besides its medicinal properties, this substance has a reputation for affording a refreshing beverage similar in its effects to tea and coffee. It is grated into a powder, very like powdered cacao in appearance. Two spoonfuls of this powder are mixed in a tumbler of water, and this drink is regarded as a stimulant to the nerves, and, like strong tea or coffee, is said to take away the disposition to sleep.

The active chemical principle is an alkaloid first discovered by Dr. Theodore von Martius, and called by him Guaranine, but since shown by Dr. Stenhouse to be identical with Theine. Guarana contains more than double as much of this alkaloid as good black tea, and five times as much as coffee, the proportions being 5·07 per cent. in Guarana, 2·13 per cent. in tea, and 0·80 to 1·00 in coffee.* The same alkaloid is found to the amount of 1·25 per cent. in matè, or Paraguay tea, the produce of several species of *Ilex*.

It is rather a singular coincidence that the same alkaloid should prevail in all the principal substances employed in a a similar manner as beverages in different parts of the world,—in the tea of China and India, the coffee of Arabia, the cacao of Central America, the matè of South America, and the Guarana of Brazil. M. Fournier has found in the last-named substance, besides tannate of caffein, the following principles:—gum, starch, an acrid green fixed oil, a concrete volatile oil, scarcely soluble in water, a peculiar principle not precisely determined, and tannic acid.†

According to the 'Technologist,' there is exported annually from the city of Santarem about 16,000 lbs. of this substance, valued at eightpence or ninepence per pound, and on the Rio Negro it has been sold as low as one penny per pound. Specimens were exhibited in the Brazilian Court of the International Exhibition of 1862, made by the Amazonian Indians, who prepare it for their own use, and for conveyance to Para, Matto Grosso, and Goyaz. Six different preparations made in Vienna from this substance were also shown in the Austrian Court.

When Guarana was first employed in France medicinally, it sold at the rate of from four shillings to twenty shillings per ounce, but has since gone down in price. It is included amongst the non-officinal substances of the 'United States Dispensatory.'

Its effects upon the system are said to be those of a tonic, but they do not appear to have been accurately investigated. It is habitually employed by the Indians of Brazil, either mixed with articles of diet as with cassava or chocolate, or in the form of drink, prepared by scraping it, and suspending the powder in sweetened water. It is considered by them useful in the prevention and cure of bowel complaints. Dr. Gavrelle, who was formerly physician to Dom Pedro in Brazil, called the attention of the profession to it some years since in France. He had found it advantageous in the diarrhœa of phthisis, sick headache, paralysis, tedious convalescence, and generally as a tonic. By Dr. Ritchie, surgeon in the British Navy, it is highly recommended in irritation of the urinary passages.* Dr. Hervé has been in the habit of using it daily for five or six years, and has never failed to derive advantage from it in idiopathic diarrhœa, even in the most obstinate cases.†

It may be given in substance, in the quantity of one or two drachms, scraped into powder, and mixed with sweetened water, but the most convenient form of administration is that of spirituous extract. According to M. Dechastelus, alcohol is the only agent which completely extracts its virtues, ether and water effecting this object but partially. Of the extract eight or ten grains may be given during the day, in the form of pill. It may also be taken along with chocolate as a drink.‡

Another species of *Paullinia* (*P. cupana*) growing on the banks of the Orinoco river, is also said to yield a similar substance. Guarana, or Paullinia, as it is sometimes called, has never obtained general favour in this country.

* For an account of Dr. Stenhouse's researches, see Pharm. Journ. 1st ser. Vol. XVI. p. 212.

† *Journ. de Pharm*, April 1861, p. 291.

* Ed. *Month. Journ. Med. Sc.* N.S. v. p. 467.

† *Brit. and For. Med. Chir. Rev.*, Jan. 1858, p. 192.

‡ United States Dispensatory,' 12th ed. p. 1578.

THE SOURCE OF MUSCULAR POWER.

BY BARON LIEBIG.

Considering muscle as the working apparatus and source of power in the animal body, a knowledge of its chemical composition acquires great interest; but unfortunately we know very much less of this than of its morphological relations.

We distinguish in muscle constituents with definite forms from others that are amorphous; and one-seventh part of the dry material of muscle consists of soluble substances which do not coagulate when heated. These constitute the so-called extractive, that is taken up from disintegrated muscle by cold water.

Urea and uric acid do not exist in healthy muscle; uric acid has only once been met with by Meissner in fowls' flesh, and in very small amount—a few milligrams in nine pounds of flesh.

The mere fact of the invariable presence of creatin or creatinin in the muscular flesh of all the higher classes of animals may be regarded as decisive proof in favour of the opinion that both these substances are necessary for the economy of muscle.

Some physiologists have regarded them as appertaining to excretions, especially because creatinin is frequently present in urine.

Creatin is, in virtue of its chemical characteristics, a substance that is unique; under the influence of very feeble reactions,—such, for instance, as in a fermenting sugar solution,§—it is converted into a

§ Pharm. Journ. 3rd ser. Vol. I. p. 142.

very strong alkaline base, and then again into a neutral substance solely by losing or taking up water, and without the aid of acids when neutralization takes place. A substance possessing such remarkable characters must surely be of some importance for the processes taking place in the force-producing apparatus.

However, there can be no doubt that, in some part, these substances are given off by the system; but I believe it is going too far to infer, from their presence in urine, that they have not taken part in the processes going on in the muscles. The organic alkalies, to which class creatinin belongs, are compounds of a peculiar and very stable kind; and every one would hold it to be inadmissible that quinine should be regarded as without influence in the process of the body, simply because it was present in the urine.

Inosinic acid is, according to the most recent observations of Seekamp, a constant constituent of ox-flesh and probably of all flesh. This is also the case with hypoxanthin.

The uncrystallizable nitrogenous constituents of muscular flesh, which quantitatively preponderate, are almost unknown as regards their chemical nature; among those which are non-nitrogenous there is one substance readily susceptible of conversion into lactic acid, perhaps sugar or inosite, which is present in larger amount in the muscles of the heart.

From what has already been said, it follows that myosin or syntonin, albumen tissues, nerve substance and phosphates do not alone make up muscle, but that the other combustible substances, so remarkable in their chemical nature, must be regarded as equally essential constituents. All together take part in the processes of the working muscle, and they must be considered as conditions of those processes.

There is scarcely an inference, much less a fact, that requires no further foundation; and if the formed muscle constituents be regarded as the parts of the machine, the other mobile constituents of the muscle must serve as the working material.

From this point of view, I believe we obtain a wider conception of the processes of nutrition, which, up to the present, are known only in the most superficial manner; while the difference between these processes in carnivorous and herbivorous animals becomes clearer.

Plants produce the albuminates which the herbivorous animal works up into muscular flesh; while carnivorous animals live upon the flesh of the herbivora; the organism of the carnivorous animal is not incapable of producing albuminates from plants, but, as regards its maintenance and development, it is not adapted for the working up of plant albuminates into flesh.

The organism of the herbivorous animal possesses, in virtue of its peculiar arrangement, the capability of working up its fodder and converting it into part of its body.

The carnivorous animal is wholly destitute of this capacity; its body is not adapted for working up vegetable food, as it is presented naturally.

It is impossible to nourish a carnivorous animal with peas, corn or grass; the animal does not eat these materials, nor can it become used to them; its masticatory apparatus is adapted for tearing and devouring, not for chewing; the meat food the animal is supplied with requires no chewing in order to become assimilable.

By the art of man it is possible to make up for one of these deficiencies, but not for all of them, though some kinds of vegetable food may be made serviceable for carnivorous animals, as, for instance, by converting corn into meal; thus, domesticated carnivorous animals may be nourished with bread or meal in the form of porridge, dumplings, etc., with or without the addition of fat.

The nutrition of carnivora with such prepared vegetable food is always imperfect; the animals consume a large quantity, but their digestive apparatus is not suited for dealing with the large quantity that would be requisite for satisfying the animals' wants within a given time.

The conversion of plant-albuminates into flesh, into the apparatus by which an animal produces its power and heat, and the digestion of starch, subjects its body to working exercise which it is spared when feeding on its usual diet. A greater part of the total of the animal's internal force is expended in the working up of these materials; it loses its wildness, and approximates in character to an herbivorous animal. Therefore a carnivorous animal is scarcely suitable as a subject for experiments intended for the accurate determination of nutrition processes.

On the other hand, the working organs of the herbivora, their chewing apparatus and digestive organs, are not only adapted for the subdivision, but also for receiving large masses of vegetable fodder; in our specially flesh-producing domestic animals nearly the whole of the available force in the body is expended upon this internal work. Besides the carrying and motion of their bodies, these animals do no external work; whatever external work they are compelled to do is lost for their internal work of flesh-production.

Comparing flesh with albuminates the difference between them is immediately evident. Fresh lean muscular flesh (beef) contains:—

Fat and Lactic Acid of Flesh	1·18	24·12
Syntonin, Albumen of Flesh	18·00	
Tissue, Vessels and Nerves	1·50	
Combustible Soluble Material (extractive)	2·64	
Soluble Salts	0·66	
Insoluble Phosphates	0·14	
Water		75·88

The plant-albuminates which serve in the body of an herbivorous animal for the production of its flesh, are chemically identical with the syntonin and albumen of flesh; the tissues and vessels differ far more in their composition from albuminates, and most of all the combustible soluble constituents of muscle.

Hence it is evident that while the conversion of plant-albuminates into flesh-albuminates requires the least expenditure of internal work, the production of the soluble constituents of muscle requires the greatest amount of internal work, and since this is connected with the consumption of material, the animals require for the maintenance or increase of their body-weight a larger amount of albuminates.

In the living organism the laws that obtain in nature generally are also in full force, and thus the character of the fodder has the greatest influence upon the external working capabilities of the animal.

In appreciating and applying these conditions, art is as usual in advance of science, certainly without being able to afford any explanation of the facts they are familiar with, for this is not the province of art.

The feeders of cattle distinguish fodder that produces power from ordinary fodder. Of the former kind are the seeds of cereals and *Leguminosæ*, which are richest in albuminates and starch, the most easly digested vegetable food; they require less internal work, and much less time for digestion in the stomachs of the animals and for their transfer into the circulation, than is required by the nutritive material of grass or hay; and it is well known what a considerable influence is exercised on the vigour of a horse by the addition of oats to hay-fodder, or on the production of flesh in oxen and pigs by beans or peas.

Whatever internal work the animal is relieved of in one direction becomes available in another direction.

Just the same laws obtain for man who combines the peculiarities of both the herbivora and the carnivora.

There are large classes of society, whole nations of people, who live exclusively on vegetable food and possess the full working capacity of working animals, but man, on the whole cannot dispense with meat when engaged in a higher order of work.

This is the case in a special degree for the labour of the brain or intellectual work which the animal has not to perform. This involves as great, and perhaps much greater expenditure of internal force as mechanical work by the limbs. For the maintenance of such work an artificially prepared food is of especial utility to a man, and every one knows that when his digestive organs come into conflict with his food the capacity for either intellectual and bodily work is thereby reduced. The food must be of such a character that the work of digestion and various other kinds of internal work shall not be interfered with. The mere prevention of sleep in consequence of eating indigestible food will, in this respect, produce a difference.

It is also intelligible that for a carnivorous animal a certain weight of albuminates eaten in the form of bread cannot be equal to the same weight of albuminates in its flesh-diet, in which the albuminates are taken, not only in a concentrated form most suitable to the capacity and power of exercise of the digestive organs, but at the same time meat supplies all the constituents of the muscular juices. In the case of a carnivorous animal the food taken requires a minimum of internal work for the reconversion of its constituents into muscular apparatus capable of exertion and for making them serviceable for the other requirements of the body.

The conversion of a part of the plant-albuminate into the soluble constituents of muscle would require in the animal's body a certain amount of work, that it would be relieved of almost entirely when the albuminate was supplied as meat.*

* This will perhaps account for the remarkable fact observed by Bischoff and Voit with the dog as regards the increase of body-weight under meat diet.

A dog that had been reduced by feeding it on bread, and of 34 kilograms weight, was then fed with 1800 grams of meat, and, on the first day, it gained 600 grams. One-third of the meat eaten remained in the dog's body and increased its weight $\frac{1}{58}$th.

On the contrary, in feeding oxen, the rule is that for the increase in body-weight of 1 pound (= 125 grm. dry), from four to six times as much albuminates must be supplied in the food; a tolerably sure indication how much more work and material is expended by the herbivorous animal in producing flesh.

In roasting and boiling meat, the flesh albuminates coagulate, the soluble constituents of muscle pass into the liquid which is retained almost entirely, in the case of roast meat, within it as in a sponge. Physiologists have made the remarkable observation that flesh albuminates, when coagulated by heat and sufficiently subdivided by mastication, are more soluble, or, as this is generally expressed, more digestible than they are in the raw state. Both raw and cooked albuminates are converted in the stomach into one and the same product, peptone, while the most general experience shows that roast meat, as well as boiled meat eaten with the broth in which it has been boiled, possesses the same nutritive value as the raw meat that a carnivorous animal eats. Consequently the soluble constituents of muscle in cooked meat must perform the same duty in the human organism as they do in the organism of the carnivora.

The organs of digestion have the greatest bulk of all the organs of the body; next to the heart and breathing muscles, they have the most severe interior work to perform. A muscular apparatus of considerable development works for hours in order to set in motion the relatively heavy mass of food and to affect the intermixture of all its parts with the secreted juices of the stomach, so that it is easy to understand how the force which those muscles expend must be derived chiefly from the muscles of voluntary motion, and hence it is that rest of the body is one of the conditions of active digestion.*

The influence of indigestible food or of a disturbance of the digestion upon the activity of all the organs in the body, upon the mechanical work of the limbs, the work of the brain and upon sleep is sufficiently well known. It is evident that food which is difficult to digest requires a longer time, while easily-digestible food requires a shorter time for its digestion, and that the time must be proportionate to the work to be performed; the shorter the time of digestion the more force is economized, and of course reserved for other organs. From this point of view, viz. economy of working power, the art of preparing food for men as well as for animals acquires a high significance.

"Soup and porridge," says Hippocrates, "were invented because experience taught men that the food which suits healthy people is not applicable for the sick."

I have already mentioned the remarkable result that is attained by a simple mechanical subdivision of certain kinds of vegetable food in regard to their digestion in the stomach of a carnivorous animal; it spares the animal the work of chewing and enhances the digestibility of the food. Probably by boiling meal to porridge, by the conversion of starch into dextrin and sugar, together with the addition of proper condiments, etc., the nutritive value of the food may be yet further augmented for the animal.

For man especially, the proper selection and preparation of his food are of vast importance for the development and exercise of all his powers.

* The influence of different kinds of working apparatus upon each other is easily intelligible if we think of what takes place in a factory whereby a single steam engine, or by the available power, several machines are kept at work; for example, a hammer and a rolling-mill at the same time. When the rolls are in full work, the hammer does but little, and when the hammer is being worked, only thin plates can be rolled.

Bread such as is commonly eaten, may be in a certain sense compared to the hay with which a horse is fed; but it is known that when a horse is fed with hay alone, all its capabilities are not fully developed.

It is only necessary to compare the performances of German workmen, who consume bread and potatoes chiefly, with those of English and American workmen who eat meat, in order to acquire a clear perception of the degree in which the magnitude, energy and duration of the work done by the latter are augmented by the kind of food they live upon. Again, compare the English statesman who, in expounding his views or maintaining a debate in Parliament delivers a speech lasting five hours or more, who at sixty years of age retains the capability of taking part in field sports, with the German philosopher who at the same age keeps up with difficulty the remains of his powers in order to be capable of work, while he becomes fatigued by a walk of a few hours.

For considerable and long-continued intellectual or bodily exertion it is necessary to have not only good organs of digestion, it is equally necessary that there should be a proper selection of food, which should be of such a character that the smallest possible portion of its available force may be required for the full production of its action in the body, so that there may be the more of that force remaining disposable at the will of the individual.

A knowledge of the conditions most proper for nutrition with a view to the performance of work is therefore most of all requisite in reference to man. We must endeavour to obtain very different means of judging as to these conditions now that we know urea is not either a measure of the work done, or exclusively a measure of the increase or decrease of the body during rest or work, as Dr. Parke's observations show.

WHAT IS ENERGY?

BY BALFOUR STEWART.

III.—THE CONSERVATION OF ENERGY.

It is well known that certain organisms of the animal world do not confine themselves to one state of being or to one order of existence, and the most familiar instance of this roving habit of life is the caterpillar, which passes first into the chrysalis state, and after that into the butterfly. This habit is not, however, peculiar to the organic world, for energy delights in similar transmutations, and we have just seen how the eminently silent and invisible electrical current may occasionally be transmuted into the vivid, instantaneous, awe-inspiring flash of lightning. Nor is this element of change confined to our peculiar corner of the universe, but it extends itself to remote starry systems, in some of which there is a total extinction of luminosity for a while, to be succeeded by a most brilliant luminous outburst, presenting all the appearance of a world on fire.

We shall not enter here into great detail regarding the various changes of energy from one form into another; suffice it to say, that amid all these changes of form, and sometimes of quality, the element of *quantity* remains the same. Those of our readers who are mathematicians know what is meant by variable quantities; for instance, in the equation $x + y + z = A$, if x, y, and z are variable and A constant, you may change x into y and into z, and y into x and into z, and in fact perform any changes you choose upon the left-hand side of your equation, *provided that* you keep their sum always constant and equal to A. It is precisely thus in the world of energy; and the invariability of the sum of all the energies of the universe forms the doctrine known as the "conservation of energy." This doctrine is nothing else than an intelligent and scientific denial of the chimera of perpetual motion.

Recognizing the great importance of work, it was natural enough at an early stage of our knowledge that enthusiasts should endeavour to create energy or the power of doing work, that is to say, endeavour to construct a machine that should go on working for ever without needing to be supplied with fuel in any way, and accordingly inventors became possessed with the idea that some elaborate system of machinery would, no doubt, give us this grand desideratum, and men of science have been continually annoyed with these projects until, in a moment of inspiration, they conceived the doctrine of the conservation of energy.

It flows from this doctrine that a machine is merely an instrument which is supplied with energy in one form, and which converts it into another and more convenient form according to the law of the machine.

We shall now proceed to trace the progress of energy through some of its most important transformations. To begin with that one to which we have already alluded, what becomes of the energy of a falling body after it strikes the earth? This question may be varied in a great number of ways. We may ask, for instance, what becomes of the energy of a railway-train when it is stopped? what becomes of the energy of a hammer after it has struck the anvil? of a cannon-ball after it has struck the target? and so on.

In all these varieties we see that either percussion or friction is at work: thus, it is friction that stops a railway-train, and it is percussion that stops the motion of a falling stone or of a falling hammer, so that our question is, in reality, what becomes of the energy of visible motion when it has been stopped by percussion or friction?

Rumford and Davy were the pioneers in replying to this important question. Rumford found that in the process of boring cannon the heat generated was sometimes so great as to boil water, and he supposed that work was changed into heat in the process of boring. Davy again melted two pieces of ice by causing them to rub against each other, and he likewise concluded that the work spent on this process had been converted into heat.

We see now why by hammering a coin on an anvil we can heat it very greatly, or why on a dark night the sparks are seen to fly out from the break-wheel which stops the motion of the railway-train, or why by rubbing a metal button violently backwards and forwards against a piece of wood we can render it so hot as to scorch our hand, for in all these cases it is the energy of visible motion which is being converted into heat.

But although this was known nearly a century ago, it was reserved for Joule, an English philosopher of the present day, to point out the numerical relation subsisting between that species of energy which we call visible motion and that which we call heat.

The result of his numerous and laborious experiments was, that if a pound of water be dropped from a height of 772 feet under the influence of gravity, and if the velocity which it attains be suddenly stopped and converted into heat, this heat will be sufficient to raise the whole mass 1° F. in temperature.

From this he concluded that when a pound of water is heated 1° F. in temperature, an amount of molecular energy enters into the water which is equivalent to 772 foot-pounds, that is to say, to one pound raised 772 feet high against the influence of gravity, or allowed to fall 772 feet under the same influence.

He found again that if a pound of water were to fall twice this distance, or 1544 feet under gravity, the velocity if stopped would raise its temperature 2° F., and in fact that the rise of temperature under such circumstances is proportional to the height from which the pound of water is supposed to fall. By this means an exact relation is established between heat and work. Grove was the first to point out the probability of a connection between the various species of molecular energy; and the researches of Joule, Thomson, and others have established these relations with numerical accuracy. No better example of the correlation of the various kinds of energy can be given than what takes place in a galvanic battery. Let us suppose that zinc is the metal used. Here the source of energy is the burning or chemical combination of the zinc with oxygen, etc., in order to form a salt of zinc. The source of energy is, in fact, much the same as when coal is burned; it is the energy produced by chemical combination. Now, as we have said, the zinc combines with the oxygen and sulphate of zinc is produced, but the result of this combination does not at first exhibit itself in the form of heat, but rather in that of an electric current. No doubt a great portion of the energy of this electric current is ultimately spent in heat, but we may, if we choose, spend part in promoting chemical decomposition; for instance, we may decompose water. In this case part of the energy of the battery, derived, as has been stated, from the burning of the zinc, is spent in heat and part in decomposing the water, and hence we shall have less heat than if there were no water to decompose. But if, when we have decomposed the water, we mix together the two gases hydrogen and oxygen which are the results of this decomposition and explode them, we shall recover the precise deficiency of heat. Without the decomposition, let us say that the burning in the battery of a certain weight of zinc gives us heat equal to 100, but with the decomposition only 80, twenty units of energy have therefore become spent in the decomposition; but if we explode the mixture of gases procured from the decomposition, we shall get back heat equal to 20, and thus make the whole result of the burning of the zinc 100 units of energy as before.

In like manner, if our electric battery is made to do work, thus forming a kind of engine, we shall have the heat produced by the current diminished by the exact equivalent of the mechanical effect which we have obtained from this engine.

There is nothing for nothing in the universe of energy.

CONDY'S PATENT FLUIDS.

The extremely powerful oxidizing properties possessed by the manganates and permanganates have been well known, and have frequently been made use of in the laboratory of the chemist for a considerable time past. The merit, however, of introducing these salts to the general public as most valuable deodorizers and purifiers belongs, we believe, to Mr. Condy. But though the initiative in establishing their manufacture on a large scale thus belongs to Mr. Condy, he seems to have allowed himself to be outstripped in their economical production. In the following table will be found the strength of three kinds of Condy's patent fluids as sold in London, measured by their oxidizing power in comparison to pure permanganate of potash.

For a due appreciation of the table, it is necessary to bear in mind that the crystallized permanganate used for comparison is a chemically pure article, while Condy's fluids Nos. I. and II. are solutions of the impure crude article, and that even the ozonized water does not contain the absolutely pure salt. With these explanations the table will speak for itself.

1	2	3	4	5	6
Description of Article.	Price retail in London.	Total solid contents in 100 parts.	Amount of Permanganate of Potash equal in oxidizing power to 100 parts.	Quantity equal in oxidizing power to one ounce Permanganate.	Price of the quantity given in column 5 as equivalent to one ounce Permanganate of Potash.
					£. s. d.
No. I.—Green Fluid	5*d.* per 7½℥	13·76	1·781	56·14℥	0 3 7
	5*s.* per gall.	13·76	1·781	56·14	0 1 9
No. II.—Red Fluid	11*d.* per 7½℥	8·40	1·786	55·99	0 6 10
	10*s.* per gall.	8·40	1·786	55·99	0 3 6
No. III.—Ozonized Water . .	1*s.* 8*d.* per 4℥	0·245	0·224	447·4	9 6 5
	3*s.* per 8℥	0·245	0·224	447·4	8 7 9
Pure crystallized Permanganate of Potassium	2*s.* per 1℥	100	100	1℥	0 2 0

Particulars of Samples Analysed.

No. I. *Condy's Patent Fluid* (*green solution*).—Contained in a glass bottle holding 7½℥; sold retail at 6*d.* per bottle, being about 5*d.* per 7½℥ contents. The bottle was wrapped in pale buff-coloured paper, nearly covered by two large labels with green print. The cork was secured by a strip of label, on which was printed "Condy's Patent Fluid. For destroying all offensive odours. Will not stain when diluted."

No. II. *Condy's Patent Fluid* (*red solution*).—In a glass bottle holding 7½℥; sold retail at 1*s.* per bottle, being about 11*d.* for the contents. The wrapper was buff-coloured, nearly covered by two labels with red print. The cork was secured by a strip of label, on which was printed the trade mark (a triangle enclosing a Θ surrounded by "Trade Mark—Condy"); the French and English prize medals; and in two circular spaces on one side, "Condy's Fluid. Does not stain when diluted;" on the other side, "Natural Disinfectant. N.B. The cork in each bottle of Condy's fluid is secured by a strip identical with this."

No. III. *Condy's Patent Ozonized Water for Toilet Purposes.*—In a small stoppered bottle holding 4℥, retail price 2*s.*, leaving about 1*s.* 8*d.* as the price of the contents. The bottle is nearly half covered by a label, on which are printed directions for use, prize medals, etc.; nearly the whole label being covered by trade marks arranged in a pattern as a groundwork.

The active agent in No. I. is chiefly the manganate of soda, though in the table its effect is measured against its equivalent of permanganate. In Nos. II. and III. the active agent is chiefly the permanganate of soda, though they contain also some potash. They have also been compared to permanganate of potash.

The crystallized permanganate of potash used for comparison was bought retail for 2*s.* the ounce. It was in fine crystals, contained no soda, and its oxidizing power, as measured by pure oxalic acid, was exactly equal to 100 per cent. of permanganate of potash. It was, therefore, chemically pure.

PAYTINE.

Hesse gives this name to an alkaloid he has obtained from the white cinchona of Payta. The powdered bark is first extracted with alcohol; the residue left after distilling off the alcohol is mixed with caustic soda and shaken with ether. To the ether solution dilute sulphuric acid is added, and, after neutralizing the excess of acid with ammonia, the base is precipitated by iodide of potassium. The iodide of paytine is again decomposed by soda, and the liquid, shaken with ether, gives a solution which, on evaporation, deposits fine crystals of paytine. The composition of this base is represented by the formula $C_{21}H_{24}N_2O + H_2O$. It is soluble in benzol, ether, chloroform, petroleum and alcohol; slightly soluble in water; it melts at 156° C.

The hydrochlorate, $C_{21}H_{24}N_2OHCl$, forms colourless prisms soluble in 16·6 parts of water at 15° C. It has a very bitter taste, and does appear to be poisonous. The chloroplatinate is a yellow amorphous precipitate.

When distilled with lime, paytine yields a non-nitrogenous product, which the author calls paytone, as colourless plates or needles soluble in ether and alcohol. It does not combine with acids or bases.—*German Chemical Society.*

GINGILIE OIL.

The gingilie (*Sesamum Indicum*) is said to be an African plant, and is supposed to have been introduced to the West Indies by the negroes. It is now pretty generally distributed, and in this country it thrives admirably in the Newera Kalawyia district. The plant is cultivated for the seed, which yields a fixed oil. The method adopted in Ceylon of expressing the oil is rather primitive, and consequently it possesses an unpleasant flavour and a brown muddy colour. If properly prepared, the oil would form a very good substitute for sweet oil. The best method of preparing the oil is as follows.—First steep the seeds repeatedly in cold water, or boil them for a short time, till they are divested of the reddish-brown colouring matter contained in the epidermis of the seeds, then, when the seeds have become perfectly white, dry them in the sun, and express the oil in the ordinary way. The seed yields from 40 to 44 per cent. of a pale straw-coloured oil. When thus prepared, the oil is perfectly devoid of smell and may be used for extracting the perfume of the jasmine, tuberose, camomile and yellow rose. To effect this, one weight of the flowers should be added to three weights of the oil in a bottle, which should be corked and left in the sun for forty days, when the oil will be impregnated with the perfume of the flowers. The gingilie oil is soluble in alcohol, saponifies with alkalies, solidifies by nitric acid, and combines with the oxide of lead. The gingilie oil is highly esteemed by Egyptian belles for its properties of cleansing the skin and of imparting to it a bloom and lustre, and also of preserving the beauty and gloss of the hair. In Ceylon it is used for similar purposes. The negroes also use the seeds for making a sort of beverage something like coffee, by roasting the seeds and infusing them in water. The commercial value of the oil in England is £40 per ton.—*Jaffna News.*

A Gigantic African Mushroom.—Dr. Welwitsch, in his travels in Africa, met with a number of cryptogamic plants; among them a gigantic agaric, distinguished by the immense size of its head, sometimes measuring more than three feet in circumference, as well as by the delicate flavour of its flesh. It appears that on a botanical expedition in a district called Calungembo, near Pungo-Andongo, his provisions began to run short, and towards the close of a day's ramble he came upon some of his men carrying one of these enormous mushrooms home to camp for supper. He had not himself previously met with it, but the natives had; and the short commons on which they found themselves had sharpened their eyes and led to their picking it up. Some idea of the size of this specimen may be formed from the fact that that single mushroom made soup sufficient to feed his party of twenty. It was as large as an umbrella. Subsequently he met with it repeatedly, and also found that it was familiar to all the inhabitants, a few being regularly, or rather irregularly, brought to market during the season, at the Præsidium of Pongo-Andongo, where they were sold at 1*d.* to 3*d.* apiece, according to size. The natives usually brought them, one or two hanging at each end of a stick, carried Chinese fashion over the shoulder. It is a true agaric, as yet undescribed.—*The Food Journal.*

The Food of Infants.—Dr. C. A. Coudereau expresses himself in opposition to the generally received opinion that the milk of a wet-nurse is the best substitute for that of the mother when the latter cannot be obtained. He has found in the milk of many wet-nurses, dependent on their want of cleanliness, a peculiar fungus, which will develop under favourable circumstances in every other kind of milk, giving to such milk a peculiar odour, and discoverable in the evacuations of the child. In regard to artificial food, he rejects also beef-tea, as well as Liebig's extract of meat, but recommends a fluid into the composition of which eggs enter largely. He considers that a very nourishing and wholesome kind of drink can be obtained from eight eggs, white and yolk together, beaten up with about two ounces of sugar and enough water to make a pint and a half of fluid. To this he adds a small quantity of lime-water, sulphate of potash and chloride of sodium. With a fluid so composed he has obtained excellent results.—*Wiener Medizinischen Wochenschrift.*

Chilblains.—M. W. E. Schaller says that the fluid concentrated chloride of iron is an unfailing remedy for chilblains, its application to them for a single day effecting a cure. It may also be used with advantage for frost-bites.—*Wiener Medizinischen Wochenschrift.*

Gastric Juice.—Signor Arturo Menzel has published a considerable number of cases where gastric juice has been employed with advantage in cancerous tumours.—*Gazetta Medica Italiana Lombarda.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 17, 1870.

THE BRITISH PHARMACEUTICAL CONFERENCE.

The Seventh Annual Meeting has been a great success in every respect. After the PRESIDENT had delivered the admirable address published in another column, the reading of papers was continued until 4 o'clock, when the members adjourned to the Exhibition, where a number of objects interesting to pharmaceutists were collected and arranged in a manner that afforded great facilities for examination. We shall refer more particularly to some of these hereafter, but cannot now omit to mention the very excellent exhibits of Messrs. HOPKIN and WILLIAMS, Messrs. SOUTHALL, DYMOND and Co., and Messrs. MACFARLANE, comprising the new compounds of chloral, Indian drugs and alkaloids.

The dinner was well attended, and the presence of the PRESIDENT of the Society was heartily appreciated. One of the most interesting points was the transmission by telegraph of a message of greeting from the Conference to the Pharmaceutical Association now meeting at Baltimore, a reply being received from America the following morning.

At the meeting of the second day the discussion of the Education question was one of the main features of interest. Many members spoke, and though the discussion did not result in any practical suggestion, it was evident that much attention had been given to the subject.

It augured well for progress in British Pharmacy to hear the statement boldly put forward, and apparently assented to, that many druggists who take apprentices are either incompetent to give instruction requisite, or if they were competent to do so, did not take the trouble. At the same time great difference of opinion was expressed as to the way in which aid could best be given to promote the education of apprentices and assistants. In many cases, it was urged that the previous education, or want of education, rendered apprentices unfit for acquiring a knowledge of chemistry and other sciences, or availing themselves of the advantages within their reach. The most practical feature of the discussion was the reference to the Preliminary examination of the Society, and the proposal that the passing of this examination should invariably be required of all apprentices before they are received.

If this measure were generally adopted, no doubt a great advance would be made towards raising the future status of pharmacists.

Another suggestion, tending in the same direction, had reference to the propagation of the scientific training now given at the School of Pharmacy, by enabling the successful students of that School to employ themselves in teaching throughout the country. If this could be effected, there is reason to believe that the results would far surpass those attainable by any other means in many instance. At places where there are medical schools in existence, this might be superfluous if a course of pharmacy were given in connection with those schools, as at the University of Durham and at Newcastle. One main thing necessary in any step of this kind, is the suppression of cramming.

It was a matter of general regret that Mr. SCHACHT, who has taken so much interest in the subject of provincial education, was not present at the Conference; but, to judge from the general spirit evinced by those present, there is reason to hope that his efforts will find numerous supporters, and we trust that those who are able to put forward suggestions as to the means of promoting pharmaceutical education in the provinces will not fail to do so in the columns of this Journal. The means of aiding in this work may be more in the hands of the individual members of the trade than is generally believed. The judicious introduction of science into the educational training of the young is a measure that we hope to see realized before long, and if that be done in such a way as to substitute for mere teaching the education in scientific habits of thought, which would develope not only a capacity for appreciating natural facts but also a taste for scientific knowledge, it would be of vast benefit to the country at large and especially conducive to the elevation of Pharmacy, notwithstanding its frequent necessary connection with the trade element prevailing in the business of country places.

HOSPITAL DISPENSING.

Since we last referred to this subject in a few remarks which have attracted the attention of two of our medical contemporaries, another and a somewhat singular instance of accidental poisoning has occurred. An old woman, starting on a long railway journey, provided herself, as she thought, with her gin bottle, and, by way of being polite to her fellow-travellers, offered them a little alcoholic refreshment, which was accepted by two females, who, being strangers, of course, drank first. It was not until after they had each swallowed their dose that the liberal old lady, in taking her turn and applying a more appreciative palate, discovered that her new acquaintances had swallowed unknowingly a wine-glassful of a lotion meant for external use only. Their quiet absorption of this liquid speaks volumes for their politeness, and something also for the patient endurance with which the poor swallow very vile liquor, indeed with the hope of deriving some consolation from the consequent alcoholic exhilaration. Fortunately the train just then reached Slough, where, amid what is described as a scene of great excitement, salt and water emetics were successfully administered, so that no great harm seems to have been done.

The *British Medical Journal*, in commenting upon the case, and referring to our recent note on the subject, adds, "The accident gives room for thought. If the Pharmaceutical Society, whose function it is by Act of Parliament to devise rules for storing and dispensing substances, can offer any suggestion to our hospital authorities, they will certainly be favourably received, and carefully considered. There is in many instances much room for improvement."

The *Lancet*, however, in an article which not even the advent of the "silly season" can justify, appears to object to our statement as to "carelessness about bottles and labels too, at a great many hospitals," and adds, apparently in the way of refuting our remarks, that even the out-patient section of the imperfect work of the hospital system is an immense boon "to the sick and diseased poor." This certainly never was doubted; but it need not be balanced by unnecessary accidental poisoning of the class benefited, if that result can anyhow be prevented. The writer of this article also thinks our remarks "came with exceedingly bad grace from such a source," and he concludes by intimating in his not very exquisite language that the class of pharmaceutists are "malefactors." To reasoning so conclusive, and language so refined, we can only render the homage of silence. This is not the customary language of the profession to which a writer in the *Lancet* may be presumed to belong, and in the name of which he assumes to speak.

The general moral of the whole affair is to indicate, not only the desirability of poison regulations or precautions, but also to point out the difficulties which environ the subject, since precautions are subject to the disturbing influence of such extreme negligence and stupidity as are displayed in these latest examples of accidental poisoning. However, it is not against those disturbing influences that we can hope to prevail. They will baffle all precautions; but that is of course no reason why an attempt should not be made to afford as much security as possible, and to decide whether any mechanical precaution or any set of regulations are at all likely to meet the desired object.

THE draft of a Bill has lately been laid before the French Senate, containing provisions for medicinal and pharmaceutical education, the details of which we propose to notice in a future number. Its consideration has been deferred by the occupation of the Senate and Corps Législatif; but it is evident that the subject has been thoroughly examined, and it may be assumed that the Bill shadows forth the reforms which are about to be made in France, in the important subject of superior education and professional degrees.

REPORTS ON THE EXAMINATIONS OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

In an Appendix to the Twelfth Report of the Medical Officer of the Privy Council are printed two lengthy reports from Professor Christison and Dr. Greenhow, the official Assessors of the Privy Council, in which they describe the objects and methods of the Major and Minor Examinations, and state their conclusions as the sufficiency of these Examinations. The greater part of these reports is occupied by the details of Examinations, with which our readers are well acquainted. The following are the more important of their comments. Dr. Greenhow says:—

"The technical examinations are made as practical as possible. The prescriptions submitted to the candidates are very various in character, and have all been actually written for patients and dispensed in chemists' shops. The ability to read prescriptions is obviously one of the most necessary qualifications for chemists and druggists, and a large proportion of marks has therefore been very properly allotted to this subject in both the Modified and Minor examinations. When present I have observed that although most of the candidates can read ordinary prescriptions correctly enough to ensure their being able to dispense from them with safety, comparatively few are sufficiently conversant with Latin to read with accuracy prescriptions couched in somewhat unusual terms, or having appended to them minute directions for use in the Latin language. The already-recited regulations sufficiently show the scope of the several examinations in the other subjects, and I may add, that the selection of specimens submitted to candidates for recognition is well calculated to test their practical knowledge.

"I have closely observed the mode of conducting the several technical examinations by the appointed examiners, and can bear testimony to the zealous and conscientious manner in which these gentlemen discharge their duty. On some occasions I have followed the same candidates through their examination in all the successive subjects, making my own estimate of the number of marks which they had earned in each subject, and then comparing this estimate with the number of marks assigned to them by the examiners, which has seldom shown any considerable discrepancy. On other occasions I have remained for a considerable time watching the examinations of successive candidates in the same subject, and have satisfied myself of their being conducted with perfect fairness and impartiality as between one candidate and another.

"I am informed that it is intended gradually to raise the standard of the examinations, and particularly of the First or Preliminary examination; but it would have been manifestly unfair to have passed suddenly from the degree of laxity which, before the passing of the Pharmacy Act, allowed persons to act as chemists and druggists without any examination at all, and to have begun at once to exercise a degree of severity in the examinations, which would exclude from the privileges of registration under the Act many fairly qualified candidates whose education had commenced before the Act was passed.

"The regulations have now, however, been in force for some time, and young men who may hereafter intend to become Chemists and Druggists, or Pharmaceutical Chemists, will have no reason to complain if, after a reasonable period has elapsed from the passing of the Act, they should be required to give proof of still higher qualifications before being admitted to registration.

"The fact of the rejection of so large a proportion of the candidates at every examination, would seem to show conclusively that the standard of the Board of Examiners is as high, and their mode of examination as stringent, as can be practically enforced at the present moment; and, even though the present standard only were maintained in future, the gain to the public would be very great, as they would thereby obtain security for a degree of competency in all the chemists and druggists throughout the country, such as was previously unknown, excepting among the best chemists in large towns.

"I have, in conclusion, only to repeat what has already been implied in my report, that, in my opinion, the examinations of the Pharmaceutical Society are of such sort, and are conducted in such manner, as to constitute a sufficient guarantee to the public with regard to the qualifications of persons admitted to register under the Pharmacy Act, 1868."

Professor Christison's most important comments and criticisms run thus:—

"The only remark I have to make on the Preliminary examination is, that while the examination on English and arithmetic was such as to prove a thorough knowledge on the part of candidates, the test of Latinity is at present pitched somewhat low. I am satisfied, however, that it would be unsafe to attempt to establish a higher standard on that subject for some time; for I am aware that for about thirty years past, in the class of society from which the candidates at the pharmaceutical examinations are derived, the acquisition of classical knowledge has been discouraged in Scotland through the activity of the utilitarian sect of educational enthusiasts, and that the quality of the teaching in many of the primary, and even some of the secondary, schools of the country has in consequence been thought to have undergone deterioration. The Edinburgh members of the Pharmaceutical Society, however, have expressed their desire to raise their standard of Latinity by degrees, and it is hoped that a thorough Education Act for Scotland will in no long time facilitate the attainment of that object.

"The Professional examination has, in my opinion, been conveniently subdivided by the Council of the Society; and the extent of examination under each head has been skilfully limited in its range to the topics which it is practically important for the pharmaceutic chemist to know.

"I witnessed several times an examination on every subject, except the fifth or botanical examination, and I have been gratified by the ability, fairness, patience, and kindliness of the examiners. I have also attended the decisions of the assembled examiners, both on preliminary and professional matters, and I concurred in the determination come to in regard to those candidates—some of them failures—whose examination I had witnessed, or whose examination papers I had read.

"The examiners being comparatively new to their duty, it is natural that they should now and then discover defects, and remedy methods of examination. A little more experience on my part may enable me to suggest improvements. At present I have but one suggestion to make. Most examining boards have found advantage in their candidates being examined on each subject of examination before two examiners, each duly qualified in the same subject. It is needless to point out how this system tends to secure fullness and fairness of examination—to satisfy the public—and also to promote the comfort of the examiners themselves, and their confidence in their own decisions. It is probable, therefore, that this measure may be found advisable in the practice of the Pharmaceutical Society also.

"The examination-books were put before me, and from these I find that, between January 1st and December 1st, 1869, a board for examination was held on eleven days; that 41 candidates were examined on preliminary education, of whom only 1 failed; and that the Minor, Major, or Modified examination on professional matters was undergone by 112 candidates in all, of whom 21 failed to pass.

"As I have seen no reason to doubt either the stringency of the examination or the fidelity of the decision of the examiners on preliminary education, the very limited amount of failure in this department may be taken as proof sufficient that the standard of examination may be raised when it may be thought advisable to do so. But for various reasons, which it is perhaps scarcely necessary for me to enter into here, I think the Society have done right in not fixing the standard higher at first.

"The results of the professional examination seem to me satisfactory in every point of view. First, the number of candidates who have come forward last year is considerable. Secondly, the rejections, amounting to nearly a fifth of the whole, testify that the duty of the examiners has been faithfully discharged. Thirdly, it is creditable to the candidates that the number of failures has not been larger; for in other professions about a fifth of failures seems the usual average when examining boards are well organized and faithful, and the generality of their candidates are well prepared."

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

The following communication has been received by the Treasurer, and gives gratifying evidence of the appreciation by the "Society for Aid to the Sick and Wounded" of the efforts made in its behalf by British Pharmacists.

"2, *St. Martin's Place, London, W.C.*
"*September 6th.*

"The Secretary of the National Society for Aid to the Sick and Wounded in War, and the Ladies' Committee, desire to thank the Chemists and Druggists of Great Britain for their Subscriptions, and for the very valuable medicines they have contributed, which were most grievously needed. They are immediately sent off to the Continent with no delay, as it has not been necessary to unpack them.

"*Elias Bremridge, Esq.*"

The following contributions have been received since last week:—

	£.	*s.*	*d.*
W. H. Allen, The Grove, Stratford	1	1	0
J. Bowes and Co., Whitehaven	1	1	0
John Broad, Hornsey Rise	1	1	0
T. Crowther, Tickhill	0	2	6
C. Emerson, 8, Church St., West Hartlepool	0	10	6
John Ingham, Upper Tooting	0	2	6
J. N., Assistant, Turnham Green	0	2	6
W. Parsons, St. Mary Street, Portsmouth	0	5	0
John Pepper, 207, Tottenham Court Road	1	1	0
R. O. Rippon, Great Berkhampstead	0	5	0
J. G. Rollin, 3, South Street, Durham	0	10	0
John Stevens, High Street, Broseley	0	10	6
Wilson and Kitchin, 30, King St., Whitehaven	1	1	0

Collections per W. Moss, Local Secretary, Carlisle:—

	£.	*s.*	*d.*
J. Daniel	0	5	0
J. Hallaway	0	10	0
J. P. Harrison	0	10	0
W. Moss	0	5	0
James Sawyer	0	5	0
J. Sowerby	0	10	0
A. Thompson	0	10	0
J. Todd	0	5	0
J. D. Walker	0	2	6
	£3	2	6

Per Mr. Wilkinson, Manchester, T. S. Johnson	0	5	0

Ferdinand Coles, 248, King's Road, S.W.,
2000 ¼ gr. morphia pills in boxes of 50 each.
4 lbs. lint.

W. E. Jameson, Reading,
6 1lb. stoppered bottles chloroform.

Per A. W. Postans, 35, Baker St., W. :— £. s. d.
Rev. Dr. Anderdon........................ 0 5 0
From a Lady,
Quantity of lint and linen.

Walter Lacey, Cotham, Bristol,
Box of Natal arrowroot.
1 oz. of quinine.
Bottle of pure chloroform.
„ „ methylated do.
Quantity of sponges.
2-, 3- and 4-inch bandages in 3, 4, 5, 6, and 12 yard lengths.

Per T. K. Williams, Welshpool:—
T. K. Williams,
1 oz. sulph. quinine.
Bottle of chlorodyne.
2 oz. hydrate of chloral.
G. W. Benson, Welshpool,
2 yds. waterproof sheeting.
3 2 oz. bottles of laudanum.
3 bottles 1 gr. opium pills, 4 doz. in each.
4 oz. cotton wool.
Thomas Griffiths,
1 lb. lint.

A. Yeatman, 141, Kentish Town Road,
1 gross 2 gr. quinine pills.
1 gross ¼ gr. morphia pills.
Quantity of lint and bandages.

Erratum.—The contribution announced in our last number from Messrs. Hearon, Squire, and Francis, 5, Coleman Street, should have been acknowledged as from Mr. Silvester, of Knutsford, per Messrs. Hearon, Squire, and Francis.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

September 7th, 1870.

MR. HASELDEN, VICE-PRESIDENT, IN THE CHAIR.

Present—Messrs. Bottle, Deane, Dymond, Evans, Hills, Reynolds, and Savage.

The minutes of the last meeting were read and confirmed.

The Report of the Finance Committee was presented, showing, on the General Fund Account, a balance in the Treasurer's hands of . . . . £342. 19*s*. 3*d*.
And submitting for payment accounts, amounting to . . . . £337. 11*s*. 7*d*.
On the Benevolent Fund Account a balance of . . . . £603. 17*s*. 11*d*.

Resolved—That the Report be received, and payments made.

Resolved—That the Report and Recommendations of the House Committee be received and adopted.

Resolved—That the Report and Recommendations of the Library, Museum, and Laboratory Committee be received and adopted.

Resolved—That the Pereira Medal be awarded to Frederick Hamilton Peck.

The Secretary presented the names of two members who had paid their subscriptions since the 30th April.

Resolved—That they be severally restored to their former *status* on payment of a fine of one shilling.

Resolved—That John Becket Hurst, of Louth, and Jonathan Sparke Walton, of Haydon Bridge, be and are hereby elected members of the Society.

Resolved—That the following, having passed the Minor Examination, be elected

ASSOCIATES IN BUSINESS.

Alford, Thomas ....Stonehouse.
Michell, Frederick John C. ......Falmouth.

Resolved—That the following, having passed their respective Examinations, be elected

ASSOCIATES OF THE SOCIETY.

Minor.

Broad, John Morris ....Hornsey Rise.
Sherburn, Thomas ....Harrogate.

Modified.

Baynes, James, jun. ....Hull.
Burn, Thomas................Hartlepool.
Gibson, William H. ....Brighton.
Hartley, Stephen ....Ulverstone.
Holmes, Frederick George ....Brill.
Jones, George Coverdale ......Bournemouth.
King, Abraham ....Bristol.
Metcalfe, Alfred ....East Retford.
Oldham, Gervase ....Stockport.
Siminson, Henry ....Kidderminster.
Tupholme, Edward H. ....London.

Resolved—That the following registered Chemists and Druggists be elected

MEMBERS OF THE SOCIETY.

Bray, William ....Buntingford.
Hickin, Henry ....Shrewsbury.
Iberson, John ....Barnsley.
Jackson, Christopher ....Acton.
Morris, Thomas Henry ......Rhyl.
Preston, W. L. ....Dalton-in-Furness.
Sowerby, Joseph............Carlisle.
Taylor, William............Saltburn-by-the-Sea.
Watkins, William Henry ....Blackwood.

Resolved—That a copy of the following resolution of the Provincial Education Committee be forwarded to the General Secretaries of the British Pharmaceutical Conference:—"This Committee recommend that the Council invite the British Pharmaceutical Conference to bring forward the question of Provincial Education for discussion at its meeting in Liverpool in September, which would give an opportunity for the interchange of opinion amongst those best acquainted with the question."

Resolved—That the schedules issued to Provincial Chemists' Associations having now been returned to the Council, an abstract of the same be prepared and printed, proofs of the same being issued, but that its insertion in the Journal be deferred until after the next Council meeting.

Opium.—Mr. Richardson, the Opium Agent at Benares, has conceived and carried out a judicious redistribution of establishments, which will result in a great extension of opium cultivation without entailing additional expense on the Government.—*Indian Daily News.*

Fly Poison.—A singular fatality is recorded by the *Times* as having occurred at Newmarket. A woman named Cooper, housekeeper to Mr. W. Boyce, was sitting near a table on which some poisoned papers had been placed for the purpose of killing flies. A fly was seen to leave one of these papers and alight on the woman's nose, which was slightly scratched. The wound speedily became inflamed; in a short time her whole system became affected, and she died in about twenty-four hours.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

The British Pharmaceutical Conference commenced its seventh Annual Meeting on Tuesday morning last, in the Lecture Theatre of the Royal Institution, Colquitt Street, Liverpool, under the Presidency of Mr. W. W. Stoddart, F.C.S., F.G.S. The Conference assembled shortly after 10 o'clock, when the business was commenced by the reading of a very long list of candidates for membership by one of the Honorary General Secretaries. The candidates reside in all parts of the United Kingdom, and one of them in Kentucky, United States; they numbered about 920, and were duly elected by ballot.

The President acknowledged the presence of Mr. Sandford, the President of the Pharmaceutical Society, an announcement which was received with applause.

Professor Attfield then read the

Report of the Executive Committee.

During the past year your Committee has been actively engaged in three important matters:—First, the organization of means whereby to produce such a Year-book of Pharmacy for 1870 as the meeting at Exeter decided should be issued. Secondly, the conduct and completion of a system of canvassing for members amongst the Pharmacists of England, with the double object of advancing the general aims of the Conference and securing a sum of money which would admit of the production of such a Year-book without interruption. Thirdly, the appropriate disposal of the Bell and Hills' Library Fund—a sum of fifty guineas, generously given to the Conference by Mr. Thomas Hyde Hills, with the suggestion that it should be employed in further stimulating pharmaceutical education.

The Year-Book.—In accordance with your instructions at the last Annual Meeting, your Committee proceeded to obtain the services of an editor, and to arrange for the publication of the yearly volume.

The salary of the editor was fixed at £100, this sum to cover the expenses incidental to the literary part of the work. In answer to the advertisement, four applications for the office of editor were received. After due consideration of the claims of the respective candidates, your Committee elected Mr. John Cargill Brough. A sub-committee of publication was then formed, consisting of Daniel Hanbury, F.R.S., W. W. Stoddart, F.G.S., Joseph Ince, F.L.S., Michael Carteighe, F.C.S., and T. B. Groves, F.C.S., with Prof. Attfield as Secretary. These gentlemen have reported as follows:—First, that they have accepted the estimate of Messrs. Butler and Tanner, of Frome, to supply the Year-book on good paper, bound, and otherwise complete, on terms within the means at the disposal of the Conference for the purpose. Secondly, that they have accepted the offer of Messrs. Churchill and Sons, of London, to undertake all matters connected with the advertisements on eligible conditions; to prepare the Year-book for delivery to members, and to place on the title-page the name and address of their firm as publishers.

Your Committee has instructed the sub-committee to make such arrangements as shall ensure the issue of the Year-book not later than December 1st. They can, however, hardly dismiss this subject without an expression of deep sympathy with the editor under the trying circumstances which have contributed to cause some delay in the fulfilment of his arduous and responsible duties, and an expression of their earnest hope for his speedy restoration to health and strength.

New Members.—In July of the present year, the secretaries drew up a circular of invitation to membership, and sent a copy, with specimen pages of the Year-book, to every pharmacist in England not already a member of the Conference. This course, supplemented by the active exertions of the local treasurers and other working members, has produced the gratifying result of swelling our numbers from about 600 to about 1500, and even this high number may, in the opinion of your Committee, be even further increased when the Year-book has been distributed, and opportunity been afforded for the recognition of its value.

The Bell and Hills' Fund.—Very soon after the last Annual Meeting of the Conference, the following letter was received from Mr. Hills by the Treasurer:—

"Herewith I have much pleasure in redeeming my promise made at Exeter, and enclose a cheque for fifty guineas. Twenty-five guineas I give in memory of my good friend Jacob Bell, who, I feel, would have been pleased with what the British Pharmaceutical Conference has done and is doing, and twenty-five guineas in my own name. I give the money to the Council of the Conference to do what they in their wisdom think will best promote a good feeling amongst pharmaceutists and assist the education and well-being of assistants and apprentices. I give it without conditions. You will remember I suggested that ten guineas' worth of books should be presented to the pharmaceutical chemists and chemists and druggists of the cities and towns in which the Members of the Conference may meet, as an addition to, or nucleus for, the formation of a library, where the assistants or apprentices may assemble for the purposes of study and mutual improvement. I think the Conference is a great success, and will do much good. The generous exhibition of good feeling of the chemists of Exeter and Torquay is worthy of imitation everywhere, London not excepted. The 19th and 20th of August will be red-letter days in my pharmaceutical calendar and green spots in my pharmaceutical life. The meetings bring forth kind sentiments and friendly feelings between men interested in the same business and obliterate imaginary jealousies. With best wishes for the success of the British Pharmaceutical Conference, believe me,

"Always yours faithfully,

"Thomas Hyde Hills.

"P.S.—The five artists' proofs of my good friend Jacob Bell which I promised to your Committee, I will have framed, to save the Conference trouble and expense."

The Committee accepted in trust this handsome donation of Mr. Hills, and returned him the warmest thanks of the Conference. A separate statement concerning this fund will be presented annually by the Treasurer. To the Library of the Exeter Branch Pharmaceutical Society, after appropriate inquiries and arrangements, your Committee granted ten guineas' worth of such scientific books as were most required by the local committee.

Railway Arrangements in connection with the Meetings of the Conference.—The privilege accorded by the railway companies to the British Association, namely, that of extending the time during which a return ticket is available, so as to include the whole period of the meetings, has often been desired by the members of the Conference. The number of those travelling to the Annual Meeting hitherto has not been, however, sufficiently great to take the trouble this arrangement would involve. But it was thought that perhaps the companies might allow the time covered by the return ticket to include the first Monday instead of, as usual, the first Tuesday of the Association week, and at Exeter last year, the President of the Conference addressed the President of the British Association on the matter. The answer was that the officers of the British Association had repeatedly attempted, but in vain, to obtain from the railway companies the extension mentioned.

In conclusion, your Committee desires to testify to the untiring efforts the Liverpool local committee has made to secure the success of the present meeting. The exhibition of objects connected with Pharmacy has been entirely organized by the resident members. The thanks of the meeting will doubtless be fully expressed to the Local Committee when, at the close of the sittings, the members will have had opportunities of noticing the extent to which the desire for their comfort and pleasure have been thoughtfully and completely anticipated.

On the motion of Mr. Sumner, seconded by Mr. J. Shaw, the Report and an accompanying Balance Sheet were adopted.

The following gentlemen were in attendance as delegates from various societies:—

Bristol Pharmaceutical Association.—The President, Mr. Stoddart.

Nottingham and Notts Chemists' Association.—Messrs. J. H. Atherton, J. Rayner.

Edinburgh Branch of the Pharmaceutical Society.—Messrs. H. C. Baildon, George Blanshard, D. Brown, jun., and J. Mackay.

Manchester Chemists and Druggists' Association.—Messrs. W. J. Brown, W. J. Halliday, J. T. Slugg, F. B. Benger and R. Hampson; Members of Council who may be present.

London Chemists' Association.—Mr. W. Martindale.

Ashton and Dukinfield Chemists' Association.—Messrs. Jabez Waterhouse and W. Bostock.

Scarborough Chemists' Association.—Mr. J. Whitfield.

Leeds Chemists' Association.—Messrs. R. M. Atkinson and R. Reynolds.

Bradford Chemists' Association.—Dr. Parkinson, Ph.D.

Sunderland Chemists' Association.—The Hon. Sec., Mr. J. J. Nicholson.

Bath Chemists' Association.—The Treasurer and Mr. C. Ekin.

Brighton Chemists' Association.—Mr. Savage.

Newcastle-on-Tyne Chemical Society.—Mr. H. B. Brady.

On the motion of Mr. Baildon, seconded by Mr. Evans, the following foreign members of the Conference were elected:—Mr. Carlos Murray, of Buenos Ayres: Senhor Joaquim Correa de Méllo, of Campinas, Brazil; and Professor Soubeiran, of Paris. The number of foreign members, which by the rules of the Conference, is limited to twenty, is now ten.

The President then delivered the following

Introductory Address.

Gentlemen,—It has now become an annual custom to commence our Conference meetings with an introductory address, the principal object of which is to briefly recall to our memories some of the most prominent observations or discoveries that have taken place during the previous year. Nor is the custom less instructive than interesting, for all who are in the habit of reading from month to month the labours of others know full well the value of such occasional reviews.

The prosperous career of the Pharmaceutical Conference is fully apparent in this our seventh meeting, which promises to fairly rival any of the former ones, both in number of visitors and interest of papers.

The number of new members is so unprecedented as to call for special notice as a great subject for congratulation. No fewer than 900 having been added to our list since the last meeting is a plain and unmistakable proof that the institution of the Society has not been in vain. Indeed, if any evidence were necessary to prove the appreciation of our annual gatherings, it would be most abundantly afforded by the good people of Liverpool, who have left nothing undone to make our visit successful, and ourselves at home.

I feel assured that it is not only the wish of your Council, but of all the members, that our various visits throughout the kingdom should be productive of good, by planting a seed or two of the tree of knowledge, which by a little careful training and judicious culture after our departure, may in after years yield the fruit of increased intelligence.

It appears to me that the fundamental idea of the Conference is the furtherance of Pharmacy proper, by directing attention to the proper means of scientific education, or judicious training, and the advancement of our status as a profession.

Nowhere in the kingdom is there a better spirit for improvement or stronger ambition for advance shown, than by the inhabitants of this part of her Majesty's dominions. I would therefore appeal to their experience whether or no the cultivation of the mind in scientific pursuits be not an exquisite source of pleasurable enjoyment and actual profit. It may be some curious reaction to be unravelled, some puzzling phenomenon to be explained, or the most profitable method of conducting an operation to be found, which, to the intelligent mind, furnishes a zest for exploration that must be felt to be properly understood.

What pleasure is there so innocent or so enthusiastic as the mutual examination of perhaps a common object under the microscope, or unfolding the nature of a substance with the subtle art of chemistry?

I do not for one moment believe that such works are only for the anchoret or the recluse; nay, a spirit of enduring and cordial fellowship is created, by the glorious relish of meeting a kindred spirit, to whom you can show a treasure, or with whom you can have an hour's chat.

In every age the pursuit of knowledge has been the theme of song and verse. The very nature of a man possessing a "mens sana in corpore sano" forces him to appreciate all that is beautiful, and fills him with an insatiable desire to discover the cause of the many wonders that are continually taking place around him.

> "Not a tree,
> A plant, or leaf, or blossom, but contain
> A folio volume. We may read, and read,
> And read again, and still find something new,—
> Something to please, and something to instruct."

That horrid, but perhaps necessary cry, *cui bono?* must sometimes be met, and surely past experience can satisfy the most mercenary spirit, and show that the so-called hobby of a philosopher, foolish as it may seem, frequently gives birth to results that must startle the most cold-hearted utilitarian.

I cannot endorse the assertion of Adam Smith that a philosopher is a person "whose trade is to do nothing and speculate in everything." Where would be our telegraph if Faraday and Oersted had not studied the properties of an electrified wire? Or the wonderful calculations of astronomy if Newton had let the fall of an apple pass by unheeded? To the student nothing should be considered too trifling or unimportant.

But it is to the improvement of our own particular profession of pharmacy that I wish to call your attention, hoping, as I do most sincerely, to enlist your interest.

We live and have our being in complete subjection to Nature's laws. How foolish, then, to remain without learning what those laws require, so that we may have them with us and not against us!

Pharmacy, of all pursuits, is the one most dependent on the proper use of these laws. The pharmaceutist must make the most he can of the numerous animal, vegetable and mineral substances with which he has to do, and to carry on his operations with the view of producing the best results. I am convinced that the most prosperous and happy of our body are those that bear these things in mind, and who look upon mental cultivation as a delight, and not as a necessary but disagreeable task.

Probably of all occupations for procuring the means of subsistence none surpasses our own in the small return for the large amount of work done. Truly the pharmaceutical motto ought to have been, "Nihil est aliud magnum quam multa minuta."

Thirty years ago the pharmaceutist was a literal tradesman, and for thirty years we lived in a theoretical anticipation of our character and status being raised to a higher standard. Our ever-to-be-remembered Jacob Bell and William Allen, with others of advanced views, steadily persevered in the attainment of this object, and hoped on in the face of strenuous opposition to see the things that we see.

Two years ago we obtained the long-wished for Pharmacy Act, but at our last meeting we had no practical experience of its working. All was in embryo. Since that time a twelvemonth has elapsed; and, though too short a time perhaps for a conclusive verdict, yet I venture to say that it has worked well, and now more than ever its expected benefits loom more decidedly in the future.

Let us always beware, however, of infusing a mercenary spirit into the conduction of our Pharmaceutical Society. Its main object is, and ever must be, the upraising of our Pharmaceutical education, and not the lowering it into a trades' union, a spirit which I am bold to say would prove its ruin.

We must not be too impatient of a little more nursing by the valued hands of the older members of the Pharmaceutical Society.

Chemistry, botany and physics are to us only secondary in importance to a well-grounded general education.

The study of botany is peculiarly a necessity, since we derive so many of our preparations from various plants; but its demands have been so well put before you on former occasions by our esteemed Professor Bentley that I must not take up your time by dwelling on them now.

Our younger members will need no reminder from me that great changes have within the last few years taken place in chemical philosophy. Chemistry now, more than ever, claims to be an exact science; and, although I fear many of us have bemoaned the change in notation and the attendant difficulty of unlearning an old system, yet the more simple explanation of puzzling organic metamorphoses will amply repay any trouble taken by the persevering student.

Nearly twenty years ago, our countryman, Professor Williamson, introduced to public notice the modern view of chemical types. Three years afterwards Gerhardt added to the Professor's water-type two others, the hydrochloric acid and ammonia.

From these views we have a more complete classification of the elements and their combinations than we ever had before. Ere many more years have elapsed, works on chemistry must be arranged on quite a different plan, especially with regard to the terms inorganic and organic.

In our older books the compounds included under these heads were supposed to be as distinct as if they belonged to the animal and mineral kingdoms. The term "organic" then denoted those compounds which were thought only producible in the bodies of plants and animals, and that their production was due to a supposed "vital force." Of course I here allude to organic and not *organized* bodies.

In later years many of these have been, and probably all will be formed by the chemical transformation of inorganic elements or molecules; as cases in point, I would mention the artificial production of alcohol, sugar, acetic acid, etc. etc.

Perhaps the best definition of an organic substance is, that it is a carbon compound, and that carbon in chemistry is analogous to desmids and diatoms in microscopy. The latter seems to be debatable ground between the animal and vegetable kingdoms, as carbon is between inorganic and organic chemistry.

Oxalic acid was once considered to be only found in the juices of plants. Now it has been prepared from purely inorganic elements. By the decomposition of a piece of chalk we produce the well-known gas carbonic anhydride or carbonic acid. Then by passing this gas over sodium and sand we have oxalic acid, identical in every respect with that found in the *Rumex* and *Oxalis*.

$$\underset{\text{Carbonic acid.}}{2CO_2} + 2K = \underset{\text{Oxalate of potassium.}}{K_2C_2O_4}$$

Our well-known alcohol is another instance of the artificial production from inorganic ingredients of what was formerly supposed to be formed only by the fermentation of starch or sugar.

By passing the vapour of that commonest of all minerals—sulphur—over the surface of red-hot charcoal, we have carbon disulphide, the disagreeable liquid so often used for dissolving india-rubber. Then, again, if we mix this with hydro-sulphuric acid gas, and pass the mixture over red-hot copper, or with carbonic oxide over iron, we may, as proved by the experiments of Mr. Berthelot, produce olefiant gas, or, as it is now called, ethylene (C_2H_4).

$$\underset{\text{Carb. disulph.}}{2CS_2} + \underset{\text{Hydro-sulph. acid.}}{2H_2S} + 6Cu = \underset{\text{Ethylene.}}{C_2H_4} + \underset{\text{Cupric sulphide.}}{3Cu_2S}.$$

Lastly, if we dissolve the ethylene in strong sulphuric acid, dilute with water and distil, we shall have as the result alcohol, similar in every way to that prepared by the distillation of grain—

$$\underset{\text{Ethylene.}}{C_2H_4} + \underset{\text{Sulph. acid.}}{H_2SO_4} + H_2O = \underset{\text{Alcohol.}}{C_2H_6O} + \underset{\text{Sulph. acid.}}{H_2SO_4}.$$

We might, in like manner, follow the synthetical formation of acetic acid from the same inorganic materials, carbon and sulphur.

The vegetable alkaloids, it is true, have not yet been artificially produced; but so great an advance is being made in the formation of organic compounds by artificial means, that I think it is not too chimerical an idea to expect a pharmaceutical solution of the philosopher's stone problem, and to manufacture quinia and morphia on the large scale. We should then be entirely independent of the *Cinchonaceæ* and *Papaveraceæ*, on which we now entirely rely for these invaluable medicines.

In the January number of the *Journal de Pharmacie et de Chimie* is an article by M. Bourgoin on the electrolysis of the vegetable alkaloids,—an interesting subject that has not hitherto received the attention it deserves.

It has for some time been known that the salts of vegetable alkaloids, when subjected to galvanic action, obey the usual law of metallic bases and acids, for the alkaloid appears at the negative and the acid at the positive pole.

The author states that the sulphates of atropia, brucia, strychnia, codeia, and quinia, when acted upon by the galvanic current, behave exactly like ammonium sulphate—

$$NH_4SO_4 = \underset{+}{SO_4} + \underset{-}{NH_4}.$$

But, more than this, he goes on to say, that when an *acid* solution of either alkaloid was used, and the conductibility of the liquid thereby rendered more perfect, the electrolytic action was much more violent. The solution became coloured round the positive electrode, and evolved oxygen, carbonic acid and carbonic oxide gases.

The most remarkable result of the experiment was that, in each case, *the colour produced was identical with that seen when the alkaloid was acted upon by strong nitric acid*. Thus, atropia and strychnia gave a yellow, brucia a blood-red, and codeia an orange colour.

This effect was the result of true oxidation, and not from the formation of nitric acid.

The experiment appears to strengthen the idea of Liebig, that the nitrogenous alkaloids are substitution compounds containing amidogen, NH_2; in other words, that they may be derivatives of ammonia, NH_3, in which one atom of hydrogen has been displaced by an organic molecule.

Having alluded to botany and chemistry, allow me to take up a little more of your time by giving an illustration of the advantage of a knowledge of natural physics, because many of the most beautiful phenomena pass under the dispenser's notice every day.

At our last meeting I had the honour of alluding to some experiments, showing the practical application of spectrum analysis to several of our fluid preparations. By means of the spectroscope many elements have since then been detected in articles of the Materia Medica, which, a few years ago, were considered great rarities.

On the table are the ashes of many pharmacopœial substances which contain the metals rubidium, lithium and strontium.

Lithium has been noticed in creta præparata, potassæ tartras acida, radix taraxaci, radix rhei, *Gentiana lutea*, *Atropa Belladonna*, *Nicotiana Tabacum*, *Triticum vulgare*, commercial pearlash, raisins, carbo animalis, carragheen and kaolin.

Strontium exists in many specimens of taraxacum, creta præparata, calamine, etc.

Rubidium has been detected in syrup made from loaf sugar which most probably had been manufactured from Austrian beetroot, also in oak-bark, from trees growing on beds of lias in the neighbourhood of Bristol, and in tea, coffee and cream of tartar.

Many samples of bismuthum album show the green line of thallium very distinctly, while oxide of zinc will sometimes indicate the presence of indium.

By some authors it has been denied that plants absorb from the earth such metals as are not absolutely essential to their nutrition. Experiments, however, afford strong evidence to the contrary.

Mr. R. Warington (*Journ. Chem. Soc.* 1865) found in the ashes of the beech and birch ·193 per cent. of manganese. In a case of cattle poisoning at Wells Assizes, the animals were proved to have been killed by eating plants containing lead derived from the soil on which they grew. Analysis showed that grass, weeds, fungi, thistles and shrubs contained a poisonous quantity of lead, although totally unaffected in their growth.

The triassic marls of Cotham, near Bristol, are celebrated for an abundance of celestine, or sulphate of strontium. An examination of the ashes of plants and shrubs growing on these strata nearly always shows the presence of strontium in small quantity. I have detected this metal in *Taraxacum*, *Arabis*, *Senecio*, *Capsella*, *Poa*, *Senebiera* and *Scoparium*.

In a communication to the Royal Society (*Proc. Roy. Soc.* 18, 546) Mr. Huggins says he has found traces of lime in every specimen of magnesia he has examined, even in what was sold as pure magnesium oxide and magnesium chloride.

When magnesium oxide was examined, the heat of the oxyhydrogen flame was necessary to bring out the calcium lines distinctly. He noticed that it was always most satisfactory to employ a minimum quantity of oxygen, for when too much was used they were not so distinctly visible. Dr. Emerson Reynolds, whose experiments were recorded in the same paper, gives the same results.

But perhaps of all the phenomena observed in pharmaceutical optics, that termed fluorescence is the most striking and beautiful. It is the ghostlike appearance which we see every time we dispense a bottle of mixture containing quinine, or syrup of red poppies. By very delicate methods of observation the singular fluorescent property may actually be seen on the white demy in which we wrap our bottles before sending them out.

It was formerly supposed to be occasioned by the reflection of light from an irregular surface, or from particles mechanically suspended in a solution, as when tincture of arnica is added to distilled water. In such mixtures, the effect to the eye very much resembles fluorescence, yet is of a very different character, and may be distinguished by the rays of light being polarized, which is never the case with the true diffusion of fluorescence.

The most convenient way of viewing these phenomena is by looking at the solution under examination through a prism, or by the actinic light of burning magnesium, or by passing the spark of an induction coil through a central vacuum tube.

Fluorescence may thus be observed in many substances of the Pharmacopœia, such as guaiacum, sulphate of quinine, *Hyoscyamus*, *Stramonium*, *Curcuma*, *Cannabis indica*, *Digitalis*, *Lobelia*, litmus, orchil, madder and *Papaver Rhœas*.

For some time the phenomena were explained by Sir J. Herschel, under the term epipolism, and afterwards by Sir D. Brewster as internal dispersion. It however remained for the President of the British Association, Professor Stokes, to discover the true explanation, viz. that the effects were caused by a change of refrangibility in the rays of light. The index of refraction is always *diminished*, because the length of the light wave is increased and the velocity lessened.

For instance, the invisible actinic rays which lie beyond the violet, are shown by quinine in the blue, by stramonium and curcuma in the yellow, and by chlorophyll in the red. In every case the change is towards the red end of the spectrum.

It sometimes happens that fluorescence is observed to commence in two parts of the spectrum, and would indicate that the solution under examination contained two distinct chemical compounds.

The bark of the horse-chestnut (*Æsculus Hippocastanum*) is a remarkable example of this. Its beautiful green fluorescence was formerly supposed to originate from a crystalline substance called æsculin. A more accurate series of experiments by Mr. Stokes has shown that two parts of the spectrum were simultaneously affected.

This fact aroused the professor's suspicion, which a chemical analysis afterwards proved to be well grounded. Two glucosides were produced, viz. æsculin ($C_{21}H_{24}O_{13}$), which gives a sky-blue light, and paviin ($C_{27}H_{30}O_{13}$), which gives a bluish-green. When an aqueous mixture of both these principles is submitted to examination, a light is perceived in every particular identical with that from an infusion of the original bark.

Thus it is that we often observe the different branches of natural philosophy dovetailing as it were into each other, and hastening to complete the chain of evidence required for the elucidation of some interesting problem.

The past year has been prolific in so many new and important discoveries that it becomes difficult to point out one or two only for consideration.

At our last meeting Mr. Hanbury brought before our notice a new hypnotic, the chloral hydrate. Then it was an expensive curiosity, now it is in every one's pharmacy and manufactured in enormous quantities. The general impression is, that it will prove a very efficient remedy, especially where opiates are inadmissible. It is, however, much to be regretted, that already another preparation has been introduced into the market, which only contains 70 instead of 90 per cent. of chloral, and which is declared by Dr. Liebreich to be devoid of any therapeutic power. The chloral alcoholate, as it is called, is not so deliquescent as the hydrate, and has a boiling point of 113·5° Cent. and a sp. gr. 1·34, while the true hydrate boils at 97° Cent., and has a sp. gr. of 1·57.

A very simple method of detecting the imposition by the use of ammonia is described by Mr. Umney. (PHARM. JOURN., Aug. 6, 1870.)

Sulpho-carbolic acid is another preparation that has recently been brought into use. It is made by combining sulphuric and carbolic acids in their molecular weights (49 to 94) at a temperature of 290° F.

That true chemical union occurs is evident from the fact that sulpho-carbolic acid gives no precipitate with chloride of barium or nitrate of lead. It produces a characteristic purple colour with perchloride or pernitrate of iron.

Many physicians affirm that it is a more powerful disinfectant than plain carbolic acid. The salts most commonly used are the sulpho-carbolates of soda and zinc.

Last year Mr. Hanbury alluded to the madder plant, a species of the *Rubiaceæ,* which, although not in our Materia Medica, yet is employed as a medicinal agent in manufacturing districts, and will, therefore, be my excuse for again alluding to it.

Its principal consumption, as you know, is for tinctorial purposes, and its value may be easily conceived when no less a sum than £1,000,000 is annually paid by us for foreign madder.

It owes its colouring matter to alizarine, which, singularly enough, does not exist in the living plant, but is produced by a kind of fermentation.

A few months ago two Germans succeeded in artificially making alizarine in quantity by the destructive distillation of coal-tar, like the well-known aniline dyes, alizarine being a product from anthracine as aniline is from benzol.

During the past twelve months our London and provincial brethren have not been idle at their evening meetings, for subjects of the highest importance have been discussed.

In London Professor Redwood, with his usual aptitude, has given a series of most useful notes on the Pharmacopœia, which have in their turn elicited practical remarks from our ever-ready friend, Dr. Attfield, and other members. Abstracts of these have appeared in the Journal, to which periodical I must also refer you for an amount of work done in the provinces, and which I think will thoroughly stand the test of criticism. Nor must I forget our Transatlantic *confrères*, who have been prosecuting pharmaceutical researches with great diligence. Their transactions are well worth an attentive perusal.

Since our last meeting at Exeter an International Congress of Pharmacists has been held at Vienna, and I trust we may have the pleasure of reciprocating the friendly feeling evinced on that occasion by a cordial invitation to our own shores.

In conclusion, I trust I shall be forgiven if I impress on every one present the importance of sinking petty differences of opinion, and uniting together in advancing the object for which we have met here to-day, viz. the promotion of pharmacy. We certainly have the opportunity, and we ought to take the greatest care not to let it pass unheeded or unimproved.

Government shows a disposition to help us in every way, and will give a decided preference to those who pass our examinations. For instance, they will admit no candidate for the office of naval dispenser until he has a satisfactory diploma from the Pharmaceutical Society. In return we are in duty bound to see that we fulfil our trust, and discharge the moral obligations that they have entrusted to our care.

We are pharmaceutists, that is, professed preparers of compounds containing the active principles of articles in an acknowledged materia medica, and such, in my opinion, ought to be our chief business, and the object of thoughtful study.

If my view be correct, our proper and legitimate aim ought to be attaining a knowledge of the best method of making those preparations.

I am well aware that in order to make both ends meet, a great number of our body combine a multitude of heterogeneous goods in their common stock. Nevertheless, I submit that it does not alter my idea of the desirability of a pure and simple pharmacy.

The general tendency of the medical profession of the present day is to leave to us dispensing of prescriptions which they prescribe. It is then plainly our duty to lose no time in rendering ourselves competent to undertake that office in the best possible manner.

At a late address Professor Huxley spoke very strongly on this point. He said, when speaking of the curriculum of study, "I would abolish Materia Medica altogether. . . . I cannot understand the arguments for obliging a medical man to know all about drugs and where they came from. Why not make him learn about cutlery, because he uses knives?"

I quote this as a very significant expression and sign of the times. I must confess I cannot go quite so far as the Professor, for the dispenser well knows the difficulty in dispensing that often arises from a want of knowledge in the properties and peculiarities of the drugs with which the prescriber has to do.

No one, I presume, would call the medical profession a trade, because in some out-of-the-way spot in the country, and many miles from a pharmaceutist, a medical practitioner dispensed his medicine or even the prescription of another. Then why should we be prevented from raising our status and entering the professional ranks, because some of our brethren in the country find it necessary to amplify their already small income by the sale of more general accessories?

It must be borne in mind, too, that the present time is an anomalous one, and one that will gradually pass away, like the old apothecary.

Let us then accept the challenge that is now virtually thrown at our feet, and do the best we can under the circumstances. In future years our children and successors will give us credit for, and enjoy the advantages which will have arisen from our present endeavours in their behalf. It may be that all the thanks the founders of Pharmacy will ever obtain, will be given by them long after we have passed away.

Nevertheless *we* should err if *we* forgot the long-tried, steady and faithful work done by such men as Squire, Morson, Deane, and many others whose names need only be mentioned.

Why should we not then unite hand in hand, and with the unselfish and free spirit of true science, proceed steadily onwards, surmounting every obstacle, and letting the motto on our banner be "Excelsior!" for

> "All the means of action,
> The shapeless masses—the materials—
> Lie everywhere around us. What we need
> Is the celestial fire to change the flint
> Into transparent crystal, bright and clear."

I cannot conclude without alluding to the great exertions of Messrs. Attfield, Brady and Reynolds on behalf of this Conference. I do not hesitate to say that to them we are in a great measure indebted for our successful progress. Few know the immense amount of work that has been willingly gone through by their untiring exertions.

Long may *we deserve* and appreciate their self-denial, and long, very long, may we enjoy the privilege of having them as our official guardians.

In a society like the present, money matters necessitate delicate, firm and careful management, and this we have in our esteemed Treasurer, Mr. H. B. Brady, who, though always considerate, is ever watchful for our interests; I sincerely hope, therefore, that we may hail him for many more years as Honorary Treasurer to "The British Pharmaceutical Conference."

On the motion of Mr. MACKAY (Edinburgh), seconded by Mr. WILLIAMS (London), a vote of thanks was accorded to the President for his excellent address; which compliment he briefly acknowledged.

The reading of Papers was then commenced, and was carried on till shortly after 4 o'clock, when the Conference adjourned to the Exhibition of Pharmaceutical Products, Apparatus, etc., which is held in a room over the Savings Bank in Bold Street.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Meeting at Liverpool.

The Fortieth Annual Meeting of the British Association commenced on Wednesday. It is the third visit the Association has made to Liverpool, and promises to be very successful. The first general meeting was held in the Philharmonic Hall. The retiring President, Professor Stokes, having vacated the chair, Professor Huxley, the President for the year, proceeded to deliver the customary address, the subject chosen by him being Spontaneous Generation.

The business of the several sections commenced on Thursday morning. Among the events of interest announced to take place during the meeting may be mentioned the discourse of Professor Tyndall, on Friday, upon the Scientific Uses of the Imagination; and the Lecture of Sir John Lubbock to working men, on Saturday, upon "Savages." The Mayor of Liverpool gives two *soirées* during the week. A *soirée* will also be given by Mr. Bickersteth, for which one thousand invitations have been issued. The excursions, seven in number, are fixed to take place after the close of the business of the Association.

SHEFFIELD SCHOOL OF MEDICINE.

The winter session of the Sheffield School of Medicine will commence on October 1st, when the Introductory Address will be delivered by the Rev. J. Lettis Short, and the Prizes distributed in the Anatomical Theatre at 4 P.M.

SOCIETY OF ARTS.

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture II.—continued.

There is one other remarkable instance which I must give you, to show the difficulty in some cases of analysing these phenomena. It is the case of the metal platinum, which I can hardly describe better in general terms, as regards its properties, than by comparing it to gold. It is what is termed a noble metal; it does not dissolve in any ordinary acid; you might boil platinum in nitric acid for any length of time and it would not dissolve. On the other hand, silver is a metal which dissolves readily in this acid, and if you melt silver and put platinum into it, it will also melt, and you obtain a compound of the two metals mixed pretty uniformly together. It was noticed that when such a button of platinum and silver is put into nitric acid, not only does the silver itself dissolve, as you would expect, but some of the platinum also dissolves with it; not the whole, but a portion. That seems, at first sight, favourable to the theory of contagion; it seems natural to suppose that the silver in dissolving has communicated the same tendency to the platinum, and made some of it dissolve. But that explanation will not do, and for this reason. When platinum is combined with anything else, I care not what, its properties are not the same as when uncombined. The very essence of chemical combination is that the particles which are in intimate contact unite, and that the compound possesses different properties from the original elements. We know that metals combine with one another; there are many cases known to us of the forcible union of metals, and we have no right to suppose in any case, unless we have actual proof of it, that a metal is present in such a compound with its ordinary properties. Therefore, it is not free platinum, but a compound of platinum and silver which dissolves, and there are some compounds of platinum which dissolve in water, and others which dissolve in nitric acid, so that this process has really nothing to do with contagious action.

In the composition of alcoholic ferments there are several substances of which we know very little at present, I am sorry to say, but the want of this knowledge is so great that I have no doubt it will be soon supplied; certainly, this is a most important field for the investigation of naturalists who possess an accurate knowledge of chemical manipulation. I mean the simplest and lowest organisms, whose functions are of such importance in these changes, and certainly claim much careful investigation. But some of the things which we do know about the yeast-cells, I must now state, with relation to the facts and ideas which we have just had before us. In the first place, with regard to their growth. It is very common, in the process of brewing, to feed the yeast-cells with a substance which is formed in the germination of barley. When barley is left in a moist state, at a suitable temperature, it begins to sprout, and during that process there is a change in two of its constituents, which I showed you the other day. One is gluten, a body containing nitrogen, which I compared, for the sake of convenience, to muscular fibre, being in reality very closely allied thereto in chemical composition, and during the germination of the seed this substance passes over into some product or products—I had better speak quite generally—known by the name of diastase. In the yeast-cells there is a substance very nearly resembling in composition this gluten, and it cannot be doubted that this gluten, or albuminous body as it is frequently called, is capable of undergoing a similar transformation into diastase, and of all foods the yeast-cell enjoys most those which contain diastase. I have a good many yeast-cells growing in a suitably heated chamber, and those which seem to thrive most are some which were put into an infusion of malt to which sugar was added. It is common, in the process of fermentation, to put in yeast in tolerable quantity, but the extent to which it grows depends upon the time for which it is left in contact in the material. I am told that the common proportion is about one-twentieth of the quantity of yeast required. For instance, if 20 lbs. of yeast are wanted to effect a given fermentation, you put into the liquid which has been fermented 1 lb. of yeast calculated in the dry state, and give it this diastase to feed upon. At the same time, there is sugar present in the liquid, and during the process of fermentation this pound weight of yeast increases more and more, by a process of true germination and growth. Professor Mitscherlich actually saw, under the microscope, some little cells of yeast sprout and put out, from the side of the parent cell, small cells, which gradually increased in size. The actual process, however, has not been seen by many observers. And not only does the yeast-cell in that way feed upon these albuminous bodies, which are grouped together by the name of diastase, but it also takes part of the sugar; and these are the two prominent facts which we know with regard to its food—that it feeds upon substances of those two classes; sugar, which contains no nitrogen, and also nitrogenous substances, which are formed by the partial breaking up of the gluten. On the other hand, its decomposition—I mean during its life; I am not speaking of any decomposition which its materials may undergo if it is killed—gives off alcohol, carbonic acid, succinic acid and glycerine; in fact, the four chief products of ordinary alcoholic fermentation, which I enumerated to you the other day. And while these products are being given off, there is at the same time a considerable quantity of nitrogenous substances being given off. The albuminous matter in the yeast-cells is undergoing decomposition, and is giving off nitrogenous substances. There is not any well-authenticated case of the yeast-cell forming, during its active functions, products of complete breaking up or putrefactive decomposition; all the products which we know best are substances of considerable complexity—less complex than the materials of the plant, but of great complexity; and, accordingly, the notion which Liebig had that the yeast-cell is active in the proportion as its materials are undergoing complete analyses or breakings up, and forming ammonia and carbonic acid, is not now entertained by that distinguished philosopher.

Some time ago, an exceedingly important experiment was made by M. Pasteur, with a view of testing the vital functions of the yeast-cells in a definite way. The statements which I have made to you contain a good many terms which are exceedingly general, as, for instance, the allusions to diastase. We really do not know what that is. We know about what sort of a thing it is made from, but not definitely. And the same with the nitrogenous products which are given off by the yeast-cells; we know something about them, but only a little. Pasteur put into a solution of sugar, in which some yeast-particles were present, some ammonia combined with an acid, and at the same time he put some of the ashes of other yeast-cells. He took a certain quantity of yeast and burnt it, so as to remove by oxidation the carbon, hydrogen and nitrogen of the substance, and the earth substances which remained, which are essential to the formation of a new yeast-cell, he put into some fermenting liquid, together with some salt of ammonia. When he did that, he really was treating the yeast-cells very much in the same way as a good farmer treats the wheat plant. If you want a wheat plant to increase rapidly, you must, in the first place, take care to supply to it all that the wheat plant takes up in the shape of mineral matter from the soil, and the best way to find that out is to burn some wheat, and see what is left. Then you must supply plenty of ammonia, and the more ammonia you supply up to a certain extent, the more rapidly does the wheat grow, by building up various simple substances into the complex substance, gluten, which I was speaking of just now. Pasteur put into such a mixture a few little cells of the yeast, and they did not thrive. They did transform some sugar into alcohol and carbonic acid, but they evidently were not at home, and at the end of a certain time, I forget how long, he found there was actually a smaller weight of yeast present than he had put in. That was a very different result from what happens when nitrogen is supplied to the yeast-plant in the form which I mentioned just now as the usual one; and I think the fact is most instructive, and serves to show us what kind of a being the yeast-cell really is,—I mean whether it should be classed among animal or vegetable beings. I need hardly say that absolute distinctions amongst beings which we find in nature are out of the question; we do not generally get any absolute line of demarcation, for one class flows over into the other; but still the ideas which serve us to classify organic and other beings are exceedingly important, and in a case like this it is certainly of considerable interest to have some leading idea, by which one may see whether there is a reason for placing these beings amongst vegetable or animal organisms, and we cannot help giving special weight in that respect to the kind of process which the respective classes of beings carry out in their organisms. Plants build up complex substances from simple. All the most complex substances that we can get are made in the organisms of plants. They may have been taken over by animals from plants, but they are formed in the main by plants. And the chief chemical activity of animals is precisely opposite; they take those complex substances, and break them down, by means of their vital functions, to the simple products which are exhaled and given off in the processes of animal life. Therefore, the question whether the process which the yeast carries on is a synthetical process, a building up, or whether it is in the main an analytical process, is certainly one of the most important which can guide us. Now, I think what I have said must appear to you all most conclusive in that respect,—that what we know best regarding the nature of the yeast-cells, the food which we know they take in large quantities, and upon which they live, is certainly exceedingly complex, and what the yeast-cells take up in preference is certainly sugar, and the very complex nitrogenous substances which are present in solution in the malt, and the products which they give off, are exceedingly simple in comparison. Their functions are in the main (those which we know best, at any rate) analogous to those which take place in animal organisms, and are most remote from those which take place in vegetable organisms.

In a paper which he has recently written on the subject of fermentation, Liebig has drawn attention, amongst other things, to the circumstance that the common alcoholic ferment can be made to eat tartaric acid. If you were to neutralize a solution of some of these crystals in water, and put with the solution some yeast-cells, at the same time supplying some nitrogenous material, the yeast-plants would grow, and transform that into other substances. In the same way, if you were to put in some of this malic acid (which got its name from the circumstance that it is present in sour apples), the yeast-cells would also transform that; and the same in other cases. One of the most remarkable decompositions is that of nitric acid, which, by the action of the yeast-cells, is deprived of some of its oxygen, and converted into nitrous acid, so that it would appear that the plant can actually assimilate or eat the nitrates, forming these simpler derivatives from them.

There is one case which I should like to show you, of an inorganic action, one in which there is no vital process concerned, but it bears a sort of general resemblance to what I conceive to be the principle of those which I have been speaking of. I have here a piece of platinum in a peculiar state, which is well described by the term "spongy." If I hold it in the flame of common coal-gas mixed with air, from a Bunsen burner, the spongy platinum eats the air or the oxygen contained in it and the gas. The word "eat" is not really so inappropriate as it may seem. If I were to put this spongy platinum into oxygen, I should find that it would combine a quantity of oxygen into its substance, and make it part of itself, and the same with regard to the coal-gas. So that here you see, from the heat which was given off, the substance is really effecting a chemical change upon the materials which it absorbs, and it effects that change in its own substance. It is admitted that, in some way or other, the yeast organisms—I will not again call them plants—actually assimilate and make part of themselves the sugar, or tartaric acid, or whatever it may be which they decompose; but they do not give off that substance which they have eaten in the same form. They give off its elements, after they have undergone a rearrangement in other ways. At our next meeting I propose to bring before you some different considerations regarding the vital functions of these organisms, and some points which bear upon questions of sanitary importance.

AMERICAN PHARMACEUTICAL ASSOCIATION.

From a circular issued by the Permanent Secretary, Mr. John M. Maisch, we learn that the Eighteenth Annual Meeting of the American Pharmaceutical Association was to be held on Tuesday the 13th of September, in the building of the University of Maryland, in the city of Baltimore. Ample accommodation has been secured in the same building for the exhibition of drugs, preparations, apparatus, models, and specimens interesting to and connected with the business of the pharmacist. The central position of Baltimore, and the important subjects to be reported and acted upon, are expected to render this meeting a very interesting one.

Obituary.

THE LATE BENJAMIN BROGDEN ORRIDGE.

"On the 17th July, at his residence, 33, St. John's Wood Park, Benjamin Brogden Orridge, Esq., F.G.S., in the 57th year of his age."

This brief announcement, which appeared in our columns a few weeks ago, probably conveyed to most of our readers little beyond the fact that a man active in business and without reproach in his conduct of transactions involving no ordinary responsibility and delicacy, had passed from our midst. To some, it is true, the words might have a deeper meaning, but the life they referred to had been so unostentatious that, even to colleagues in various engagements of a public character, it seemed to be associated with the single sphere of work they had in common. Of a many-sided existence, even his fellow-labourers saw but that which reflected the object they were mutually engaged upon, or at most it showed but a glimpse of its other phases. Hence a few details, meagre though they be, and gathered not without difficulty for this very reason, may have an interest alike for some who enjoyed his personal friendship, and others who knew him but by name or in connection with the Council of our Society.

Mr. Orridge was born at Malta in the year 1814. His father then held an official position in the island, which he resigned about the year 1820, and returning to England, settled at Oakham, in Rutlandshire, as Governor of the county jail. Here the boyhood of his son, the subject of our memoir, was spent, and during his education at the Oakham Grammar School, under the late Dr. Dancaster, he had for schoolfellows Noble and Pratt and others who have since become famous. In 1827, whilst still a lad, he lost his mother, and a year or two later we are told that he was apprenticed to his uncle, a chemist at Colchester. Beyond this we have no particulars of his early life.

Arrived at manhood he removed to London, and we hear of him shortly afterwards as Dispenser to the Marylebone Infirmary. He entered the Pharmaceutical Society as one of its founders, and, at a later period, settled in the City as a confidential agent in the transfer of pharmaceutical businesses and medical practices, acquiring eventually a high reputation for probity and skill in such negotiations.

Separated by the nature of the occupation he had chosen from the actual practice of pharmacy, he still found an ample sphere of usefulness to his fellow-members, giving his attention to such objects as the scrutiny of measures of general or local legislation likely to affect the interests of pharmaceutists. But the subject he laid to heart above all was the Benevolent Fund, its condition and prospects; and chiefly with a view to effecting some alterations in its administration, he allowed himself to be nominated for the Council in 1864, when his well-known name secured his immediate election.

It is needless to recount his various efforts in respect to the Fund, he was not less zealous in its augmentation than urgent in its liberal distribution; nor is it too much to say that to Mr. Orridge more than to any other single member, its present noble dimensions are attributable. Others worked with him and heartily, but to his clear judgment and appreciation of its proper scope we owe the wider basis on which it at present rests, and many may bless him for the provision it now affords to enfeebled age and desolate widowhood.

Such is the simple chronicle of his life so far as immediately concerns us; he had done his work, and only resigned his seat in our Council a few months before his death.

This, however, is but one sphere in which his active mind courted usefulness. He was a good citizen, and ever ready to work for the common weal. His earliest public services in the City were in connection with the Cheap Ward Benevolent Fund, of which he was for many years the Treasurer; and upon his recent retirement from that office the members accorded to him an emblazoned vote of thanks, as their testimony to the value of his labours. In 1865 he was elected to represent the Ward of Cheap in the Corporation of the City of London, and soon found a department in which his special qualifications met with congenial employment; he was at once appointed to the "Library Committee," and in 1868 was chosen its Chairman. A valued member of our Society, a colleague in the City Council, thus speaks of him:—"As Chairman of the Library Committee, he was over-zealous and over-anxious, and went to the work as if that alone were the labour of his days, instead of giving only that part which a man of business can afford to take from the steady routine of active and thoughtful life." He was greatly interested in the history of City life under the Tudors and Stuarts, and whilst he held office as Chairman of this Committee, he ascertained that, hidden amongst the old papers of the Town Clerk's Office in Guildhall, was a large collection of copies on parchment of letters from Queen Elizabeth, James the First, Charles the First, and their Ministers, to the Lord Mayor of London, between the years 1577 and 1640. He prepared an abstract of some of these relating to plays and players, and matters of religion, which was printed in the *Athenæum* last autumn; and in the spring of the present year he moved for and obtained an instruction to the Library Committee to examine and report upon the discovery referred to, and generally upon the condition of the Corporation Archives.

His literary labours were chiefly directed to archæological subjects. In 1868, he published a work entitled 'The Citizens of London and their Rulers,' the historical portion being reprinted from Norton's 'Commentaries of London;' and in the following year was a contributor to the 'Proceedings of the London and Middlesex Archæological Society.' At the time of his death he had a volume in the press on 'The City Friends of Shakespere,' which we understand is likely to appear almost immediately. Had his life been spared, these might have been but the beginning of a series of such works, for which he always maintained that material enough existed in neglected and forgotten corners of the City.

Need we say more? His monument is with us in the Benevolent Fund; may the loss it has suffered in his removal be more than compensated by the increased activity of those younger members of our body whose welfare was ever an object of his solicitude.

H. B. Brady.

Poisoning by Carbolic Acid.—An inquest has been held at Ulverston, upon a man named Lace, whose death had resulted from the drinking of some carbolic acid. It appears that it is the custom to use carbolic acid as a disinfectant at the sewage tanks, by pouring it in as often as a bad smell arises. On the day in question two gallons had been obtained for this purpose, and when the men went away to get something to eat, the bottle was left standing by the side of the tank. The deceased who had formerly been employed on the premises, seems to have mistaken the contents for raw spirit, which was sometimes served out to the men who worked at the tank, and, although it was labelled "Poison," drank about a gill of it. He was immediately seized with symptoms of poisoning, and died about twelve hours afterwards.

The following journals have been received:—The 'British Medical Journal,' Sept. 10; the 'Medical Times and Gazette,' Sept. 10; the 'Lancet,' Sept. 10; the 'Medical Press,' Sept. 14; 'Nature,' Sept. 8; the 'Chemical News,' Sept. 9; 'Journal oft he Society of Arts,' Sept. 9; 'Gardeners' Chronicle,' Sept. 10; the 'Grocer,' Sept. 10; the 'English Mechanic,' Sept. 9; the 'Pharmacist' for September.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

THE KEEPING OF POISONS.

Though there has been much discussion upon the keeping of poisons since the passing of the Pharmacy Act, there do not appear to have been any regulations suggested which have met with general approval. Throughout the discussion my impression has been that legitimately the subject *might be*, and perhaps *should be*, allowed to subside without any immediate steps being taken beyond those which are already prescribed by the Pharmacy Act.

Clause 1 provides that we shall conform to such regulations as to the keeping, dispensing, and selling of such poisons as *may from time to time* be prescribed by the Pharmaceutical Society, with the consent of the Privy Council.

And clause 2 provides for a schedule of poisons, and "the Council of the Pharmaceutical Society *may from time to time* by resolution" add to the schedule list.

We are thus enabled—maybe I should say required—to add in two ways to the provisions of the Pharmacy Act *from time to time*. Under all ordinary circumstances I should have understood that to mean whenever the Society considered that additions were required.

Keeping in view the Society's long struggle to make educational qualifications the only legal restriction upon the dealing with poisons, and their repeated protests against angular bottle contrivances and other proposed substitutes for the responsibility of reading the label in every instance, I think the Society might reasonably be allowed to give a fair trial to regulations at present required by the Act before it commenced to make additions to them. But if it is required of us to do something more without delay, as appears to be the case, I would not by any means have us neglect that duty, though we may undertake it with some reluctance and hesitation. It would not do for us to prescribe any ill-considered or unsatisfactory regulations, by way of showing our willingness to do our best, and as yet I have not seen any which I would willingly see enforced.

In offering another plan for discussion, I do so upon the ground of its being useful as far as it goes, and its not attempting too much. In the keeping of poisons, each poison shall be kept in a box, bottle, vessel, or package distinctly labelled with the name of the article.

All poisons not intended for medicinal use shall also be distinctly labelled "poison" immediately under the name of the article.

All poisons to be used externally as medicines, but not intended for internal use, shall be labelled either with the word "poison," or "for external use," immediately below the name of the article.

All poisons intended for internal use as medicines, the usual adult dose of which is less than one dram, shall bear a label immediately under the name of the article, stating the usual adult dose; and upon such articles the usual adult dose of which is less than (say 5) grains there shall be added the label "poison" immediately below the label indicating the dose.

The code of regulations submitted to the last Annual Meeting proposed that all poisons should have the poison label attached, but considering that the number of poisons by Act of Parliament is very considerable, and liable to grow by additions from time to time,—two evils attached to it which are obviated in the proposition which I have just made, namely, that the word poison would, in the former case, become so common as to lose its value as a caution to the dealer, while it would add to the uneasiness of the patient to find how numerous were the poisons and how freely many of them were dispensed. The only articles in the present amended list of poisons not used in medicine are oxalic acid, essential oil of almonds and vermin killers; they, of course, would bear the poison label.

Red and white precipitate, liniments, ointments and plasters containing aconite, belladonna, opium, etc., would naturally be labelled "for external use."

The mild preparations of opium and poppies would require no addition to their names; the more potent tinctures of opium, aconite, belladonna, etc., would have the dose attached, as indicated in the pharmacopœia, or such dose as might be fixed by some competent authority (say the Pharmacopœia Committee), and the most potent poisons only would have the poison label attached.

I have suggested 5 grains as the dose which should mark the boundary between the more and the less dangerous drugs, but this is matter for discussion, the object being to include all that are specially hazardous, and at the same time not to include *too many*. Arsenic should have the poison label, though its solutions would probably be sufficiently protected by having the dose indicated. So of the alkaloids, morphia and strychnia would have the poison label, while their liquors would be labelled respectively "Dose 10 to 60 minims" and "Dose 5 to 10 minims."

If it be considered necessary to adopt poison cupboards, angular bottles or sand-paper, I think they should only be applied to those articles the dose of which is 5 grains and under, or some other limitation which shall not involve the absurdity of using the same precautions to all the articles in so crude a list as the official schedule of poisons. It is no protection to use an angular bottle if angular bottles become too common, as they would do if used for all poisons, from syrup of poppies to strychnine. It may be said that a label stating the dose would also become too common, but it would always give useful information, and would, when read, indicate the degree of danger, and the degree might be in some measure indicated pictorially. Thus, the most virulent might have red angular labels for the dose [$\frac{1}{30}$ gr. Dose to 1 gr.] [1 to 5 gr. Dose.] the next less dangerous having angular white labels [Dose 5 to 10 gr.] [Dose 10 to 30 gr.] and the least dangerous of the articles requiring to have the dose affixed should have it upon a circular green label, thus— [Dose ʒss to ʒi]

This arrangement would have the advantage of leaving any one to carry out such additional precautions as best suited his premises and his requirements. Many of us would probably put the articles with the red angular labels into a poison cupboard; some would also keep a separate part of the shop for those bearing the white angular labels; while those with the green circular label would come under the ordinary classification of alphabetical order in the wet and dry departments.

BARNARD S. PROCTOR.

Grey Street, Newcastle, September 6th, 1870.

Sir,—You have invited the members of the Society to express their opinions as to the advisability or otherwise of adopting certain regulations with regard to the storing of poisons.

I shall be glad if you will allow me space for a few remarks on the matter.

The discussion of the subject has given rise to much excited feeling, and perhaps for this reason it has obtained an importance it does not really deserve.

To consider it carefully and impartially now will probably do much to bring about a satisfactory solution next July.

Whatever importance the subject may have possessed before the passing of the Act of 1867, it must, in my opinion, be much diminished now that the Legislature requires a certificate of competency from all who would enter the profession of pharmacy. For may it not be reasonably inferred that a man who is considered fit to undertake the greater responsibility of dispensing may be entrusted with the lesser office of distinguishing between one drug and another, or of storing them safely?

But here, as experience everywhere else abundantly shows, our action must be guided, not by the standard of a logical theory only, but also by the necessities of the case.

The public, through the Legislature, has given us a corporate existence, and has endowed us with a monopoly not for our own aggrandizement, nor that we may hold a semiprofessional status; these may be results, but the public safety was the reason, and the Legislature will jealously watch that we use our best efforts to attain that end.

Now the public safety is as much a matter of solicitude to us as to the Legislature, but there exists a difference of opinion as to whether that is best assured by the imposition of minute regulations added to proved competency, or whether after having provided competent men, all details are not better left to their individual discretion. The public generally believes in poison bills and regulations, pharmacists, as a rule, do not; they think that a qualified man is not only worthy of, and entitled to confidence, but that his competence is the best safeguard for the public against the risk of accidental poisoning. Unfortunately, even the highest ability united to long experience is not an absolute guarantee against accident or mistake, and instances have occurred within the recollection of us all where, through some unaccountable mischance, caution and ability, successfully applied for many years, have suddenly failed, and fatal accidents have happened, which some simple mechanical contrivance or local arrangement might probably have rendered almost impossible.

It is this fatal liability that forms the real argument in favour of a code of compulsory regulations, and the argument receives additional weight when it is remembered that there are few pharmacists who are not assisted by young men whose education is incomplete and in various stages of progress.

In reply it may be said, if in the case of a medical man who is not better acquainted with drugs and their preparations than a pharmacist, and is assisted in the same way by younger men and students, no interference is considered necessary, why should it be required from him? But it must be borne in mind that medicine is an old profession, and has long held the confidence of the public, while pharmacy, as a recognized profession, dates from yesterday. Moreover, we are in a transition state, and cannot use the educational argument so forcibly as we shall be able to do in a few years' time, when the standard of qualification will be more equal.

For these reasons, among others, I may perhaps be allowed to say that it is desirable that for our own and for the public safety, some means should be devised to prevent, if possible, these accidents which happen in our unguarded moments, rare in their occurrence, but which without some physical bar *will* happen in spite of the extremest caution, and which are so lamentable in their character and effects that they warrant us in adopting every means in our power to prevent them.

The area of the proposed regulations then is limited to accidents of this kind, and it is further limited by the fact that the guarantee required is already given by a large proportion of chemists.

Were poison regulations adopted, they would do no more than make universal a practice which is now general. Would this be worth doing? I am inclined to think it would be. Would it be worth doing by compulsory legislation? Certainly not. The best men in the Society, the men who are most competent and most careful, the men who do most to ensure the public safety and preserve their own reputation, would deprecate anything like police interference as being personally offensive and destructive of anything approaching to a high-toned feeling of responsibility.

In lieu of anything like compulsory regulations, I would suggest, and commend the idea to the consideration of my fellow-pharmacists, that a code of reasonable rules should be drawn up after ample consideration and issued by the Council, with the sanction of a general meeting, with an *urgent recommendation for their adoption.* Few in number, simple and inexpensive in character, and interfering as little as possible with generally existing arrangements, they might be made thoroughly efficacious, and be a real safeguard. Issued by the present Council, they would be free from the objection raised last July, that they could be framed in the interests of the London members only; and the London members could not refuse to adopt regulations not different from or more stringent than those recommended by the last Council, in which they were represented by a majority, while country members would stultify themselves by objecting to rules framed by a Council pre-eminently provincial.

Since the somewhat stormy discussion in July, the subject has been in abeyance, and it was a question with me before writing this letter whether it were judicious to reopen it, but as indications are not wanting that the Legislature still looks to us for a solution of the difficulty, I have ventured, I trust without unreasonable bias, to suggest a course which, if pursued, would, I think, meet the views of all parties and lead to a satisfactory result. By its adoption the public would obtain the additional guarantee against pure accidents for which it asks, and the pharmacist would not be subjected to intrusive interference from without.

United action alone can procure its success, or that of any course which shall be alike satisfactory to the Legislature and honourable to ourselves.

"VIA MEDIA SALUS."

PHARMACEUTICAL TITLES.

Sir,—In glancing over the correspondence inserted in the Journal these last few weeks, I am rather struck with the desire of one or two parties to parade their intellectual status before the eyes of their *confrères.* It is a remarkable fact that the more sound doctrine a man has instilled into his mind, the more he is persuaded by that knowledge to humiliate himself before men. A great man has said, "Wisdom is the standard of the soul, therefore get wisdom;" but our friends the "Aspirant to the Major" and "T. C." seem to think that the only reward for their great attainments is to be realized in the appendage of F.R.C.P.G.B. to their names. I, for one, would grant them what they ask without a moment's reflection; else (as with some people) they may be unable to bear the slight, and consequently withdraw their energies from the field of "Major operations," leaving us to exclaim, "They have fallen, and great has been the fall thereof." Before closing my letter I would ask our friends to show a little brotherly love towards the persons of retiring demeanour who "go in" for the *very modified* curriculum, and who do not wish to place themselves side by side with "Major fellows," except as gentlemen; also, I would just note the great justice in granting a "grand flaming diploma" of M.P.S. to persons solely on the ground of their having been in business prior to the late Pharmacy Act, whereas all those who have been at some expense (though not to be compared to the Major) to pass the *Modified* have not even a decent scrap of paper to show, but only the threadbare consolation of a yearly subscription. My advice to all whom it may concern is the motto of "Aspirant,"—*agitate* until the rights of every one connected with the business are fully acknowledged by the Council, whether Major, Minor, Modified, or non-modified men.

I remain,

Barnsley, August 30th, 1870. OMEGA.

Liebig's Malted Extract Biscuits.—We have received from Messrs. Millard and Sons specimens of two varieties of these biscuits.

R. Thomas (Merthyr).—The price of the French Codex is 9 fr. 50 c., and the London agent is Mr. Baillière, Regent Street.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

The General Index to the first Fifteen volumes of this Journal may be obtained of the Secretary, 17, Bloomsbury Square, price 2*s.* 8*d.*, post free; bound in cloth, lettered, 3*s.* 8*d.*, post free.

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THE ADULTERATION OF SAFFRON.

BY DANIEL HANBURY.

Saffron is, at the present time, the subject of a serious adulteration, to which I think it important to call attention, the more so as I find that its nature and extent are not fully known even to experienced druggists. Saffron adulterated in the manner I am about to describe, is for the most part, *undistinguishable to the eye* from the drug in a state of purity, yet the means of discriminating between the genuine and the fraudulent are of the most simple character.

Let me remark at the outset that there is, in my opinion, no method of testing saffron more effectual than that of scattering a very small pinch on the surface of a glass of warm water. The stigma of the saffron-crocus immediately expands, and exhibits a form so characteristic, that it cannot be confounded with the florets of safflower, marigold or arnica, or with the stamens of crocus itself.

It was in performing this simple operation that I detected that some saffron which I had just purchased had been treated with a heavy earthy powder, which speedily separated from the lighter stigmata, and fell to the bottom of the glass. Upon collecting and examining this powder I found it to be *carbonate of lime*, which, by some ingenious process of which I am ignorant, had been made to adhere to the thread-like saffron without in the least altering its general appearance.

To ascertain the amount of earthy matter thus fraudulently added, I subjected several specimens of saffron to incineration, each having in the first instance been dried in warm air until it ceased to lose weight. The results obtained in the examination of eight samples are indicated in the following table:—

Examination of Saffron.

Sample.	Description.	Percentage of Ash.
No. 1	Origin unknown, . *pure*	5·90
„ 2	„ „ „	4·48
„ 3	Valencia, ... „	4·41
„ 4	„ . . . . „	5·20
„ 5	Alicante, . . *adulterated*	21·22
„ 6	„ . . „	12·72
„ 7	„ . . „	28·01
„ 8	„ . . „	15·36

Sample No. 2 the quality remarkably fine. Sample No. 3, so-called *Valencia*, pure, but not of finest quality. Sample No. 7 adulteration perceptible to the eye, many of the stamens being crusted with an orange-coloured earthy powder.

The method of testing a sample of saffron for earthy adulteration which I recommend is this:—Place in a watch-glass a very small quantity (say, 1 grain) of the saffron, and drop upon it 8 or 10 drops of water; lightly touch the saffron with the tip of the finger, so as to cause the water to wet it. If the drug is free from earthy matter, a *clear*, bright-yellow solution will be immediately obtained; if adulterated, a white powder will *instantly separate*, causing the water to appear *turbid*; and if a drop of hydrochloric acid be now added, a *brisk effervescence* will take place.

Saffron almost always contains a few of the pale yellow stamens accidentally gathered; but the pollen from them which is detached when the drug is wetted, but which is minute in quantity, is easily distinguished from carbonate of lime by not dissolving when hydrochloric acid is added. Moreover, the form of pollen-grains may be easily recognized under the microscope.

*** Since the foregoing paper has been in type, I have received the *American Journal of Pharmacy* for September, in which I find a note by Professor Maisch calling attention to the adulteration which I have here described.—D. H.

THE WATERS OF THE BRITISH PHARMACOPŒIA.

BY GEORGE BROWNEN.

Distilled waters constitute an important class of preparations in the B. P. and have often attracted the attention of pharmacists. Haselden, Proctor and others have examined them, and thrown some light on their manufacture and preservation; but our knowledge of them is still incomplete. Much that is mysterious goes on in them; they alter in taste and appearance. Opaque waters become nearly clear, and their harshness gradually tones down to mellowness.

All the B. P. waters but one are distillates, and that one—aq. camphoræ—is made with distilled water. The apparatus for distillation is familiar to us all. By its use volatile oils, though possessing higher boiling-points than water, are diffused in steam, carried over and condensed, free from inert matter, which is left behind in the still. Forms are given in the British Pharmacopœia for preparing twelve of the thirteen official waters; the other one, aq. flor. aurant., is an imported article. For making some waters the directions are exceedingly minute, for others quite the contrary. In aq. camphoræ, for instance, the old stopper is no longer used; a glass rod must sink the camphor in the water. This may suit some, but not those who have to make this water in large quantities, as it is found that long glass rods are easily broken, and the advantages of long pieces of glass over short ones are not equivalent to the increased cost. On the other hand, the camphor is only ordered to be "in pieces," but whether large or small the B. P. does not say. Yet this vagueness greatly affects the time necessary for saturation. Again, in the case of aq. anethi, bruising dill fruit is not an easy task, but, having accomplished it, we distil the authorized quantity. Now, if we leave the residue in the still to macerate till the next day, and then distil again another and an equal quantity, it would puzzle most people to know the right from the wrong article. Yet none of the waters of the British Pharmacopœia, except aqua lauro-cerasi, are supposed to want maceration. This curious mixture of carefulness and uncertainty strikes us, if we look on these waters as a class or section of the B. P.

Upon examining each separately, aqua and aqua destillata first attract notice. A hard taste must be no taste at all, pharmacopœially speaking, or we should have to reject the waters of some of the London water companies. In distilling water, the first $\frac{1}{20}$th is rejected, the next $\frac{16}{20}$ths saved. The tests given in the B. P. refer only to mineral matters, which, of course, are separated; but many volatile bodies, and the results of organic decomposition, still remain in the water, as well as substances having a high volatilizing-point, but which come over with water in distillation. When a recently-distilled water, giving no precipitate with liq. calcis, has been mixed with a little peroxide of hydrogen and re-tested with liq. calcis, I have sometimes found a precipitate of calcic carbonate. I have attributed this to the oxidation of a carbon compound into carbonic acid. Another effect of this process of oxidation has been the destruction of that musty odour so common to recently distilled water. I have theorized on these facts in this way: these odours may be partly the result of electric action in the still, and partly the result of algæic or infusorial decomposition; slowly these forms of matter pass into more highly oxidized, stable and odourless states, and we say the water has improved by keeping. Well, for medical purposes so it has; and perhaps this may throw a ray of light on an after subject. Of substances volatilizing in connection with boiling water, ammonia nitrate may be taken as a type. If a solution of brucine be added to recently-distilled water, and sulphuric hydrate be allowed to trickle down the side of the test-tube, a rose-coloured zone, changing to yellow, may be seen at the line of union in the two fluids, indicating nitrates, and ammonia may be readily found by Nessler's test. I have obtained the same results in distilled water when more than double the Pharmacopœia quantity has been rejected.

Gases, as nitrogen, etc., distil over with water. According to the experiments of Douny and Grove pure boiling water has not been obtained; their experiments tend to show that nitrogen expanding by heat into a gaseous bubble carried away an atmosphere of aqueous vapour; that in the process of boiling, nitrogen was absorbed as well as evolved; that in sealed tubes boiled by electricity it was still eliminated; and these and other experiments go a great way to prove that the action of heat on pure water would cause decomposition. But such refinement is not required for the pharmacopœial article. I have referred to it as confirmative of a theory I shall shortly state.

In aqua destillata we possess the most powerful solvent known, and as such it is one of the most delicate articles to keep. It absorbs gases as rapidly as it is distilled; some, as oxygen and nitrogen, with remarkable avidity and force; and others, as the common laboratory gases, carbonic acid and ammonia, also with great rapidity, and then minute important and puzzling changes are the result. Not only salts and minutely-divided substances, but metals also, are attacked by water. Iron is dissolved as ferrous and ferric oxides, and lead, zinc, and its compound pewter, with their well-known injurious results. Copper is as easily dissolved as either of the others. Cupreous water gives the blue coloration with ammonia. Manganese, mercury, silver, gold and platinum are also attacked. Tin is dissolved from the worm, tinned vessels, etc., and after a little time thrown down as stannic oxide; to this action Parrish attributed the unpleasant odour of distilled water. Cadmium, bismuth, silica and glass may be added to the list, and it is probable, if I could have experimented with the whole list of elements, nothing would have completely resisted aqueous action, or the almost, if not entirely, nascent condition of its gases. What, then, should we use as vessels for aq. destillata? I think this shows that glass, or metallic cisterns coated with their most insoluble compound, would be the safest and best. And yet we need not wish the absorptive and changeful properties of water less, or nature's great sanitary operations might be interfered with. Sewage and decaying matter soon find their way into water, and if water could not quickly change them into innoxious compounds there would be death in the pot of teetotallers and non-abstainers alike. Especially should Londoners be thankful,—with chimneys overhead, dustbins and other surface pollutions, and sewage underfoot, evolving putrid gases, etc.,—that water is so industriously and incessantly turning the noxious into less hurtful compounds.

I have dwelt thus long on distilled water as all the substances found in that water, including the rejected distillate, are also found in the medicated waters of the Pharmacopœia. To these waters I now briefly call attention.

Aqua Anethi.—1 lb. of the fruit yields from 3 to 7 drachms of oil, sp. g. ·90. In a note to his translation of the P. L., Phillips says that this oil is soluble in 1500 parts of water; if so, it is evident the proportion of fruit or oil is excessive in the B. P. form. This is a fact, and, if maceration had been ordered, the quantity might have been halved and a superstratum of oil still obtained.

Aq. Flor. Aurant.—The foreign preparation, with which a syrup is made, often substituted for syr. capillaire. The tests given for this water should have Gobley's test. Ph. J. Ap. 66, added to them; this test detects orange leaf and oil of neroli water. 1 lb. of orange flowers yields about ʒss of oil, sp. g. ·88.

Aq. Camphoræ I have already referred to. If the camphor is beaten in a mortar without spirit, I find it can be reduced to a coarse powder, incapable of sifting through the muslin, but sufficiently fine to make the water quickly.

Aq. Carui is very similar to aq. anethi; both preparations are reduced in quantity from the P.L., and by the adoption of maceration previous to distillation, might still further be reduced. 1 lb. of carraway fruit yields ʒiij to ʒx of oil of sp. g. ·94.

Aq. Cinnamomi is slightly altered in proportions from the B. P. Using the bark we are not so likely to use cassia. Pareira says these barks may be known apart by the iodine reaction, but the oils are not so easily distinguished. 1 lb. of cinnamon yields ʒi to ʒiij of oil, sp. gr. 1·006.

Aq. Fœniculi comes from Scotland; possibly Englishmen are not yet alive to its value, as it is not much in request amongst us. 1 lb. of fennel yields ʒij to ʒvj of oil, sp. gr. ·94.

Aq. Laurocerasi has been investigated by Draper, Pooley and others, it is one of the most uncertain articles in the Pharmacopœia. Draper advised standardizing its hydrocyanic acid; a weak solution of hydrocyanic and sulphuric acids has been praised by others; some say make a stronger water and dilute when wanted, others omit the maceration process; so altogether it is a dangerous and uncertain article. The oil varies from ·06 to ·6 per cent. (Umney).

Aq. Menth. Pip. and Aq. Menth. Vir. represent the Labiates; they are the only waters made from oils, as recommended by Haselden, and are improvements on the herb-distilled waters of the P. L. The oil should be divided by trituration with some solid before it is put in the still.

Aq. Pimentæ has been reduced $\frac{1}{8}$th, that is, 2 oz. less pimento to the gallon. A thin layer of oil lies at the bottom of the water; this opaque water becomes clearer by age and deposits crystals, to be afterwards noticed. 1 lb. of the berries yields ʒij to ʒv of oil, sp. gr. 1·02.

Aq. Rosæ, ordered to be made from rose petals, is often made with otto or rose geranium oil. Real otto is a scarce article, 100 lb. of petals yielding less than ʒiij of solid otto fusing at 86°. To the salt process I shall refer presently.

The last water of the Pharmacopœia is Aq. Flor. Sambuci; this, as well as aq. rosæ, the B. P. allows to be made from the salted flowers. I have found the use of salt unsatisfactory and injurious. Often after salting and keeping in a cool dry place, I have found that before the next flower-season came round an odour of chlorine and sawdust was developed by distillation. The metal still was corroded; the water smelt like a dilute solution of chlorine and precipitated argentic nitrate; I therefore discontinued the salting process, and distilled a stronger water and diluted it when wanted. This water I have found to keep; I have some two years old. Elder flowers yield scarcely ·32 per cent. of a volatile oil slightly lighter than water, yellow, solid, and with a powerful smell of elder-flowers even when largely diluted.

These are the waters of the Pharmacopœia,—lime water is among the liquors,—the B.P. definition of waters evidently being solutions of essential oils in water. Why is aq. pulegii omitted? It is wanted as much as some that are official. Standard forms are also wanted for aq. anisi and caryophylli.

When first made, many of these waters are harsh and musty, but by keeping they mellow down. What is the cause of this? Returning to what I noticed in aq. destillata, has there been any of that slow but surely oxidizing force of water at work on these aqueous solutions of oils? Alcohol has been shown by Warington to change in distilled water to acetic acid. And these essential oils, composed of alcohols and camphors, probably succumb to the same influences. At the bottom of such waters as aq. pimentæ and aq. cinnamomi resinous matter has often been noticed. But what is resin? The term is as correct chemically as copperas for ferri sulph.; it is only a generic name for a series of acids probably oxidized from oils. This goes a long way to show that essential oils are changed as well as alcohol. By which of the compounds in the oils is the resin yielded—the alcohol, the camphor, or both? But resinification or change commencing, what is to hinder the new product modifying or etherifying the remainder? Such action would, in the case of a water, be slow and small in quantity, but such a rearrangement of matter would remarkably alter some of the characteristics of the oil and water. In the laboratory it may be difficult to acidify some of these oils, but to acidify quickly and completely is one thing, to acidify or modify small quantities in the presence and by the aid of powerful agents constantly at work is another; some action, we know, takes place which mellows the waters as they are kept after distillation. So much for what is in solution. These waters should always have a superstratum of oil (except, of course, pimento and cinnamon) floating on them, as Haselden suggested; adding also that such oil is as good as the original oil. So it is, but I have sometimes noticed an oleographic difference. After long contact with water the oil drop does not give so good a "roll," and the figure is slightly altered and slower in its formation. Between the oil and the water there is always a muddy layer. A great deal of this is *débris*, or matter floated over by the steam, as well as the results of changes in the water. On examining these formations microscopically, I have sometimes noticed small crystalline forms, which, when carefully separated, easily melt, and give an odour resembling the essential oil used. These crystals, as in cinnamon, pimento, caryoph., and menth. pip., have been nearly colourless, few in number, only seen with high powers and possessed of polarizing properties. Are these the hydrates of a portion of oil similar to turpine hydrate? and if so, may not a hydration of the oil, especially of that dissolved, materially assist in maturing these waters? These are subjects opening a wide field of research from what appears a very simple subject.

Lastly, the modes of preparing medicinal waters require attention; the only authorized plan in B. P. is distillation (except in the instance of camphor). The first conclusion one draws from these notes is, that spirituous essences are objectionable; they make clear waters, but the result of oxidizing alcohol is acetic acid. This was found to be the fact by Warington in 1845, and every observer since has confirmed the fact. In rejecting the Dublin form for waters, the compilers of the Pharmacopœia were wise and justified by these facts. Oils have been rubbed down with magnesia and chalk; these, too, are objectionable, as soaps are formed as pointed out by Brady and Attfield; the water also acquires an unpleasant odour. Silex, according to the old London Pharmacopœia, and kaolin, or fine clay, as suggested by others, have been used for dividing the oil with variable results.

I find that if a small tube, containing an essential oil, is placed in water in a position opposite to the specific gravity of the oil, and the ends of the tube are closed with membrane, vegetable parchment, etc., exosmosis of the oil commences, and in twenty-four or forty-eight hours the water is saturated, and may be drawn off and replaced by a fresh portion. I do not propose this as a plan in opposition to distillation, it is too long in operation perhaps, but as a convenient way of making those waters only wanted occasionally, and which are frequently made by rubbing down the oil with some other substance.

RESEARCHES ON THE ELECTROLYSIS OF CERTAIN ORGANIC ALKALIES.*

BY M. EDME BURGOIN,

Pharmacien en Chef de l'Hôpital des Enfants-Malades.

Up to the present time but few experiments have been made to determine the action of the electric current upon the alkaloids, and such as have been undertaken have had in view, mainly, the demonstration that these bodies do not owe their birth to the influence of the mineral alkalies employed in their preparation, but pre-exist in the vegetable sources. From the facts observed by Lassaigne and Feneuille in their experiments with delphinine, and the researches of Pelletier and Couerbe upon picrotoxine, the following conclusion has been drawn, namely, that when a salt of an organic alkali is subjected to the influence of the electric current, the acid appears at the positive and the base at the negative pole.

Having continued these imperfect studies, I have recognized that, in addition to the facts noted, there

* This is the article by M. Bourgoin, referred to by the President of the Pharmaceutical Conference in his Introductory Address at Liverpool. The translation is taken from the Chicago *Pharmacist*, and is by the editor of that journal.

always occur secondary reactions, which have heretofore escaped the notice of experimenters.

Note first the action of the current upon the neutral sulphate of ammonia, thus:—

$$SO_3NH_4O = \underbrace{(SO_3 + O)}_{\text{Positive Pole.}} + \underbrace{(NH_4)}_{\text{Negative Pole.}}$$

Then at the positive pole, $(SO_3 + O) + 3HO = SO_3 3HO + O$,* at the negative, $NH_4 = NH_3 + H$.

Bearing this in mind, observe the results of my experiments upon the organic alkalies.

I.—ELECTROLYSIS OF ATROPINE.

Neutral sulphate of atropine. The reaction is very rapid at first, but gradually abates. The negative electrode recovers the pure atropine in very fine crystals,—in fact, the crystals when washed, and dissolved in boiling water, yield a solution which will not give a trace of precipitate when treated with chloride of barium.

At first pure oxygen only is disengaged at the positive pole, but carbonic acid and carbonic oxide soon appear, and at the same time the fluid in the corresponding compartment acquires a distinct yellow colour.

An analysis of the gas after twelve hours gave these results:—

Volume of gas	257	$C_2O_4 = 11$
After the action of KHO_2	246	
„ „ „ the pyrogallate..	14	$O_2 = 232$
„ „ „ „ acid chloride..	1·8	$C_2O_2 = 12·2$

Which gives the composition of the gas:—

Carbonic acid	4·28
Carbonic oxide	4·75
Oxygen	90·66
Nitrogen	0·31†

Secondly.—Acid sulphate of atropine. The decomposition is effected with great energy, and the positive solution acquires at once a fine yellow colour. From the start a mixture of oxygen, carbonic acid, and carbonic oxide is evolved. The experiment being arrested when the crystals of atropine commenced forming upon the negative electrode, the composition of the gas from the positive pole was found to be as follows:—

	After 24 hours.	After 48 hours.
C_2O_4	8·3	7·9
O_2	87·9	88·6
C_2O_2	3·8	8·9
N	——	0·4

At the close of the electrolysis, the positive solution had acquired a magnificent yellow colour, whilst the negative compartment was still colourless. But observe another result, still more remarkable and well worth attention. The positive compartment during the entire series of experiments had the characteristic odour of the essential oil of almonds; on the other hand, the negative liquid, after treatment with caustic potassa, gave abundant white fumes upon the approach of a stick impregnated with hydrochloric acid, showing the presence of ammoniacal compounds, the nature of which remain to be determined by thorough study.

These results are not without interest. They determine, substantially, what I have already announced in another paper, that the secondary phenomena at the positive pole arise from a combustion provoked by the oxygen; and, further, that at the other extremity the current has a single fundamental action—it decomposes a salt, an acid, into two parts, one basic, hydrogen or metal, which goes to the negative pole, while the remaining elements are set at liberty at the positive pole. All the other phenomena are but accessories, and can only be regarded as resulting from the oxidation of organic substances.

But to return to atropine. It is known from the studies of Pfeiffer, Kraut and Ludwig, that atropine, when treated with sulphuric acid and bichromate of potassa, yields benzoic acid. It may be anticipated that this acid, or possibly the essential oil of almonds, may eventually become a source for the derivation of atropine.

II.—ELECTROLYSIS OF BRUCINE.

Neutral sulphate of brucine. The electrolysis of this salt is easily accomplished; after a few moments a beautiful red halo appears around the inferior extremity of the positive electrode. This halo increases little by little until it pervades the compartment, the contents of which eventually become blood-red. It will be observed that this coloration is precisely the same as results from the application of nitric acid to the alkaloid.

There is no gaseous disengagement at the positive pole; it follows that all of the oxygen which is liberated is absorbed, serving to oxidize the brucine, and this is a demonstration that the red coloration is not due to the formation of any nitrogenous compound, but results from direct oxidation.

Secondly.—Acid sulphate of brucine. As soon as the current is established the positive solution acquires a fine red colour; this effect is instantaneous, and this experiment may be useful as a beautiful lecture illustration.

The oxidation is very energetic, and the gas from the first contains carbonic acid.

	First gas.	After 4 hours.	After 24 hrs.
Carbonic acid	4·9	10·6	4·4
Carbonic oxide	6·6	10·9	5·8
Oxygen	87·7	77·9	89·1
Nitrogen	0·8	0·6	0·7

Within twenty-four hours the red coloration gives place to a fine yellow colour, and small crystals commence to appear in the still acid negative compartment. By the fourth day the solution is about exhausted, and the yield of carbonic acid and carbonic oxide is very small. The crystals deposited are hard and granular; after being washed and dissolved in boiling water, their solution is acid to test paper, and gives a precipitate with chloride of barium, showing that acid sulphate of brucine contaminates the crystals. When treated with nitric acid the blood-red colour appears.

III.—ELECTROLYSIS OF STRYCHNINE.

First.—Acid sulphate of strychnine. The saline solution is a poor conductor of the current, so that the decomposition is but slowly effected. Oxygen is disengaged on one side, and hydrogen on the other, and the negative electrode recovers the strychnine in confused crystalline masses.

The positive solution assumes towards the close of the experiments a light yellow colour, indicating oxidation, an oxidation, however, which occurs within circumscribed limits, and does not seem able to take

* See the compilation, 'New Electrolytic Researches,' 1868.

† The nitrogen contained in the gas, and which appears in all of the succeeding analyses, is due to the presence of a small quantity of air which it is almost impossible to guard against.

place until the solution has become acid at the positive pole.

Second.—Neutral sulphate of strychnine. The solution of the sulphate, slightly acidulated, is soon filled with a magnificent needle-form crystallization. From the commencement the gas disengaged at the positive electrode contains carbonic acid and carbonic oxide.

	First Gas.	After 36 hours.
C_2O_4	1·3	1·4
C_2O_2	3·5	2·7
O_2	94·3	95·2
N	0·9	0·7

Upon continuing the experiment a fine yellow coloration manifests itself in the positive compartment, and, what is remarkable, the crystals disappear in the negative solution, the liquid becoming limpid, and remaining so during the continuance of the electrolysis.

When a very acid solution of the sulphate of strychnine is operated upon, the positive solution acquires immediately a yellow colour. The oxidation is very energetic, as may be seen by the following analysis:—

C_2O_4	6·4
C_2O_2	6·4
O_2	87·2

IV.—ELECTROLYSIS OF CODEINE.

First.—Neutral sulphate of codeine. While the escape of gas at the negative pole is quite rapid, it is almost nothing in the other compartment; the contents of the latter acquire a yellow coloration, passing afterwards to an orange-yellow. At the same time crystals of codeine are deposited upon the negative electrode.

Second.—Acid sulphate of codeine. The action is very energetic, the positive solution assuming a magnificent yellow colour, which changes rapidly to an orange-yellow, these phenomena being precisely those observed when the alkaloid is touched with nitric acid. The first bubbles of gas contain carbonic acid and carbonic oxide.

Analysis of Gas after 24 hours.

Volume of the gas	241	$C_2O_4 = 14·5$
After the action of potassa	226·5	
„ „ the pyrogallate	18	$O_2 = 208·5$
„ „ acid chloride	1·5	$C_2O_2 = 16·5$.

From which is deduced:—

C_2O_4	6·0
C_2O_2	6·7
O_2	86·5
N	0·8

V.—ELECTROLYSIS OF QUININE.

The electrolytic experiments which I have made upon the sulphate of quinine, furnished results analogous to the foregoing. It is notable, however, that a neutral solution of the sulphate of quinine is such a poor conductor of the current that decomposition takes place only with the greatest difficulty. From this observation I was led to believe, in the commencement of these researches, that the neutral salts of the alkaloids were not susceptible of electrolytic decomposition. On the contrary, the electrolysis of the acid sulphate is easily accomplished, the positive solution acquires a red tint, which subsequently becomes a deep red, and the gas evolved contains carbonic acid and carbonic oxide.

CONCLUSIONS.

The conclusions drawn from the foregoing experiments may be briefly stated as follows:—

First.—The electric current decomposes the salts of the alkaloids in the same manner that it does the neutral sulphate of ammonia; that is to say, the basic element goes to reconstitute the alkali at the negative pole, whilst the remaining elements are liberated at the positive pole.

Second.—In an acid solution, and in a neutral one with more difficulty, the positive liquid takes a coloration which is identical with that obtained by the direct application of nitric acid to the alkaloid, and this is independent of the formation of nitrogenous compounds.

Third.—The gas disengaged at the positive pole contains not only oxygen, but also carbonic acid and carbonic oxide, sometimes in equal volumes.

Fourth.—Besides these gases, there are formed various other products, principally ammoniacal compounds, resulting from the breaking up of the alkaloids under the influence of the oxygen, which produces the effects of a gradual combustion, and this is more energetic in proportion to the increased acidity of the solution.

The last fact is significant of the possibility of deriving the alkaloids from other than the natural sources, as remarked in connection with the electrolysis of atropine.

These experiments assume, therefore, considerable importance, since they may lead to the discovery of facts which some day may result in the synthetical production of the natural organic alkaloids.

Sulphate of Iron has been very successfully employed as a disinfectant of all discharges from the patients of the hospital, and it has been regularly put into the latrines, etc. This salt has the advantage of cheapness as well as most undoubted efficiency. It is extensively made in some parts of China by mixing together small coal and iron pyrites, covering over the mass very securely, and allowing decomposition to take place. After the violent chemical action has ceased the mass is broken up, dissolved in boiling water, and crystallized out in shallow vessels. It is used in various chemical processes, such as the making of the beautifully crystallized K'ing Fen, or calomel, produced by chemical manufacturers in Hankow, but ingeniously adulterated with selenite. Diluted iodine tincture and the ethereal preparation of iodidine have been found the best disinfectants and stimulants for unhealthy surfaces.—*Annual Report of the Hankow Medical Mission, by F. Porter Smith, M.B.*

Liquid Cement.—For cementing glass, crockery, wood, etc., the following compound is recommended:—Six parts of glue, in small pieces, are macerated for several hours in sixteen parts of water; one part of hydrochloric acid and one part and a half of sulphate of zinc are then added, and the mixture is exposed, for ten or twelve hours, to a temperature of 68° or 70° C.—*Pharm. Cent. Halle.*

Cure for Warts.—The best cautery for warts is said to be dichloracetic acid. It must be applied on the sharp point of a stopper made for the purpose, and great caution ought to be observed not to use too much of it, as it will eat a deep hole into the flesh. One application is frequently sufficient to drive away a wart.—*Scientific American.*

Condy's Patent Fluid.—In quoting the article under this title in last week's issue, the source from whence it was taken was omitted. It appeared first in the *Practitioner* for August.

THE BRITISH PHARMACEUTICAL CONFERENCE.

THE DINNER.

On Tuesday evening, after the first meeting of the Conference, the President and officers were entertained by the Local Committee at dinner, at the 'Adelphi Hotel.' The Executive Officers entertained were:—Mr. W. W. Stoddart, F.C.S., F.G.S., Bristol, the President. Mr. H. C. Baildon, Edinburgh; Mr. H. S. Evans, F.C.S., London; Mr. J. Ince, F.L.S., F.C.S., London, Vice-Presidents. Mr. H. B. Brady, F.L.S., F.C.S., Newcastle-on-Tyne, Treasurer. Professor Attfield, Ph.D., F.C.S., London; and Mr. R. Reynolds, F.C.S., Leeds, General Secretaries. Mr. E. Davies, F.C.S., Secretary for Liverpool. Mr. T. Dutton, Secretary for Birkenhead. Committee: Messrs. F. B. Benger, Manchester; S. C. Betty, London; M. Carteighe, F.C.S., London; T. B. Groves, F.C.S., Weymouth; W. Martindale, F.C.S., London; J. F. Robinson, Liverpool; and F. Sutton, F.C.S., Norwich. The Local Committee for Liverpool consists of Mr. J. Abraham, Chairman; Mr. R. Sumner, Vice-Chairman; Mr. J. Shaw, Treasurer; Messrs. H. S. Alpass; G. Barber; T. Britten, J. M. Buck; H. Coupland; F. D. Delf; T. Dod; E. Evans, sen.; W. J. Foulkes; A. T. Horton; W. Jarvis; S. Johnson; C. Jones; A. H. Mason; T. Martin; M. Murphy; J. Pendlebury; A. Redford; C. Sharp; J. Thompson; and J. Woodcock. Mr. J. Abraham occupied the chair, Mr. R. Sumner the vice-chair, and the party numbered upwards of one hundred.

The CHAIRMAN, after the loyal toasts had been honoured, referred to the American Pharmaceutical Association, now holding its nineteenth sitting in the city of Baltimore. It had been suggested to him that they should send a message of friendly greeting to their friends in the West, as under:—"From the President of the British Pharmaceutical Conference, at Liverpool, to the President of the American Pharmaceutical Association, at Baltimore. The most successful meeting ever held, sends hearty fraternal greeting." He then proposed the toast of the evening. That meeting was, he said, the seventh of the British Pharmaceutical Conference. It was an infant which had already, in seven years, grown up to be a giant; and it was so ably represented here that it needed no commendation from him. The very able address delivered that evening by the President, Mr. Stoddart, he was sure well deserved the warmest encomiums he could bestow upon it, and he only wished that any praise of his was better worth receiving. He was sure they would drink with the heartiest goodwill, "The success of the British Pharmaceutical Conference, and the health of Mr. Stoddart, its President."

Mr. STODDART, who was much cheered, said he returned his sincere thanks for the honour just done him in connecting his name with that of the Pharmaceutical Conference of Great Britain, and, as its President, an honour to which he had never thought to aspire. It was with the greatest affection and love that he had seen the Society grow as it had. What he had done for its progress had sprung from a liking for it. It was one of the most useful institutions; and it had done more good, both directly and indirectly, than any ever established for the furtherance of their interest for many a long year. He did not expect to see, in his time, the total benefit capable of being derived from the institution; but he looked forward with much pleasure, prophetically speaking, to the incalculable benefits which the younger members of the Society would derive. The advice given by the older members was given with hearty good will, and for the welfare of the younger members. The time would come when they would be thankful for the days when the British Pharmaceutical Conference had sprung from the ideas of a few at Newcastle-upon-Tyne, followed as it had been by the meeting at Bath, and those which had annually succeeded it down to the Conference at Liverpool.

Mr. R. SUMNER proposed "Prosperity to the Pharmaceutical Society," and associated with the toast the name of Mr. Sandford, the President of the Society. This toast was very warmly received, and

Mr. SANDFORD, in response, said the business of the Conference should be pharmacy, pure and proper. The Society had other business in which that Conference could help it. It had the duty of advancing pharmaceutical education, and he hoped it had not neglected that duty, and that the time might come when it might do it more extensively than it had done hitherto—when it might support pharmaceutical schools, not only in London but in the country. It would be the endeavour of the Society to carry out faithfully the duties put upon it by the Government. The members had the matter in their own hands, and so long as they used their powers properly they would have the support of the Government. The Conference had it in its power to promote that very much. To the Conference a great deal might be due for the passing of the Pharmacy Act. It was, therefore, with great pleasure that he had heard the chairman speak so highly of the Pharmaceutical Society. As for himself, he returned thanks for personal kindness to him, and he hoped the Conference would long continue to be the prosperous body it now seemed to be.

Professor ATTFIELD proposed "Success to the Liverpool Chemists' Association," the most important Association of the kind throughout the country. In 1849 Jacob Bell came to Liverpool to urge the claims of the Pharmaceutical Society, and one of the results of his visit was the formation of the Liverpool Chemists' Association. Jacob Bell characterized Liverpool as "a collection of men than whom there is not a man in the country having a greater amount of public spirit and energy." The same public spirit had characterized the chemists and druggists of Liverpool from that time to the present. In the index to the 'PHARMACEUTICAL JOURNAL' would be seen a very large number of titles of lectures and papers contributed from Liverpool, and the character of the papers was unequalled by any given to the parent society in London. The present Conference exhibited the same characteristic spirit and energy.

Mr. J. F. ROBINSON and Mr. J. SHAW responded.

Mr. A. REDFORD proposed "The Officers of the Conference," coupled with the names of Mr. Brady, Mr. Reynolds, and Professor Attfield.

Mr. BRADY expressed his regret that after seven years' duty he felt compelled to resign the office of treasurer, but he hoped that the Conference would not suffer, and that there would be no difficulty in finding a successor.

Mr. REYNOLDS and Professor ATTFIELD also replied.

Mr. STODDART acknowledged "the glorious reception" which the Conference had met with at the hands of the people of Liverpool, and proposed "The Local Committee," coupled with the names of Mr. E. Davies and Mr. Mason.

Mr. E. DAVIES and Mr. A. H. MASON responded, and expressed their gratification that their efforts in connection with the exhibition had met with such approval.

The CHAIRMAN announced that, although he was surrounded by the most brilliant array of pharmaceutical talent ever assembled in the provinces, he had received letters of apology from Mr. Henry Deane, Mr. Daniel Hanbury, Professor Bentley, Mr. Hill, Mr. Schacht, Mr. Cooper (of Exeter), and other prominent members of the Conference. He proposed "The Visitors."

Mr. GROVES, of Weymouth, and Mr. MACKAY, of Edinburgh, responded.

Mr. R. SUMNER proposed "Professor Archer, of Edinburgh," whose health was received with much applause.

The toast of "The Pharmaceutical Press," coupled with the names of Mr. Paul, editor of the *Pharmaceutical Journal*, Mr. Brough, editor of the *Pharmaceutical Year-Book*, and Mr. Wootton, editor of the *Chemist and Druggist*, together with other toasts, followed before the party separated.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 24, 1870.

THE BRITISH ASSOCIATION.

The Parliament of Science that has been holding its annual session at Liverpool during the last week will by this time have been prorogued, and the opportunity it affords for communicating an impulse to scientific research, or for giving a scientific direction to various practical affairs, will have passed by for the present. There has been no lack of interesting topics for discussion in the several sections, while the addresses have been perhaps more than usually attractive, both as regards their subject-matter, and by reason of their authorship. Professor Huxley's historical review of the ideas connected with the doctrines of spontaneous generation could scarcely have been so successful in other hands than his; and the task of treating upon the imagination as an instrument of scientific research, could scarcely have been entrusted to any one more fitted to do justice to this theme than Professor Tyndall. The elucidation of scientific principles connected with ship-building, and the discussion of savage conditions of our ancestry, could not have been dealt with more appropriately than at the hands of Rankine and Lubbock.

The proximity of Liverpool to the smoky districts of St. Helen's and Widnes, the chief seats of the Lancashire chemical trade, was a sufficient reason for the presence of a large number of chemists at this meeting, and for the preponderance of papers relating to chemical manufactures. These papers have in several instances given rise to valuable discussions, besides being in themselves of great interest.

But that feature of the Association meeting which is probably at once the most beneficial and pleasant, viz. the excursions, has this year been especially developed in the chemical section of the Association and the Conference meeting. Last week the members of the Pharmaceutical Conference paid a visit to the Chemical Works at Widnes and Runcorn, where they inspected several new methods, and were afterwards very hospitably entertained by the Liverpool Chemists at Halton Castle. Two days after, the chemical section of the British Association made an excursion to St. Helen's, and, on Thursday, there was another excursion to Widnes. There were, on these occasions, so many interesting operations to be seen, that we are compelled to defer attempting any description of them for the present. But at the same time we cannot omit calling attention to the advantages resulting from these excursions. Apart from the mere instruction they afford, there is no phase of the proceedings of the Association or the Conference which is more calculated to promote good feeling amongst pharmaceutists throughout the country, by rubbing down individual asperities that have often no other ground for existence than what Professor Tyndall would call an unscientific use of the imagination. They also afford a stimulus to thought and an incentive to exertion, which probably could not be obtained in any other way so effectually or so agreeably. We have here spoken of the Conference together with the British Association, for the two are intimately related; and the founders as well as the supporters of the Association, should regard with pride and satisfaction such a realization of their objects as is presented by the British Pharmaceutical Conference.

THE SCHOOL OF PHARMACY.

Now that the scientific meetings in the provinces are nearly over, attention will naturally be directed to the addresses to students at the opening of the various schools in London. To pharmacists the most interesting of these will doubtless be that to be delivered at the commencement of the session in Bloomsbury Square. Mr. Schacht has been chosen by the Council this year to deliver the inaugural address on the occasion of the opening of the session, when the prizes and certificates awarded to the successful students of the past session will be distributed. He is well known for his efforts in favour of improved pharmaceutical education, and as one of those who were first to avail themselves of the educational advantages provided by the Society some twenty-five years ago, his words of advice will have great weight. The Council, in inviting the attendance of gentlemen connected with the Society, has been pleased to extend the invitation to ladies. We hope that a hearty response will be made, and that a very successful meeting will be the result.

A letter was read before the Chemical section of the British Association, which had been addressed to it on behalf of the Council of the German Chemical Society of Berlin by Professors C. A. Martius and A. W. Hofmann. The letter pointed out the great urgency for promptly doing something to counteract the effects of the overcrowding of the sick and wounded in the hospitals, and asked the co-operation of the section in obtaining from chemical manufacturers donations of the following disinfectants:—liquid residues of the manufacture of chlorine, chloride of lime, green vitriol, permanganate of potash, and carbolic acid (crude and purified).

Communications on the subject are to be addressed to Professor Hofmann, care of Dr. Wichelhaus, 33, Georgens Strasse, Berlin.

We think it right, in connection with this subject, to refer to the paper we extracted last week from our contemporary the *Practitioner*, showing the relative chemical value of the various materials which owe their disinfecting qualities to permanganic acid. From the results there stated, it will be evident that for transport great advantages are offered by the solid permanganates over solutions, containing in some instances only very small amounts of the active disinfecting material. To chemists this fact would of course be obvious, but we think it worth while to mention the matter here for general information, more especially since permanganates are now manufactured in quantity and at prices which would have been regarded as fabulously low some few years ago.

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

The following contributions have been received since last week:—

	£.	s.	d.
"Canny," Newcastle	0	5	0
R. C. Carruthers, 1, Egerton Crescent, Withington	0	2	6
D. F. Davis, Leominster	0	10	0
John Mason, Bournemouth	0	10	0
W. H. Mathew, Fore Street, Saltash	0	5	0
T. Mathias, Saundersfoot	0	10	0
J. Noad, Turnham Green	0	2	6
W. B. Place, Betley, Crewe	0	5	0

Collections per Mr. T. S. Higgins, Local Secretary, Huddersfield:—

	£.	s.	d.	
R. H. Abbey	0	10	0	
W. T. Bygott	0	5	0	
W. Chrispin	0	10	0	
Ralph Cuthbert	0	10	0	
R. Fell	0	10	6	
Fryer and King	1	1	0	
George Hall	0	10	0	
C. H. Swift	0	2	6	
Wheatley and Higgins	1	1	0	
				£5 0 0

Collections per Mr. B. Shaw, Local Secretary, Halifax:—

	£.	s.	d.	
A. Bancroft, Halifax	0	5	0	
J. Brearley ,,	0	5	0	
H. Brearley ,,	0	5	0	
J. B. Brearley ,,	0	5	0	
W. Brook ,,	0	5	0	
N. R. Burgin ,,	0	5	0	
C. H. Denton ,,	0	5	0	
W. Dyer ,,	0	5	0	
James Farr ,,	0	5	0	
W. C. Hebden ,,	0	5	0	
J. J. Holroyd ,,	0	5	0	
J. Jessop ,,	0	5	0	
W. Oldroyd ,,	0	5	0	
J. Oldroyd ,,	0	2	6	
J. Pollard ,,	0	5	0	
B. Shaw ,,	0	5	0	
B. Wood ,,	0	5	0	
L. Woodhead ,,	0	5	0	
W. Stott, Sowerby Bridge	0	5	0	
S. Cardwell, Brighouse	0	5	0	
J. Chappell ,,	0	5	0	
W. H. Pollard ,,	0	5	0	
G. Hodson, Elland	0	5	0	
W. Kay, Staniland	0	5	0	
				£5 17 6

Samuel Negus, Northampton.
2 lbs. sponges.

John Beddard, 46, Churton Street, Belgrave Road.
40 doz. 2 gr. quinine pills.
6 ,, small sponges.
1 ,, bottles smelling salts.
1 ,, 4 oz. bottles sal volatile.
14 ,, calico bandages.
2½ ,, flannel bandages.
22 yards wadding.
44 ,, flannel.
2 lbs. lint.
2 sets arm splints.
2 ,, leg splints.
2 tins extract of meat biscuits.

E. C. Cosway, 19, Notting Hill Terrace.
2 lbs. lint.

M. P. S., Weymouth.
½ doz. 1 oz. bottles chlorodyne.
½ ,, ½ oz. ditto.
6 ,, 15 gr. compound kino powders.
Some bandages.

E. R. Ing, Swindon.
30 lbs. arrowroot.
1 lb. lint.
1 oz. quinine.
4 ,, Calvert's best carbolic acid.

George Baxter, Chester.
2 gross 1 gr. opium pills.
2 ,, ¼ gr. morphia pills.
2 ,, 2 gr. quinine pills.
2 oz. hydrate of chloral.
4 ,, chloroform.
8 ,, sal volatile.
½ doz. Condy's fluid.
½ ,, 2 oz. bottles laudanum.

William Lewin, Plymouth.
1 lb. pure chloroform.
1 ,, methylated chloroform.
1 lb. liq. ammon. in 8 bottles.
8 oz. chlorodyne.
1 gross 2 gr. quinine pills.
1 ,, ¼ gr. muriate of morphia pills.
1 ,, 1 gr. opium pills.
6 lbs. lint.

Septimus Roe, Salisbury.
1 doz. ½ pint bottles Condy's Fluid (Crimson).
1 pint bottle ,, ,, ,,
5 pint bottles ,, ,, (Green).
7 bandages, 2 yards in each.
Surgeons' tow.

The following have been received by the Edinburgh Auxiliary to the National Society from Messrs. Duncan, Flockhart and Co., Robertson and Co., Mr. R. S. Brown, Mr. W. R. Niven, of Edinburgh:—

Valuable donations of chloroform, laudanum, opium, quinine and morphia pills, sal volatile, citrate of magnesia, lint, adhesive plaster, oil-silk, prepared cotton, bandages, etc.

Extract of Calabar Bean.—J. B. Enz recommends the following process for preparing this extract: reduce the bean to a moderately fine powder, and macerate in alcohol, sp. gr. ·830, for ten days; then transfer the powder to a percolator and pass through alcohol until the percolate becomes colourless. Mix the tincture obtained by maceration with the percolate, distil off the alcohol, and evaporate the residue, over a water bath, to the proper consistence. The yield of extract is about 2 per cent.—*Pharm. Cent. Halle.*

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Tuesday, September 13th.

The following financial statement was put before the meeting by the Treasurer, and adopted:—

The Treasurer in Account with the British Pharmaceutical Conference, 1869–1870.

Dr.		£.	*s.*	*d.*
To cash in hand, August, 1869		79	10	1
,, Sale of 'Proceedings'		0	4	6
,, Interest from London and Westminster Bank		1	1	4
,, 846 Subscriptions, viz.:—				
1 for year ending June 30th, 1865.				
3 ,, ,, ,, 1866.				
16 ,, ,, ,, 1867.				
33 ,, ,, ,, 1868.				
132 ,, ,, ,, 1869.				
509 ,, ,, ,, 1870.				
149 ,, ,, ,, 1871.				
3 ,, ,, ,, 1872.				
(Total 846)		211	10	0
		£292	5	11

Cr.		£.	*s.*	*d.*
By General Printing—				
Taylor and Co.	£39 12 0			
Butler and Tanner	5 1 2			
J. Bell	0 12 6			
		45	5	8
,, Cost of 'Proceedings,' Taylor and Co.	£43 11 6			
,, ,, Compiling Index	1 1 0			
		44	12	6
,, Expenses of Exeter Meeting		5	10	4
,, Advertising		2	4	6
,, Stationery		4	14	2
,, Directing Circulars		4	14	7
,, Postage		49	9	9
,, Various Petty Expenses		1	3	8
,, Bookbinder's Tool for "Bell and Hills" Books		3	0	0
,, 'Year-book of Pharmacy' (Editor's Salary in part)		35	0	0
,, Balance in hand		96	10	9
		£292	5	11

1870.		£.	*s.*	*d.*
August.	Balance in hand	96	10	9
	Estimated Arrears of Subscriptions up to June 30th, 1870 (204 Subscriptions)	51	0	0

Bell and Hills' Library Fund, 1869–70.

	£.	*s.*	*d.*
To Cash received from T. H. Hills, Esq.	52	10	0
By Books forwarded to Exeter	10	10	0
Balance in hand	£42	0	0

Examined and found correct,
JOHN SHAW.
JOSEPH F. ROBINSON.

Liverpool, September 5th, 1870.

The TREASURER explained that he was reluctantly compelled to look to the resignation of his office, especially since the large accession to the numbers of the Conference would add very materially to the duties which he felt he had not the time to perform. He would be glad to retire to the ranks of the Conference, and continue in that position to do his best to serve its interests.

Mr. EKIN (Bath) much regretted to hear this announcement from their friend Mr. Brady, and thought that it suggested they ought to elect a paid officer to assist both the Treasurer and the General Secretary.

The PRESIDENT said that Mr. Ekin's suggestion should be considered at a later stage of the proceedings.

Mr. DYMOND moved that the following members form a committee to report on the exhibition of objects relating to pharmacy:—Messrs. Carteighe, Davies, Ekin, Ince, Paul, Sutton.

This resolution was seconded by Mr. GREENISH, and carried unanimously.

The following papers were then read:—

THE PURITY OF THE YELLOW BEESWAX OF PHARMACY.

BY EDWARD DAVIES, F.C.S.

In this paper I am only able to give the result of the examination of some samples of wax purchased in Liverpool, five samples of crude wax obtained from a wholesale house, and four samples sent to me for analysis from a Liverpool firm, of the history of which I am ignorant.

I shall first give the methods employed, then a table of the results and conclude with a few remarks. The melting-point presents a little difficulty, and, after trying various methods, it was found better to take the solidifying-point. A test-tube containing about 100 grains of wax was immersed in hot water in a beaker until perfectly melted. A thermometer was inserted in the tube and the water allowed to cool gradually, the wax being constantly stirred until the bulb of the thermometer could not be seen when in the middle of the wax. The temperature then remains steady during the solidification for about two minutes, and there is no difficulty in getting the same result any number of times within half a degree.

The presence of paraffin is shown by the low melting-point, but no idea of its amount can be obtained from the degree shown, owing to the varying melting-points of different samples of paraffin. The only method of determining the amount of paraffin found at all practical, consists in destroying the wax with fuming sulphuric acid. 50 grains of the wax, with $1\frac{1}{2}$ oz. by measure of fuming sulphuric acid, are put into a small beaker holding about 5 oz., and gradually heated in a water-bath. Great care must be taken to stir it very slightly at first, especially if only a small quantity of paraffin is present, as the action is apt to become unmanageable. When the violence of the action is over, the heat is raised to 100° C. for about an hour and a half and the mixture occasionally stirred. It is then left to cool very slowly in the water-bath, and, when quite cold, the paraffin will be found forming a layer on the black semi-liquid mass. It is carefully removed, washed with water to remove as much of the adhering acid as possible, dried, and again heated for an hour in a smaller beaker with $\frac{1}{2}$ oz. of the acid. This gives the paraffin perfectly white, and it is then washed, dried, and weighed. There can be no doubt that there is some loss, as the common paraffin employed contains colouring matters destroyed by the acid; but I know of no other method at all useful, though I have carefully tried some which have been proposed.

For the estimation of rosin, the action of cold alcohol seems sufficient. To 90 grains of pure wax, 10 grains of rosin were added, by melting them together and thoroughly incorporating. On exhausting with cold alcohol, by rubbing the wax in a mortar with successive small portions of alcohol, filtering, and evaporating on a water-bath, a residue was obtained weighing 10·54 grains. It was brittle and, when heated, gave an unmistakable smell of rosin. Pure wax yields 2·4 per cent. to cold alcohol, and rosin is not entirely soluble, but one of these about balances the other.

No starch was found in any of the samples, and they were all perfectly soluble in turpentine.

Specimens.	Solidifying Point.	Soluble in Alcohol.	Paraffin.
Pure Scotch wax..........	151·5	2·4 p.c.	none
Crude wax, Gambia	152·5	3·10	not tested
" " No. 1....	154·0	2·40	"
" " No. 2....	153·0	3·60	"
" " No. 3....	147·5	......	"
" " No. 4....	147·0	......	"
" " No. 5....	146·0	......	none
Purchased samples, No. 1 ..	153·5	1·8 p.c.	not tested
" " No. 2 ..	153·0	2·28	"
" " No. 3 ..	152·0	3·18	"
" " No. 4 ..	152·0	2·34	"
" " No. 5 ..	150·5	5·20	"
" " No. 6 ..	147·0	......	"
" " No. 7 ..	145·0	......	none
" " No. 8 ..	139·0	......	13·30
" " No. 9 ..	137·5	......	36·60
Samples sent for analysis, No. 1	142·0	......	42·60
" " No. 2..	140·0	......	43·36
" " No. 3..	135·0	......	56·50
" " No. 4..	134·0	......	56·00

These results show that the degree given in the P. B. of 140° F. is too low; pure yellow wax melts at 151·5° F., and no sample, not containing paraffin, has a melting-point below 145°. I think that 150° should be the standard, for samples containing more than 40 per cent. of paraffine may be made to agree with the Pharmacopœia standard, if a paraffin with a sufficiently high fusing-point be selected. The question may seem an unimportant one, but a difference of 16° in the fusing-point of two samples of wax must considerably affect the quality of ointment made from them, especially in hot weather.

The effect of the application of paraffin to the skin, though probably not injurious, is not sufficiently known to render its presence a matter of indifference. Most of the samples were bought in the lower parts of the town, and the results show that in Liverpool there is not much cause to complain. I have to thank Mr. Thomas Williams for valuable assistance in working out the above results.

The Chairman said that the fatty material referred to by Mr. Davies might probably be stearin, which was used in the neighbourhood of Bristol for adulterating wax sometimes to the extent of fifteen or twenty per cent. He had found as the result of experience that if there was a crack about an inch from the upper edge of the cake, together with a greasy appearance, these characters indicated the presence of stearine.

Professor Attfield remarked that this was an interesting practical paper, and that the results were in favour of his suggestion that the melting-point assigned to beeswax in the Pharmacopœia should be raised ten degrees above the number now given. Some discussion took place as to the mode of determining the melting- or rather solidifying-point of wax and similar materials.

Mr. Groves (Weymouth) pointed out that a difference of ten degrees in the result of experiment might be due to the method adopted. He recommended dipping a thermometer bulb in the melted wax, and after the film of wax had solidified upon the bulb, suspending the thermometer in water, which was gradually heated until the film of wax became transparent and liquid; then reading off the temperature at which this took place as the melting-point.

It was also mentioned that the presence of Japan wax would render the melting-point of beeswax low, but no known means seemed to be available for detecting th's admixture, except the occurrence of that kind of bloom on the surface of the wax so adulterated, which is characteristic of Japan wax itself, as stated by Mr. Parkinson, Ph.D., Bradford.

Mr. Davies said that he had found that pure wax, when melting, passes suddenly from the opaque to the transparent condition, but that when paraffin was present the transition was gradual.

Mr. Brady (Newcastle) recommended that as this was a subject of much pharmaceutical interest, well-authenticated samples of wax should be sent to Mr. Davies for examination, and that he should be requested to continue his inquiries so as to report on the subject at a future meeting of the Conference.

Saccharo-Chirettine, a New Preparation of Chiretta.

BY MR. D. S. KEMP, BOMBAY.

The two official preparations of Chiretta, the *tincture* and the *infusion*, although efficient as containing the active matter of the drug, present inconveniences for habitual administration. The *tincture* becomes impaired in strength by keeping, and is partially incompatible with salts of iron and of the alkaloids; and the infusion, besides having the same incompatibilities, will not keep longer than a few hours.

The *Extract*, prepared in the usual way, is a still more unsatisfactory preparation, containing, as it does, a mere fractional part of the bitter originally in the dried plant. I have not seen an extract of chiretta prepared entirely *in vacuo;* probably such would be a valuable product, although still liable to deterioration. No preparation can, in my opinion, be good which undergoes evaporation by heat or exposure to the air, as I have always found that the bitter principle in such a process disappears, and is replaced by a tasteless brown resinous matter, separating from the aqueous solution. The following is the process by which I have succeeded in obtaining a trustworthy preparation of chiretta:—

An infusion of chiretta was made at 120°, and the colouring matter precipitated by an excess of solution of subacetate of lead; the product, after filtration, was a nearly colourless but very bitter liquid. The addition of a sufficiency of ammonio-acetate of lead (mixture of ammonia and solution of acetate of lead) then produced a white precipitate, consisting of the whole of the chirettine in combination with lead. The precipitate being well washed, first with ammoniacal water, then with alcohol, was treated with a mixture of sulphuric acid and alcohol and filtered. The filtrate containing the chirettine was further treated with carbonate of lime to remove the excess of acid. The filtered liquid, which was of indescribable bitterness, I had no means of subjecting to more appropriate evaporation than spreading out on a clean glass plate; the result being a transparent extract, pale yellow in colour, dry at first, but in time becoming moist. This product I consider to be impure chirettine; and the same has always resulted when modifications of the above process were tried.

It is a neutral substance, quite soluble in water and alcohol. Its aqueous solution, when evaporated in the air, deposits a tasteless brown resin, into which the chirettine becomes entirely converted if the evaporation is continued to dryness. It is very difficult to preserve the pure solution at all from this change; if aqueous, it deposits the resin; if alcoholic, it darkens in colour. But the addition of glycerine will preserve either solutions apparently unchanged for many months. Dilute acids do not affect chirettine; but liquor potassæ hastens its conversion into resin.

I now prepare two pharmaceutical forms of chiretta founded on this process, one, saccharo-chirettine, a dry product; the other, liquor chirettine, a liquid.

Saccharo-chirettine.—To prepare this, I follow the process above described with an economical modification, namely, instead of drying the chirettine, I add to its pure solution a proportion of sugar (20 lb. for each 60 lb. of chiretta used), dry the whole by gentle evaporation, and powder it. The quantity of bitter principle present causes quite a minute increase in the weight of the product, which is, notwithstanding, so bitter that 1 grain is perceptible in a gallon of water.

When well prepared, in a dry atmosphere, saccharo-chirettine is nearly white. It forms a clean solution with water, and in portability and handiness for administration I submit that it is a most convenient pharmaceutic form of the drug it represents. The strength of saccharo-chirettine is as one to three of the herb; 10 grains being equal to 30 grains of chiretta, or about 2½ fluid ounces of infusion. It is given as an antiperiodic in doses of 10 to 15 grains, three times daily, and here, in Bombay, considered equal to 3 to 5 grains of quinine.

A decided advantage that can be given it over chiretta is that some uniformity of strength can be guaranteed by regulating the quantity of sugar used according to the proportion of ammonio-acetate of lead required to precipitate the chirettine.

That chiretta varies considerably in strength I have found by experience.

The Chairman stated that he had not found the tincture of chiretta give any deposit on keeping in this country. Probably the difference in this respect might be due to climate.

Professor Attfield remarked on the peculiarity of the active principle of chiretta in undergoing decomposition when its solution was evaporated, as being a character worth examination from a chemical point of view, as well as in its bearing on the making of pharmaceutical preparations of chiretta.

Mr. Groves approved highly of the principle on which the manufacture of saccharo-chirettine was based. He also thought that the satisfactory results obtained by the author in this instance seemed to show the wisdom of using sugar in certain pharmaceutical preparations as a preservative, and he referred to the old practice of preparing medicines in the form of troches, etc., as one probably useful on that account, which might with benefit be reverted to in our day, especially in the case of medicines destined for export to foreign countries.

The Strength of Twenty-four Specimens of Saccharated Carbonate of Iron.

BY J. J. NICHOLSON, SUNDERLAND.

I have recently had occasion to examine several samples of saccharated carbonate of iron, and have been struck with the great difference in their composition. It is surprising that so great a diversity should exist, for the process of manufacture is exceedingly simple, although a certain amount of care is necessary to secure a good and permanent preparation.

However, the result of my examination shows a discrepancy which, were the article of a more active nature, would be rather alarming; even as it is, we know what importance is attached to the action of this preparation in many serious cases, and to say the least, it would be well if we could have an article of more uniform strength.

Each of the twenty-four samples I have examined was obtained either by myself or friends from pharmacists of position in their several towns, and nothing can show more plainly how little reliance is to be placed on the saccharated carbonate of iron as a medicine than a glance at the following table, where its strength may be seen to range from No. 1, which contains 41·9 per cent. of carbonate, to No. 24, which only contains 22·6 per cent. The principal cause of this difference, I believe, is to be found in the preparation, which requires care, rapidity, and attention, as when finished and properly dried, the change from keeping is so slow and gradual as to be scarcely worth taking into consideration; and among the samples here shown the oldest have not, by any means, turned out the worst; as, for instance, No. 10, which has been kept in paper for seven years, and yet comes up to the ordinary commercial standard of strength, which Professor Attfield gives in his 'Manual of Chemistry' as 37 per cent.

Table showing amount of real Carbonate of Iron in twenty-four specimens of Saccharated Carbonate of Iron.

	Iron.	Iron in the ferrous state.	Carbonate Iron.	
Ferri Carb. Sacch. ought to contain.	22·0	22·0	45·50	
No. 1	21·0	20·25	41·90	Liverpool.
2	22·4	19·68	40·75	Newcastle.
3	22·4	19·44	40·23	Aberdeen.
4	23·8	18·86	39·10	Nottingham.
5	28·0	18·63	38·58	Sunderland.
6	21·0	18·63	38·58	Liverpool.
7	21·0	18·04	37·36	London.
8	30·8	17·82	36·90	Newcastle.
9	21·7	17·82	36·90	London.
10	28·0	17·82	36·90	Sunderland.
11	19·6	17·22	35·66	London.
12	19·6	17·22	35·66	Edinburgh.
13	22·4	17·00	35·20	Torquay.
14	22·4	17·00	35·20	Belfast.
15	22·4	16·20	33·55	Gloucester.
16	22·4	16·20	33·55	Sunderland.
17	33·6	15·39	31·87	Bristol.
18	18·2	15·39	31·87	Belfast.
19	22·4	14·58	30·19	Harrogate.
20	21·0	13·77	28·50	Liverpool.
21	12·6	12·15	25·16	Sunderland.
22	21·0	11·34	23·48	Nottingham.
23	22·4	11·34	23·48	Aberdeen.
24	25·2	10·92	22·61	Castle Eden.

In No. 13, which was sent to me as a very old sample, only 5·4 per cent. of carbonate has become useless through oxidation. This is not at all above the average quantity lost in the preparation.

No. 24 is known by my informant to have stood thirteen years in a wide-mouthed bottle without a cork, and how many before that, he is not able to say, which probation may certainly be considered a fair trial of its permanence.

The relative age of different samples may be pretty nearly determined by their degree of solubility in dilute hydrochloric acid; those I know to be old have always required a considerable amount of heat for their solution, while a recently prepared specimen will dissolve in acid of the same strength at ordinary temperatures. I think it is shown by these examples that the sugar is a very efficient preservative when the preparation is finished, but during the process there is scarcely a sample that escapes oxidation. Some makers appear to have tried to get over the difficulty by largely increasing the quantity of iron, so as to allow for the oxidation of a considerable portion, as instanced in Nos. 5, 8, 10, 17, where the iron is considerably in excess of the normal quantity, but in these cases the loss has been proportionately great, while in No. 21, where the proportion of iron is much smaller, it has been nearly all preserved in the active ferrous state, the quantity in the ferric form being much less than 1 per cent.

In No. 1 also, the whole, or nearly so, of the carbonate has been preserved, and I think this may be classed as a perfect specimen of *ferri carbonas saccharata*. In all these there are traces of the presence of sulphates, but in none have I found any appreciable quantity.

The PRESIDENT stated that according to his experience the crystallized sugar prepared by the centrifugal process by Messrs. Finzel of Bristol, yielded a better product than was the case when ordinary loaf sugar was used. He attributed this to this sugar retaining less atmospheric air.

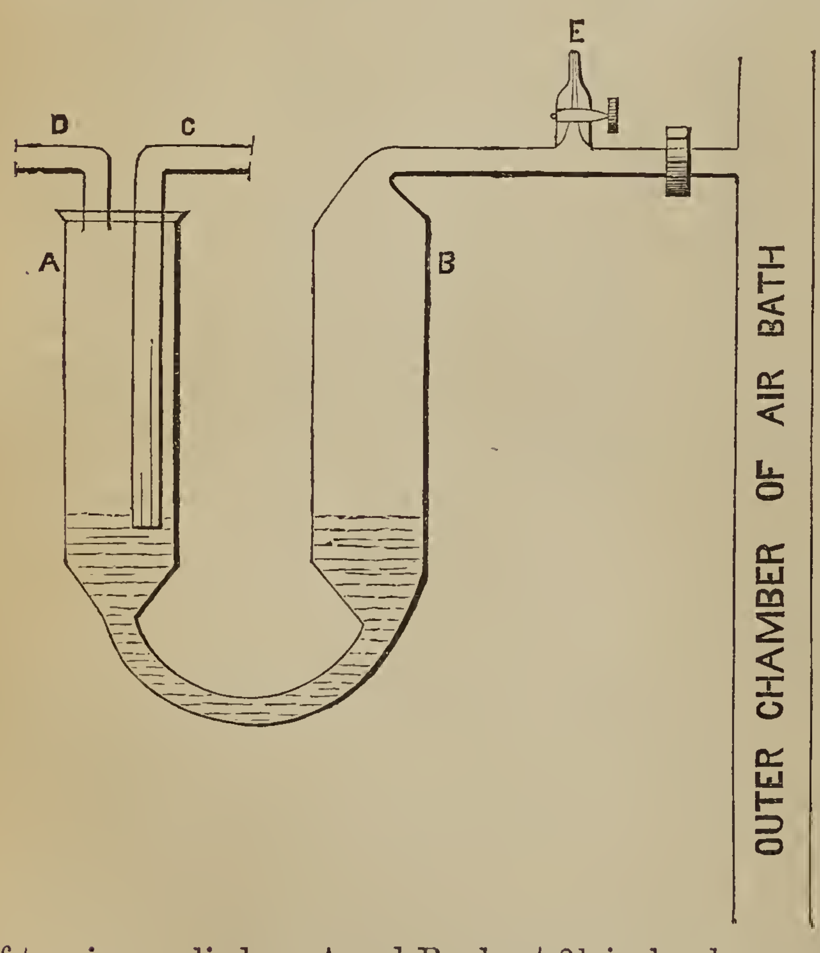
Mr. WILLIAMS said that in his experience he had found the oxidation of the iron-precipitate depended very much on its bulkiness and the amount of liquid mixed with it. He recommended that it should be made as dense and as free as possible from adherent moisture before mixing it with the sugar. For this purpose, the solutions used should be concentrated, the precipitation effected at the boiling-point, and, after washing the precipitated carbonate, it should be pressed to make it as dry as possible.

Dr. WATTS pointed out the method of the French Codex, in which all the operations involved in the preparation of the carbonate were performed in the presence of sugar, with the object of preventing oxidation.

AN AUTOMATIC REGULATOR FOR MAINTAINING CONSTANT TEMPERATURES IN SOME CHEMICAL AND PHARMACEUTICAL OPERATIONS.

BY F. BADEN BENGER.

The advantages claimed for this arrangement are extreme sensitiveness, certainty of action and simplicity of construction; it is applicable to any operation in which gas is used as a source of heat, whenever it is desirable to maintain a constant temperature without continual watching, as in the air-bath or drying closet, fractional distillations, evaporations, etc. The regulator consists



of two iron cylinders, A and B, about 2½ inches long and ¾ inch diameter, communicating with each other at the bottom. Through the movable top of A is passed an iron pipe, C, reaching almost to the bottom, and another, D, going only just through the corner, B is connected by a union-joint with the outer chamber of the air-bath; sufficient mercury is placed in the cylinders to fill the tube connecting them, and to stand about ¼ of an inch above the bottom in each, the outer end of the tube D is now connected with the gas, and that of C with a Bunsen's or other burner placed beneath the air-bath; the air in the outer chamber becoming heated, expands, and pressing on the mercury in B, forces it towards A, where, by rising, it gradually closes the slits in the tube C, and diminishes the supply of gas at the burner; by opening the small tap E, the pressure is immediately removed and the gas again passes freely. When the desired temperature is attained in the drying-chamber, the tap E must be closed, after which the apparatus acts automatically, any slightly higher temperature produced by increased pressure of gas from the "main" or other cause instantly rectifying itself by diminishing the supply at C, whilst cooling by draughts, etc., is at once balanced by a greater flow.

Upon the table are specimens of a drying closet and an evaporating dish, constructed on this principle.*

THE APPRENTICESHIP AND EARLY TRAINING OF PHARMACISTS.

BY F. BADEN BENGER.

The education question being one of the foremost and most important of the day, I trust that a few observations on the early training of those connected with our own vocation may not prove uninteresting to the members of this Conference. It must be evident to all those who have thought seriously on the subject that our present system of apprenticeship is inadequate to the higher standard of scientific education required in our calling. It has answered its purpose in the past, but requires modification to adapt it to the new pharmaceutical era.

Apprenticeships are, for the most part, served in small businesses, where pharmacy proper is subservient, and necessarily so, to less dignified but more remunerative employments. The proprietors are but too glad to add to their scanty incomes the premium received with a pupil, and they maintain the advantage by getting as much as possible out of him in the way of useful service. The leisure of some and the ability of others is too limited to afford much personal instruction or direction in scientific matters to those they have undertaken to instruct in the art and mystery of pharmacy; at the end of his term the youth has, we will assume, gained much useful information connected with his business; has taught his fingers to fold a parcel neatly, and his eye to guess a pennyworth of hair-oil in a Worcester sauce bottle, but in how few cases has he any accurate systematic knowledge of even the elements of chemistry, botany, or materia medica! He then proceeds, at a very small salary, to one of those superior establishments where "neither apprentices nor arsenic are kept on the premises." At length it becomes necessary for him to pass an examination; his knowledge has increased, but it is a disorderly knowledge. If he has worked, he probably feels how much of his precious time he has wasted in working in wrong directions; he finds that, instead of getting, as he expected, more leisure for study as he grows older he gets less, and he sees no other course open to him but to cram under the direction of a professional crammer. A friend who has been prepared by Mr. So-and-so recommends that gentleman's services, and night after night he crams his memory with formulæ, decompositions, diagrams, antidotes, natural orders, and very unnatural methods of keeping certain names and facts within reach for, say, ten days. With these, if he can keep calm, and does not lose his presence of mind at critical moments, he probably gets through. But this large meal of many courses disagrees with a mind not accustomed to generous diet; assimilation does not follow; a reaction takes place, accompanied by a lasting distaste for similar mental food, and by the time the holiday which usually follows a pass is over he has become confused as to his facts, and foggy as to his formulæ, but he thanks his stars that the ordeal is over.

The outline I have given of the studies and opportu-

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* The author claims originality only in what appears to him the main feature of the apparatus, viz. the regulator,—the air in the outer chamber of the bath acting by its expansion and contraction on an india-rubber diaphragm having been suggested as a means of regulating the gas by Mr. W. Dancer, of Cornbrook Chemical Works, and others; but the substitution of the mercurial regulator for the india-rubber valve removes all the difficulties met with in the practical application of the principle.

nities of the apprentices of the period, though happily contradicted by many bright examples, is, I believe, broadly true. Now this system, whilst it swells the ranks of pharmaceutical chemists, and adds to the funds of the Pharmaceutical Society, is not conducive to our real progress. We must remember that the knowledge which will be useful to a man is not that which he possesses on an examination day, but that which he retains afterwards. I think we may take it as a proven fact that very few apprentices do, or even can, qualify themselves during their term. The range of studies has become so wide that very much must be done either before or after, and the advantages of doing it first appear to me many and great. A boy who had received sound elementary instruction in chemistry, botany and materia medica before entering upon his apprenticeship would be to a great extent self-dependent; it would then be entirely his own fault if he did not find daily opportunities of applying and increasing his knowledge; work which would have been mere irksome drudgery to him would be interesting and instructive, because he would find in it the application of principles and laws with which he had previously become familiar.

The next question is, how is this knowledge to be given? I think by the establishment of special technical schools for boys intending to become pharmacists. Mr. Schacht has estimated the number of young men entering the business annually as 1693. Is it too much to expect that a sufficiently large proportion of these to support the experiment would be able and willing to do so? The laboratories at Bloomsbury Square are overflowing; there is no lack of students now ready to spend money for knowledge which they would have found doubly useful if obtained earlier. There is reason to believe that our body will be recruited from a wealthier class than hitherto. A considerable sum will, in most cases, have to be expended one way or another, earlier or later, on the scientific education of the chemist if he is to attain, or, at any rate, to maintain a position, and I think the earlier in his career some of it is invested the better. Moreover, I am disposed to believe that some such plan as I propose would be in the end cheaper as well as better. A pupil having spent twelve months in this technical school would be a much more useful, or at least less troublesome, appendage to most businesses than the apprentice of to-day. Possibly some of the leading firms might be willing to take him at a more moderate premium. At the end of a three years' indenture he should pass the Minor with honours, and would then be certainly able to command higher remuneration than most men who have been four years in the business can now do.

I do not propose any detailed scheme, but make this suggestion in the hope that some of you may be able and willing to help its elaboration. The course of instruction should be elementary, but *thoroughly sound*, the main object being to set up signposts, warranted, as Mr. Ince says, to point in the right direction. When the apprentice sets up his own, they too commonly direct him by supposed short cuts, which lead him into all sorts of tangled difficulties. The teachers in the various departments should be men of real ability and experience. I have not much faith in the educating power of the "certificated science teacher," who is now ubiquitous. Much as we may respect a young man who, in addition to the practice of some honest handicraft, such as shoemaking, lectures on chemistry, botany, and one or two other branches of natural science, to the mechanics and artisans of his neighbourhood, we may doubt if he is the most suitable person to influence boys better educated in ordinary subjects than himself. It is generally admitted that a thorough master of a science is required to impart quickly and accurately the rudiments of his subject, and these are what we want.

The establishment should possess a good museum of drugs and a garden of medicinal plants, and should be under the direction of a thoroughly practical pharmacist. How much might be learned by a boy in such a school in, say, twelve months! It should give him such an impetus as would last whilst he lived. How interesting to him would be the occasional half-hour's stroll in the country, for he should know much of physiological and something of systematic botany by that time! He would pursue his studies with the signposts full in view; and would he make a less successful business man for the scientific bias he had received? I think not. The acquirement of business tact would be just as necessary, but none the more difficult. Amongst the minor advantages to be derived from this proposed year's training may be mentioned the bond of fellowship which would be formed between kindred spirits, and which, thus early established, would greatly tend to the diffusion of pharmaceutical knowledge and the furtherance of the objects aimed at by our own Conference.

If the introduction of this subject brings about a discussion from which any more practical conclusions shall be derived, I have not wasted your time this morning.

The discussion on this paper was postponed until the next day, when the subject of Pharmaceutical Education in the Provinces was to be brought before the Conference at the suggestion of the Council of the Pharmaceutical Society.

The meeting then adjourned at 12.30.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Meeting at Liverpool.

Professor Huxley's inauguration of this scientific parliament has gone off with considerable *éclat* and with general satisfaction. Abstaining from that general retrospective representation of achieved scientific progress, which is so attractive to a man of comprehensive attainments and acute perception, the President has this year confined his address to one special subject. In doing so he has probably been influenced by the fact that the subject chosen is one possessing such stupendous interest as to command attention in any case, while it was certain to do so when treated of by Professor Huxley. The scientific problem of the origin of life has always attracted the consideration of a certain class of philosophic inquirers, and at intervals it has given rise to the enunciation of doctrines that excited violent controversy.

Quite recently, experiments conducted by Dr. Bastian have again brought this subject to the front, and those who are familiar with Professor Huxley's general views or scientific labours will not wonder that he should have selected the germ theory and the correlative question of spontaneous generation as the theme for his inaugural address. Starting with the statement that as a matter of every-day experience it is difficult to prevent articles of food and similar materials from becoming mouldy; that fruit, apparently sound, often contains grubs at the core; that meat, left to itself, is apt to putrefy and swarm with maggots,—Professor Huxley reminded his audience that from the ancients down to the seventeenth century, there was a belief in the proposition that life may and does originate in that which has no life.

But this was merely a belief; it did not rest on any scientific foundation, and Francesco Redi was the first to subject the observations of ordinary experience to scientific criticism. He pointed out that though maggots make their appearance in flesh and similar materials exposed to the air, that was not the case if the flesh was put into a jar covered over with fine gauze, while putrefaction took place just the same. He inferred hence that maggots were not generated by the act of putrefaction, and that the cause of their formation was something which was kept away by the gauze. He showed, moreover, that something to be the eggs deposited by blow-flies. Redi's experiments were extended to many other things besides flesh, always with similar results, and generalizing on them he arrived at the presumption that in all cases of the appearance of life in previously dead material the real explanation of the fact was the introduction of living germs or eggs from without into that dead material. Hence originated the hypothesis of Biogenesis, or what is now termed the germ theory, which may be stated in the aphorism "omne vivum ex vivo." But even in Redi's time there were difficulties in the way of reconciling known facts with that hypothesis, and he candidly admitted them. However, the subsequent progress of microscopic research revealed such a prodigality of provision for multiplication in the lowest and minutest forms of life by germs of some kind that the old belief in spontaneous generation began to appear not only untrue but absurd, and at the middle of last century it was almost universally discredited.

But the aid afforded by the microscope soon reached a limit, and, in some cases where development of life took place, the existence of extremely minute germs had to be assumed in order to make observation accord with the hypothesis of biogenesis. Thus, for instance, an infusion of hay, left for some days, will swarm with living things, among which any one reaching the diameter of $\frac{1}{3200}$th of an inch is a giant. In such cases the microscope was no longer competent to reveal the existence of germs. At that stage Buffon and Needham took up the question whether the development of infusorial animalcules was due to germs or not, and they endeavoured to submit this to a crucial test. Assuming that the vitality of all germs is destroyed by heat, Needham boiled the infusion of hay, corked it up and excluded air; but nevertheless animalcules were developed. Hence he inferred that living germs were not essential for the development of infusoria; still he did not altogether adopt the alternative hypothesis of spontaneous generation, but took refuge in a kind of compromise. Spallanzani followed, by showing that if air was absolutely excluded in Needham's experiment no infusoria were developed. Schulze and Schwann's experiments with air that had been heated to redness gave the same results, but all they proved was that this treatment of air destroyed something essential for the development of life. That something might be gaseous, liquid or solid; but it still remained only an hypothesis that it consisted of germs.

Pasteur was the first to show that by straining air through cotton-wool clearly recognizable germs were retained, that these germs were competent to give rise to living forms in a solution fit for their development, and that the incapacity of air strained through cotton-wool to give rise to life was not due to any occult influence on the constituents of the air. The evidence he obtained as to the existence of myriads of living particles in the air was both directly and indirectly of great weight in favour of Biogenesis. On the other hand, the fact that hermetically-sealed liquids, after being exposed to heat for a long time, have sometimes exhibited slow forms of life, are the only evidence in favour of spontaneous generation. In regard to these instances, they are not invariable in their results, nor do they indicate with certainty spontaneous generation, inasmuch as the resistance of living material to heat varies within considerable limits.

This slender statement of the history of this question given by Professor Huxley in his address, will serve to show that his review was comprehensive and impartial; and the opinions he offered himself are no less so. In the present state of science, the alternative is offered to us of adopting the opinion that germs can stand a greater heat than has been supposed, or of assuming the molecules of dead material to be capable of arranging themselves into living bodies exactly such as can be shown to originate in another way; and it is a strong argument against the doctrine of spontaneous generation to find Professor Huxley declaring that under these circumstances he does not think the choice can be doubtful for a moment. But at the same time he adds, that though he cannot too strongly express that conviction, he guards himself against the supposition of suggesting the impossibility of spontaneous generation. That he considers would be presumption. How far it may be possible to bring together the conditions under which matter assumes the properties we call vital, is a question we cannot yet decide on scientific grounds. Looking back through the prodigious vista of the past, we find no record of the commencement of life that would indicate the conditions of its origin. To say, in the absence of evidence, that we have any belief as to the mode in which existing forms of life originated would be, from a scientific point of view, to use words in a wrong sense. But, in such a case, expectation is permissible where belief is not, and if it were possible to look back beyond the abyss of geologically recorded time to that remote period when the material of the present earth was passing through physical and chemical conditions which it can no more see again than a man can recall his infancy, the man of science might expect to see the solution of living protoplasm from material not living. That is the expectation to which Professor Huxley is led by analogical reasoning, though he begged his audience to recollect that he had no right to call his opinion anything but an act of philosophical faith.

It would be impossible here to follow the President further in his address, than by stating that he dealt with the subject in its relation to epidemic disease, and, in a manner that was deeply interesting, reminded his audience that in regard to this point, the study of a problem, curious to investigators but apparently of no conceivable utility to mankind, had led to the discovery of fields laden with a harvest of golden grain immediately convertible into those things which even the most sordidly practical men admit to be of value,—namely, money and life. The cases he referred to as illustrating this truth, were the silkworm disease, known in France as 'Pébrine,' and the mortality from scarlet fever. He urged these instances as an admonition that "the people perish for lack of knowledge," and that the alleviation of misery as well as the promotion of man's welfare, must be sought in that diligent, patient, loving study of Nature in all its multitudinous aspects, from the results of which we arrive at exact knowledge or science.

On Thursday, the 15th inst., the sections commenced their meetings. In section B, which is devoted to Chemical Science, the President, Professor H. E. Roscoe, delivered the following address:—

Gentlemen,—In the midst of the excitement of the horrible war in which the two most scientific nations of the Continent are now plunged, let us endeavour to turn our thoughts into channels more congenial to the scientific inquirer; and allow me to recount to you, as far as I am able, the peaceful victories which, since our last meeting in Exeter, have been achieved in our special department of chemistry. But first may I be permitted to draw your attention to the fact that whilst, on the one hand, we hear of professors of chemistry and their students volunteering in the humane offices of field-apothecaries or hospital attendants, we learn, on the other hand, that a distinguished chemist has accepted the chairmanship of a scientific committee called together for the express purpose of employing all the resources of modern chemistry in the horrible destruction of their fellow-creatures; for to what do such resources in the last instance amount, but to sudden explosion, fire, or poison? The application of such means in such an age as this cannot surely be justified in any sense either by patriotism or public duty. And yet, in spite of all this, it is, in my mind, mainly to the brotherly intercourse of those interested in science and in its applications to the arts and manufactures in different countries that we must look as the small but living fire, which, in the end, will surely serve to melt down national animosities, and to render impossible the breaking out of disasters so fatal to the progress of science and to the welfare of humanity as that of which we are now, unfortunately, the spectators.

With regard to the position of chemical science at the present moment, it will not take a careful observer long to see that, in spite of the numerous important and brilliant discoveries of which every year has to boast, we are really but very imperfectly acquainted with the fundamental laws which regulate chemical actions, and that our knowledge of the ultimate constitution of matter upon which those laws are based is but of the most elementary nature. In proof of this I need only refer to the different opinions expressed by our leading chemists, in a discussion which lately took place at the Chemical Society on the subject of the atomic theory. The President (Dr. Williamson) delivered a very interesting lecture, in which the existence of atoms was treated as "the very life of chemistry." Dr. Frankland, on the other hand, states that he cannot understand action at a distance between matter separated by a vacuous space; and although generally granting that the atomic theory explains chemical facts, yet he is not to be considered as a blind believer in the theory, or as unwilling to renounce it if anything better presented itself. Sir B. C. Brodie and Dr. Odling both agree that the science of chemistry neither requires nor proves the atomic theory; whilst the former points out that the true basis of this science is to be sought in the investigation of the laws of gaseous combination or the study of the capacity of bodies for heat, rather than in committing ourselves to assertions incapable of proof by chemical means. Agreeing in the main myself with the opinions of the last chemists, and believing that we must well distinguish between fact and theory, I would remind you that Dalton's discovery of the laws of multiple and reciprocal proportions—I use Dr. Odling's word—as well as the differences in the power of hydrogen replacement in hydrochloric acid, water, ammonia, and marsh gas, are facts, whilst the explanation upon the assumption of atoms is, as far as chemistry is as yet advanced, a theory. If, however, the existence of atoms cannot be proved by chemical phenomena, we must remember that the assumption of the atomic theory explains chemical facts as the undulatory theory gives a clear view of the phenomena of light. Thus, for instance, one of the most important facts and relations of modern chemistry which it appears difficult, if not impossible, to explain without the assumption of atoms, is that of isomerism. How, otherwise than by a different arrangement of the single constituent particles, are we to account for several distinct substances in which the proportions of carbon, hydrogen and oxygen are the same? Why, for instance, should forty-eight parts by weight of carbon, ten of hydrogen and sixteen of oxygen united together, be capable of existing as three different chemical substances unless we presuppose a different statical arrangement of the parts by which these differences in the deportment of the whole are rendered possible? If, then, it be true that chemistry cannot give us positive information as to whether matter is infinitely divisible and therefore continuous, or consists of atoms and is discontinuous, we are in some degree assisted in this inquiry by deductions from physical phenomena which have been recently pointed out by the genius of Sir William Thomson. He argues from four different classes of physical phenomena, and comes to the conclusion, not only that matter is discontinuous, and, therefore, that atoms and molecules do exist, but he even attempts to form an idea of the size of these molecules, and he states that in any ordinary liquid, transparent or seemingly opaque solid, the mean distance between the centres of contiguous molecules is less than the hundred millionth, and greater than the two-thousand millionth of a centimetre. Or, to form a conception of this coarse-grainedness, imagine a rain-drop or globe of glass as large as a pea, to be magnified up to the size of the earth, each constituent molecule being magnified in the same proportion; the magnified structure would be coarser-grained than a heap of small shot, but probably less coarse-grained than a heap of cricket balls.

There is, however, another class of physical considerations which render the resistance of indivisible particles more than likely. I refer to the mechanical theory of gases by means of which, thanks to the labours of eminent English and German philosophers, all the physical properties of gases, their equal expansion by heat, the laws of diffusion, the laws of alteration of volume under pressure, can be shown to follow from the simple laws of mechanical motion. This theory, however, presupposes the existence of molecules, and in this direction again we find confirmation of the real existence of Dalton's atoms. Indeed, it has been proved that the average velocity with which the particles of oxygen, nitrogen, or common air are continually projected forward, amounts, at the ordinary atmospheric pressure, to 50,000 centimetres per second, whilst the average number of impacts of each of these molecules is 5000 millions per second. The mention of the molecular motions of gases will recall to the minds of all present the great loss which English science has this year sustained in the death of the discoverer of the laws of gaseous diffusion. Throughout his life Graham's aim was the advancement of our knowledge in the special subject of the molecular properties of gases. With this intent he unceasingly laboured up to the moment of his death, in spite of failing health and pressure of official business, unfolding for posterity some of the most difficult as well as the most interesting secrets of nature in this branch of our science. "What do you think," he writes to Hofmann, "of metallic hydrogen, a white magnetic metal?" And yet now, through his labours, the fact of the condensation of hydrogen in the solid state by metallic palladium, and to a less extent by other metals, has become familiar to all of us. Then, again, I would remind you of Graham's recent discovery of the occlusion of hydrogen gas in certain specimens of meteoric iron, whilst earth-manufactured iron contains not hydrogen but absorbed carbonic oxide gas, proving that the meteorite had probably been thrown out from an atmosphere of incandescent hydrogen existing under very considerable pressure, and therefore confirming in a remarkable degree the conclusions to which spectrum analysis had previously led us. The position in the ranks of British science left by Graham's death will not be easily filled up; he accomplished to a certain extent for dynamical chemistry what Dalton did for statical chemistry, and it is upon his experimental researches in molecular chemistry that Graham's permanent fame as one of England's greatest chemists will rest.

As closely connected with the above subjects, I have next to mention a most important research by Dr. Andrews, of Belfast, which, marking an era in the history of gases, shows us how our oldest and most cherished notions must give way before the touchstone of experiment. No opinion would appear to have been more firmly established than that of the existence of three separate states or conditions of matter, viz. the solid, the liquid and the gaseous. A body capable of existing in two or more of these states was thought to pass suddenly from one to the other by absorption or emission of heat, or by alterations of the superincumbent pressure. Dr. Andrews has shown us how false are our views on this fundamental property of matter, for he has proved that a large number of, and probably all, easily condensable gases or vapours possess a critical point of temperature at and above which no increase of pressure can be made to effect a change into what we call the liquid state, the body remaining as a homogeneous fluid; whilst below this critical temperature certain increase of pressure always effects a separation into two layers of liquid and gaseous matter. Thus, with carbonic acid, the point of critical temperature is 30·92° C., and with each given substance this point is a specific one, each vapour exhibiting rapid changes of volume and flickering movements when the temperature or pressure was changed, but showing no separation into two layers. Under these circumstances, it is impossible to say that the body exists either in the state of a gas or of a liquid; it appears to be in a condition intermediate between the two. Thus, carbonic acid, under the pressure of 108 atmospheres, and at 35·5° C., is reduced to the 1-430th of the volume which it occupies at one atmosphere, it has undergone a regular and unbroken contraction, and it is a uniform fluid: if we now reduce the temperature below 31° C. the liquid condition is assumed without any sudden change of volume or any abrupt evolution of heat. We can scarcely too highly estimate the value of the researches of Andrews.

As examples of the power which modern methods of research give of grappling with questions which only a few years ago were thought to be insoluble, I may quote the beautiful observations, now well known, by which Lockyer determined the rate of motion on the sun's surface, together with those of Frankland and Lockyer respecting the probable pressure acting in the different layers of the solar atmosphere; and lastly, the results obtained by Zöllner, respecting solar physics, and especially the probable absolute temperature of the sun's atmosphere, as well as that of the internal molten mass. These last results are so interesting and remarkable as being arrived at by the combination of recent spectroscopic observation with high mathematical analysis, that I may perhaps be permitted shortly to state them. Starting from the fact of the eruptive nature of a certain class of solar protuberances, Zöllner thinks that the extraordinary rapidity with which these red flames shoot forth proves that the hydrogen of which they are mainly composed must have burst out from under great pressure: and if so, the hydrogen must have been confined by a zone or layer of liquid from which it breaks loose. Assuming the existence of such a layer of incandescent liquid, then applying to the problem the principles and methods of the mechanical theory of gases, and placing in his formulæ the data of pressure and rate of motion as observed by Lockyer on the sun's surface, Zöllner arrives at the conclusion that the difference of pressure needed to produce an explosion capable of projecting a prominence to the height of 3·0 minutes above the sun's surface, a height not unfrequently noticed, is 4,070,000 atmospheres. This enormous pressure is attained at a depth of 139 geographical miles under the sun's surface, or at that of 1-658th part of the sun's semi-diameter. In order to produce this gigantic pressure, the difference in temperature between the enclosed hydrogen and that existing in the solar atmosphere amounts to 74,910° C. In a similar way Zöllner calculates the approximate absolute temperature of the sun's atmosphere, which he finds to be 27,700° C., a temperature about eight times as high as that given by Bunsen for the oxyhydrogen flame, and one at which iron must exist in a permanently gaseous form.

Passing on to more purely chemical subjects, we find this year signalized by the redetermination of a most important series of chemical constants, viz. that of the heat of chemical combination, by Julius Thomsen, of Copenhagen. This conscientious experimentalist asserts that the measurements of the heat evolved by neutralizing acids and bases hitherto considered most correct, viz. those made with a mercury calorimeter by Favre and Silbermann, differ from the truth by 12 per cent., whilst the determination by these experimenters of the heat of solution of salts is frequently 50 per cent. wrong. As the result of his numerous experiments, Thomsen concludes that when a molecule of acid is neutralized by caustic alkali the heat evolved increases nearly proportionally to the quantity of alkali added until this reaches 1, $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$ of a molecule of alkali, according as the acid is mono-, di-, tri-, or tetra- basic. Exceptions to the law are exhibited by silicic, and also partly by boracic, orthophosphoric and arsenic acids. In the two latter the heat of combination is proportional for the two first atoms of replaceable hydrogen, but much less for the third atom. A second unexpected conclusion which Thomsen draws from his calorific determinations is that sulphuretted hydrogen is a monobasic acid, and that its rational formula is therefore HSH.

Another important addition made to chemistry since our last meeting is a new, very powerful and very simple form of galvanic battery, discovered, though not yet described, by Bunsen. In this second Bunsen's battery only one liquid, a mixture of sulphuric and chromic acids, and, therefore, no porous cells, are employed. The plates of zinc and carbon can all be lowered at once into the liquid, and raised again at will. The electromotive force of this battery is to that of Grove—the most powerful of known forms—as 25 to 18; it evolves no fumes in working, and can be used for a very considerable length of time without serious diminution of the strength of the current, so that Bunsen writes me that no one who has once used the new battery will ever think of again employing the old forms. I had hoped to be able to exhibit to the section this important improvement in our means of producing a strong current, but war has demanded the use of other batteries, and Bunsen has been unable to send me a set of his new cells.

Amongst the marked points of interest and progress in inorganic chemistry during the past year, we have to notice the preparation of a missing link amongst the oxysulphur acids by Schützenberger. It is the lowest known, and may be called hydrosulphurous acid, H_2SO_2. The sodium salt, $NaHSO_2$, is obtained by the action of zinc on the bisulphite; as might be expected, it possesses very powerful reducing properties, and bleaches indigo rapidly. The metallic vanadates have also been carefully examined, and the existence of three distinct series of salts proved, corresponding to the phosphates, viz., the ortho- or tribasic vanadates, the pyro- or tetrabasic vanadates, and the meta- or monobasic vanadates. Of these the ortho-salts are most stable at a high temperature, whilst, at the ordinary atmospheric temperature, the meta-salts are most stable. In the phosphorus series, as is well known, the order of stability is the reverse; and thus the points of analogy and of difference between phosphorus and vanadium become gradually apparent.

As an illustration of the results of modern organic research—for in viewing the year's progress in this ever-widening branch of chemistry it is impossible to do more than give a few illustrations—I may quote Baeyer's remarkable investigations on mellitic acid. Originally discovered by Klaproth in honeystone or mellite (a substance which yet remains the only source of the acid), mellitic was supposed to be a four-carbon acid. Baeyer has quite recently shown that the acid contains twelve atoms of carbon, or has a molecular weight three times as great as was originally supposed. He has shown that mellitic acid is benzolhexacarbonic acid, $C_{12}H_6O_{12}$, or benzol in which the six atoms of hydrogen are replaced by the monad radical, carboxyl (COOH); as benzoic is benzol-mono-carbonic acid, or benzol in which one of hydrogen is replaced by carboxyl. The most interesting portion of Baeyer's research, however, lies in the intermediate acids, partly new and partly acids already prepared, which he has shown lie between mellitic and benzoic acid, and in which from one to six atoms of hydrogen in benzol are respectively replaced by carboxyl. Nor is this all, for he has proved that, with two exceptions, each of these six acids is capable of existing in three isomeric modifications, thus giving us an insight into the arrangement of the molecule of these aromatic compounds. For the simplest mode of explaining these numerous isomers is that given by Baeyer in the different order in which the several atoms of hydrogen in the benzol molecule are replaced. Thus, in the first, or ortho series, the hydrogen atoms in benzol, being numbered in regular succession, are replaced in the same regular succession; in the second, or meta series, the order is 1, 2, 3, 5, etc.; whilst the third, or para series, take open order, as 1, 2, 4, 5, etc. Thus we have—

	Ortho series.	Para series.	Meta series.
$C_{12}H_6O_{12}$ Hexa-basic	Mellitic or Benzolhexacarbonic.		
$C_{11}H_6O_{10}$ Penta	Unknown.		
$C_{10}H_6O_8$ Tetra.	Pyromellitic or Benzoltetracarbonic.	Isopyromellitic.	Unknown.
$C_9H_6O_6$ Tri . . .	Trimesinic or Benzoltricarbonic.	Hemimellitic.	Trimellitic.
$C_8H_6O_4$ Di . . .	Phthalic or Benzoldicarbonic.	Isophthalic.	Tetraphthalic.
$C_7H_6O_2$ Mono .	Benzoic or Benzolmonocarbonic.		

Amongst the most interesting series of new organic bodies are those in which tetrad silicon partly replaces carbon. Our knowledge of these substances is gradually becoming more complete; the last new member prepared by Friedel and Ladenburg is silico-propionic acid—

$$\begin{matrix} C_2H_5 \\ SiO_2H \end{matrix}$$

the first of a series of carbo-silicic acids containing the radical SiO_2H. The interesting researches of Matthiessen and Wright on morphine and codeine have thrown a new light on the constitution of these opium alkaloids. Treated with hydrochloric acid morphine loses one molecule of water, and gives rise to a new base called apomorphine, thus:—

$$\underbrace{C_{17}H_{19}NO_3}_{\text{Morphine.}} = H_2O + \underbrace{C_{17}H_{17}NO_2}_{\text{Apomorphine.}},$$

which differs in a remarkable manner from morphine, both in its chemical and physiological actions, being soluble in alcohol, ether and chloroform, whereas morphine is nearly insoluble, and acting as the most powerful emetic known, one-tenth of a grain producing vomiting in less than ten minutes. Codeine, which only differs from morphine by CH_2, also yields apomorphine on treatment, at a high temperature with hydrochloric acid, methyl chloride being at the same time eliminated.

An important application of the dehydrating and carbon-condensing power of zinc chloride, long known in its action on alcohol to produce ether, has been made by Kekulé in the reduplication of aldehyde to form croton aldehyde with loss of water: $2(C_2H_4O)-H_2O=C_4H_6O$. This croton aldehyde is also probably formed as an intermediate product in the manufacture of chloral from aldehyde, and gives rise to the formation of croton chloral, $C_4H_3Cl_3O$.

The discovery of the sedative properties of chloral hydrate by Liebreich marks an era in medical chemistry second only to the discovery of the anæsthetic properties of chloroform. Chloral not only combines with water to form a solid hydrate but also forms solid alcoholates; but these bodies appear to possess quite different medicinal properties from the hydrate, and it is important that no alcoholate should be present in the official preparation.

The chemistry of colouring matters has lately received an enormous impetus in the practical working of the brilliant discovery of the production of artificial alizarine, the colouring matter of madder, by Messrs. Graebe and Liebermann. This discovery, announced at our last meeting, is of the highest importance—whether we regard its scientific interest or its practical and commercial value—and it differs from all the former results which have been brought about by the application of science to the production of colouring matter, inasmuch as this has reference to the artificial production of a natural vegetable colouring substance, which has been used as a dye from time immemorial, and which is still employed in enormous quantities for the production of the pink, purple and black colours which are seen everywhere on printed calicoes. During the past year much progress has been made in the practical working of the processes by which this colouring matter is obtained from the hydrocarbon anthracene contained in coal tar, and new and more economical plans for effecting the transformation have been independently proposed by Perkin and Caro, and Schorlemmer and Dale. The theoretical investigation of the reaction—and especially of the nature of some other peculiar products formed in addition to alizarine, which render the artificial colouring matter different from natural alizarine—has been carried out by Mr. Perkin, and especially by Dr. Schunck. As we are promised papers on this subject from both these gentlemen, I need not at present enter further into these interesting questions.

The surest proof of perfection in a manufacture is the degree in which the waste products are utilized, and in which the processes are made continuous. One by one the imperfections of the original discovery are made to disappear, and the products which were wasted become sources of profit, while in many cases their utilization alone renders possible the continuance of the manufacture in the midst of a rapidly-increasing district. The section will have the opportunity of inspecting the practical working of at least two of the most valuable of these new processes which have lately been introduced into our most important chemical manufacture—that of alkali. The first of these has been at work for some time, it is that of the recovery of sulphur from the vat waste, that *bête noire* of the alkali makers and of their neighbours. Dr. Mond has now, I believe, satisfactorily solved the difficult problem of economically regaining the sulphur by oxidizing the insoluble monosulphide of calcium in the lixiviating vat itself to the soluble hyposulphite, and decomposing this by hydrochloric acid when all the sulphur is deposited as a white powder. The second of these discoveries relates to the recovery or regeneration of the black oxide of manganese used for the evolution of chlorine in the manufacture of bleaching powder. This subject has long attracted the attention of chemists, and a feasible, though somewhat costly, process, that of Dunlop, has been at work for some time at Messrs. Tennant's works at St. Rollox. During the last year a very beautifully simple and economical process proposed by Mr. Weldon, and first successfully carried out on a practical scale at Messrs. Gamble's works at St. Helen's, has quickly obtained recognition, and is now worked by more than thirty-seven firms throughout the kingdom. The principle upon which this process depends was explained by Mr. Weldon at the Exeter meeting. It depends on the fact that although when alone the lower oxides of manganese cannot be oxidized by air and steam under the ordinary pressure to the state of dioxide, yet that this is possible when one molecule of lime is present to each molecule of oxide of manganese. The manganous oxide is precipitated from the still liquors with the above excess of lime, and by the action of steam and air on this, a black powder, consisting of a compound of manganese dioxide and lime, MnO_2CaO, or calcium manganite, is formed. This, of course, is capable of again generating chlorine on addition of hydrochloric acid, and thus the chlorine process is made continuous with a working loss of only $2\frac{3}{4}$ per cent. of manganese. The section will have the advantage of seeing Mond's process at work at Messrs. Hutchinson's, and Weldon's process at Messrs. Gaskell, Deacon and Co.'s, at Widnes. A third process, which may possibly still further revolutionize the manufacture of bleaching powder, is the direct production of chlorine from hydrochloric acid without the use of manganese at all. In presence of oxygen and of certain metallic oxides, such as oxide of copper, hydrochloric acid gas parts at a red heat with all its hydrogen, water and chlorine being formed. This interesting reaction is employed by its discoverer, Mr.

Deacon, for the direct manufacture of bleaching powder from the gases issuing directly from the salt-cake furnace. Air is admitted together with hydrochloric acid gas, and the mixture is passed over red-hot bricks, impregnated with copper salt. The oxide of copper acts as by contact and remains unaltered, whilst the chlorine, watery vapour and excess of air pass at once into the lime chamber. There are many practical difficulties in working this process, some of which have still to be overcome, but I believe we shall hear from Mr. Deacon that, notwithstanding this drawback, he has accomplished his end of making good bleaching-powder by this process.

On the motion of Professor Williamson a vote of thanks was tendered to the President for his address.

Mr. D. Forbes read the Report of the Committee appointed to inquire into the chemical nature of cast iron.

The reading of papers upon the following subjects was then proceeded with:—

A New Chlorine Process without Manganese. By Mr. Henry Deacon.

The Weldon Process for the Manufacture of Chlorine. By Walter Weldon, F.C.S.

Air Pollution from Chemical Works. By Alfred Fletcher, C.E.

Phenomena of the Crystallization of a Double Salt. By J. Berger Spencer, F.C.S.

In the Anatomy and Physiology Department of Section D (Biology) Dr. Richardson read an important report on methyl compounds. With some small aid from the funds of the Association, he has for some years carried on a series of investigations into the uses of various ethers and alcohols in medicine and surgery; and he was this year able to point out new remedies, the fruit of his labours, that have won, and promise to hold, a high place among the agents employed for the relief of pain and the cure of disease. He finds that it is becoming possible to predict the action of new compounds with great exactness from their chemical composition, and also by modifying composition to remove sources of inconvenience or of danger. By this line of work he hopes to arrive ultimately at an agent that will supersede chloroform and its analogues, and that will suspend sensation without danger to life. As a step in this direction, he announced the discovery of "tri-ethylic ether," a new substance, which had already been used as an anæsthetic, and from which excellent results might be expected. Dr. Richardson's report was very well received by a large audience, and called forth expressions of warm commendation of his labours from several speakers.

On Friday, in Section B, the following papers were read:—

Artificial Alizarine. By W. H. Perkin, F.R.S.

The Lancashire Alkali Trade. By W. Gossage, F.C.S.

The Hydrogenation and Hydriodate of Cyanogen. By Mr. T. Fairley.

The Distillation of Sulphuric Acid. By Mr. T. Fairley.

The Time needed for the Completion of Chemical Change. By Dr. Hurter.

Reciprocal Decomposition, viewed with reference to Time. By J. H. Gladstone, F.R.S.

A Method for the Determination of Sulphur in Coal Gas. By A. Vernon Harcourt, F.R.S.

The Estimation of Sulphur in Coal Gas. By W. Marriott, F.R.S.

Note on Thermal Equivalents. By J. Dewar, F.R.S.E.

In the evening Professor Tyndall delivered his lecture on the Scientific Uses of the Imagination to a crowded audience at the Philharmonic Hall. Professor Huxley, the President of the Association, occupied the chair.

On Monday, the Report of the Committee on the Treatment and Utilization of Sewage was read by Mr. Grantham, C.E.

A Supplementary Report on the Analysis of Sewer Gases, by Professor Caulfield.

The Phosphate Process applied to the treatment of Sewage. By Professor Forbes.

At the meeting of the General Committee, after the various invitations had been read, Professor Balfour moved, and Sir Walter Elliott seconded, that Edinburgh should be visited in 1871. The proposal was supported by Sir Roderick Murchison and Mr. Cowan, late M.P. for Edinburgh, and carried unanimously. Lord Houghton then moved, and Mr. Gassiott seconded, that the meeting should be held at Brighton in 1872; this also was carried. Upon the proposition of Professor Stokes, seconded by Mr. Spottiswoode, Sir William Thomson was chosen to succeed Professor Huxley in the office of President.

ANDERSON'S UNIVERSITY.

ELECTION OF PROFESSOR OF CHEMISTRY.

A *pro re natâ* meeting of the members of Anderson's University was held on 23rd ultimo, for the purpose of electing a professor to the chair of Scientific Chemistry, vacant by the death of Dr. Frederick Penny; Mr. Young, the President, in the chair.

The Secretary stated that applications for the vacant office had been received from the following gentlemen:—Dr. J. E. Thorpe, Owens College, Manchester; J. C. Brown, B.Sc. Lond., F.C.S., School of Medicine, Royal Infirmary, Liverpool; Thomas Ward, Ph.D., F.C.S., London; R. C. Moffat, Ph.D., Glasgow; Robert R. Tattock, F.R.S.C., F.C.S., Glasgow; and Dr. John Clark, F.C.S., Glasgow.

The Rev. Dr. Forbes said he was fully persuaded that the trustees were deeply sensible of the important bearing which this election of a successor to Dr. Penny must exercise upon the Andersonian University, and that they were conscientiously desirous that their choice might be such that the gentleman elected should not only sustain, but, if possible, advance the celebrity of the chemical chair, extend the knowledge of chemistry in this great commercial city, and enlarge the ever-increasing domain of discovery by important contributions, which might redound not only to his own celebrity, but to the honour of the institution. He then concluded by proposing that Dr. John Clark be appointed to the vacant chair. Dr. Ritchie seconded the nomination.

Mr. A. Harvie, after a few remarks in favour of Dr. Thorpe, read a note to the trustees from W. H. Perkin, of London, on the qualifications of Dr. Thorpe, and concluded by proposing his election. Mr. James Napier seconded the nomination.

Mr. J. H. M'Clure proposed Mr. Tattock.

The meeting proceeded to vote by ballot, Mr. G. Anderson, M.P., and Mr. W. Kedder being appointed scrutineers. The voting papers having been carefully gone over by the scrutineers, Mr. Anderson intimated as follows:—Dr. Thorpe, 28; Dr. Clark, 23; Dr. Brown, 4; Mr. Tattock, 2. Dr. Thorpe was declared duly elected.

Obituary.

At Hull, on the 16th inst., aged 33, Mr. Thomas Toogood, jun.,—of the firm of Messrs. T. Toogood and Sons, Chemists, and son of Alderman Toogood,—much respected.

The following journals have been received:—The 'British Medical Journal,' Sept. 17; the 'Medical Times and Gazette,' Sept. 17; the 'Lancet,' Sept. 17; the 'Medical Press,' Sept. 21; 'Nature,' Sept. 15; the 'Chemical News,' Sept. 16; 'Journal of the Society of Arts,' Sept. 16; 'Gardeners' Chronicle,' Sept. 17; the 'Grocer,' Sept. 17; the 'English Mechanic,' Sept. 16; 'American Journal of Pharmacy' for September; 'Chemist and Druggist,' Sept. 15; 'Chemists and Druggists' Advocate,' Sept. 20; 'Produce Markets Review,' Sept. 17; 'Philadelphia Medical and Surgical Reporter,' Nos. 691 to 702.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

PHARMACEUTICAL TITLES.

Sir,—I had hoped that the opinions expressed by your correspondent on the 20th ult. on the subject of pharmaceutical titles would have been supported by an abler pen than mine; but, rather than the matter should be allowed to drop, I would fain ask for a small space in your Journal to say how fully I endorse his sentiments.

It seems to me, Sir, that this distinction of titles is the one great desideratum to the younger members of our profession. While all right-minded men would be disposed to grant a certain licence to the older members of the Society, those who have borne the burden and heat of the day, and have laboured hard to bring the Pharmaceutical Society to the prominent place it now holds among the scientific bodies of the country, I think they would also be equally disposed to insist upon the younger ones standing on their own merits. No wonder the public is bewildered by the multiplicity of titles now adopted to impose upon their credulity,—titles, we must admit, perfectly just in themselves, but which fail to distinguish the mere chemist and druggist from the man who has qualified himself by passing an examination of so high a standard as that of the "Major" of our Society.

Nor can we wonder at men stopping short at the "Minor," when the only recompense in the way of title they get for their time and toil devoted in qualifying themselves for the Major is the vague and now almost meaningless name of "Pharmaceutical Chemist."

This subject cannot be too strongly urged upon our Executive Council, and I hope they will not be slow to appreciate its importance, and act upon it accordingly; and I would suggest that other members who feel interested in the matter should ventilate it in these columns.

I am, Sir, your obedient servant,
ANOTHER ASPIRANT TO THE MAJOR.

"FREE TRADE IN SURGICAL INSTRUMENTS."

Dear Sir,—Seeing a letter from Messrs. Maw, Son and Thompson in your Journal of 10th inst. defending their policy, and explaining their reasons for sending their catalogues to surgeons, I shall feel obliged if you will give these observations of mine a place in your columns in reference thereto. A year or two ago Messrs. Maw asked us to forward to each of our surgeon-customers one of their catalogues, and, at the same time, to inform them that we could supply Messrs. Maw's goods at catalogue prices (off which they allowed us 25 per cent.). Some months after this they issued a fresh catalogue (net at six months or 5 per cent. cash), but, strange to say, many of the articles at net prices were the same as those formerly subject to 25 per cent. The effect of this was to compel us to break faith with our customers, or else to sell Messrs. Maw's goods at no profit; the latter course I preferred to adopt. Messrs. Maw explained this in saying that by taking 25 per cent. off they were selling at a loss; and yet these were their own terms, and should have been discovered before the first catalogue was issued. I think we are fully justified in condemning Messrs. Maw's conduct towards us. They made use of us to distribute their catalogues, and they now supply surgeons (who keep no stock, only buy an article just as they want it, and who make extraordinary prices of the same) upon precisely the same terms as ourselves.

There is one other feature in Messrs. Maw's conduct towards us which presses still more heavily upon retail chemists. Upon this Messrs. Maw do not touch.

I should very much like their explanation and defence upon what appears to me a most extraordinary and unparalleled course of conduct for a wholesale house to adopt towards its customers. I refer to their sending their catalogue to the chairman or clerks of the various Poor Law Boards throughout the kingdom.

Is it common justice to the trade that every Poor Law Guardian throughout the kingdom (and, of course, their friends) should be made acquainted with the cost price of druggists' sundries,—elastic stockings, bandages, waterproof sheeting, trusses, air- and hotwater-cushions, ladies' belts, enemas, breast-bottles, conversation tubes, electro-magnetic machines, inhalers, spray producers, suspenders, riding-belts, bottles of all kinds, lint, sponges, piline, medicine chests, elastic syringes, spread-plasters, etc.?

I have heard of Messrs. Maw's catalogue being used in some instances by the union clerks as a drawing-room book. The policy Messrs. Maw are adopting towards the trade is to me even a greater evil than the co-operative store system, of which doubtless, whether in London or in country, we all feel more or less.

I asked Messrs. Maw's representative when he called on me last if he had waited upon the chairman of the Yeovil Board of Guardians for an order, for I scarcely thought it consistent for him to call upon me after having sought to do business directly with my customers. T. C. MAGGS.

BRIGHTON CHEMISTS' ASSOCIATION.

Sir,—In the list of delegates from the various provincial societies to the Pharmaceutical Conference I see the name of Mr. Savage mentioned as representing the Chemists' Association of Brighton. May I be allowed, through the medium of your columns, to inquire in what part of Brighton the Association is located, and who are its officers? I have been a resident in the town for a period of two years, and during that time have made several inquiries respecting the said Association, but have never received any definite reply that it at present exists. That such an Association did exist at some remote period there is not a doubt, and a recent correspondent in the Journal has informed us that there is still a nucleus for the reconstructing of one; if such be the case, why do not the pharmacists of so large and popular a place as Brighton awake out of their present dormant state, and, by incorporating the whole body of principals and assistants located here, establish an Association worthy the reputation of the town, so that at future Conferences the veteran worker in the cause of pharmacy—Mr. Savage—may be the representative of a reality, and not of a Society that has ceased to exist? VERITAS.

Brighton.

HOSPITAL DISPENSING.

Dear Sir,—I who have been for sixteen years a hospital dispenser, see nothing extraordinary in a hospital physician or surgeon writing (scrawling, if that term better suits Mr. Fitch) as well as he can upon a patient's *greasy* card or paper, ℥j mist. cinch. rosæ c. acid. I used to consider it very thoughtful on the part of the doctors when they did "write it short." The prescriber knows very well that it is only intended for their own dispenser, and that he will understand it. Most hospitals have private formulæ, and for very good reasons. Mr. Fitch is evidently not well up in hospital work. As a rule, hospital prescriptions are dispensed as well and with as good articles as those used in private establishments.

To try to "run down" the medical profession, is not the way to elevate ourselves.

Let us not copy the *Lancet.*

EDWARD BARBER, *Another M.P.S.G.B.*

P.S. "Mist. D.D.D. t.d." and "Mist. M.A.C. t.d." would puzzle Mr. Fitch, but hospital dispensers here understand it.

Sir,—If Mr. Simon reflects and looks a little farther, he will find larger dispensing establishments requiring his nursing other than the pharmacists. Early this month a respectable married woman obtained advice at Bartholomew's Hospital; a prescription was handed her for the dispensary; there the first words were, "Your bottles!" The woman answered, "I have none." "Then go and buy some." This she did (two wine bottles); the one was filled with a "gargle," the other a "mixture," both being handed to her, together with *two* corks and two labels, with the sweet sound from some one within, "Take them away." This, I fear, is an average type of hospital dispensing,—in other words, a waste of public money. If the corks fitted, why not have kept them there? if not, it was an insult to have given them; and, again, was this poor woman to be made the judge as to which was to be taken, and which was "*not*"? To discern between them was accomplished by some difficulty by

London, 13th September, 1870. A PHARMACIST.

The Pharmacy Act in its Relation to the Sale of Poisons by Grocers, etc.

Sir,—The Members of the Pharmaceutical Society, and all connected with pharmacy, will be grieved to hear what I have to relate respecting a sight which I saw in a large town in the north of Scotland about a fortnight since. On sauntering along its principal street I happened to look into a grocer's window, and, to my astonishment, I saw a bottle (about 2 lbs.) more than three-fourths full of a bluish powder, and distinctly labelled arsenicum alb. The bottle was in the midst of three or four dozen of apples, the other part of the window being filled with packets of Brown and Polson's Corn Flour. On making inquiries as to the use to which it was put, I was told it was good for killing rats, and very much used for that purpose. There were no precautions taken; the cork was not even tied over with leather, and there it was lying on its side in the most careless manner possible. Surely such a piece of right-down carelessness and ignorance should not be allowed to pass unnoticed. Where are the limits of the Pharmacy Act? I know nothing about the qualifications of the man selling such a poisonous substance as arsenic any further than that he pretends to be neither more nor less than a grocer and meal dealer. I hope that such a case will not pass without some notice being taken of it by the Pharmaceutical Society, and if you think of making any inquiry I shall gladly provide you with particulars. Apologizing for trespassing so largely, and hoping that this may not be considered an unwarrantable encroachment upon your valuable space,

I remain, dear Sir,

Prevention better than Cure.

State Aid for Pharmaceutical Education.

Sir,—Your remarks on this subject seem to imply that we are indebted to Mr. G. F. Schacht for procuring us the privileges of the Science and Art Department Examinations. I beg to say that those privileges have always been accessible to us, and that teachers have always received payment on the result of our passing. As a proof of this, I may mention that nine chemists' assistants passed at the last May Examinations at Birmingham in inorganic chemistry and botany, four of whom obtained Queen's prizes.

I am, Sir, yours, etc.,

An Assistant.

Concentrated Medicine.

Sir,—While reading the correspondence part of your Journal of the 10th instant, my attention was drawn to a copy of a prescription, headed, "Concentrated Medicine," the correspondent of which wishes to know the proper mode of dispensing it. Although these few lines are from one of less experience than others, still I give my opinion as to the manner of dispensing it. No doubt that the dispenser at first sight is puzzled, knowing that a mistake has been made by the prescriber, on account of the strength and proportions of the ingredients in the mixture being in so concentrated a form, and the absence of directions for administration. The following is a copy of the same as I should have dispensed it, with the addition of the aqua, which when mixed with the inf. calumbæ conc. forms the ordinary strength of the same in the Pharmacopœia, viz.:—

℞. Ferri Pot. Tart. ʒiij
Ammon. Carb. ʒiss
Tinct. Aurantii,
Inf. Calumbæ Conc., aa ℥iss
Aquæ Destillat., ad ℥xij.

Misce et signa, Sumenda Coch. Med. bis aut ter in die.

The above dose is one which I deem perfectly safe for the patient, who appears, according to the ingredients of the prescription, to have been an adult.

I am, Sir, yours obediently,

Atherstone, September 12th, 1870. George Sant.

Sir,—Having had considerable experience in dispensing, I tender my method of dispensing the prescription ("Concentrated Medicine") in the Journal of the 11th instant.

Well rub down the iron and ammonia in a mortar, add the infusion by degrees, lastly the tincture.

Respecting Mr. Coles's prescription in the Journal of the 3rd, in the absence of any information from the patient, I should put up the mixture as prescription, and the pills divided into 24; ij p. r. n.

Perhaps some of your correspondents would inform me what they would have done in a case of this sort:—

A gentleman presented a prescription a few days since, handing over with it a 16-ounce bottle, saying he wanted half the quantity made up, which just filled the bottle.

℞. Sulph. Sublimat. purif. ʒiv
Potass. Bitart. ʒiss
Magnes. Sulph. ʒij
Ac. Nit. Mur. dil. ʒiss
Inf. Quassiæ ℥xxiiiss

M. A wineglass or less or more on rising, "shaking the bottle well."

According to the label on the bottle it had been dispensed at one of the first firms in town, but no sign of a shake-the-bottle label thereon. Is it possible that a London firm would have sent out medicine in that style? If nothing more, it gives the public an idea that a country chemist who dispenses it accurately is not up to his business.

Eastern Medical Hall, Yours, etc.,
Brighton, September 15th, 1870. W. C. Hales.

Improvement in Stoppered Bottles.

Sir,—Allow me to suggest to bottle manufacturers the utility of making a little groove for string at the tops of stoppers. Capping with paper is wholly insecure, and with leather not much less so. For some time past I have in dispensing tied stoppered-bottles with string, I need scarcely say with what inconvenience, for want of a little groove in the stoppers. I am, Sir, your obedient servant,

Glastonbury, September 12th, 1870. T. Mayhew.

Extra Charges after Business Hours.

Sir,—Through the medium of your next issue, I should much like to ask the question of "extra charge for medicines after or before business hours."

Many people are in the habit of calling up the chemist at all unreasonable times, knowing that "medicines can be had at any hour by ringing the bell," for things which I am sure could, in many cases, be left until a more suitable time, and, if we were to charge some 25 per cent. extra, would be.

The opinion of yourself or subscribers will oblige.

Yours obediently,

J. H. Jessop.

15, *Princes Street, Hanover Square, Sept. 7th,* 1870.

Material for Stanching Blood from Wounds.

Sir,—In the American civil war equal parts of flour and salt, thoroughly mixed, were found very efficacious in stanching the blood from wounds. Would it not be as well at this juncture to revive the fact, and give it as much publicity as possible?

I had an opportunity of testing its efficacy in two instances, one in a cut artery, and the other where a man's posteriors were frightfully eaten away by disease. He found he could sit with less pain by using the powder.

I am, Sir, your obedient servant,

September 12th, 1870. Pax.

A. P. S. desires to be informed, through the medium of the Journal, as to the best mode of dispensing the enclosed prescription, and whether it is intended to give sulphate of soda or lime in the mixture.

℞. Conf. Aromat. ʒij
Sodæ Bicarb. ʒj
Acid. Sulph. dil. ʒss
Aq. Menth. ad ℥viij

Capt. ℥j ter in die. J. G. D.

W. R. L. (Islington).—Ammoniated mercury (white precipitate) is included in the second part of the schedule of poisons.

J. E. George (Aberdare) wishes for a recipe for administering Santonin in a liquid form.

W. B. P. asks what are the best means "for preserving animal substances for some length of time in a pure condition, without poison, fit for culinary purposes."

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

THE PROCESS OF NUTRITION.

BY BARON LIEBIG.

The achievements of that art which relates to the preparation of food are really surprising in regard to the economy of power and the increased efficacy of food materials within a given time. Under the influence of heat, as already mentioned, the digestibility of the chief constituents of food is rather augmented than diminished. The operations of roasting and boiling, the long-continued simmering practised in the preparation of various kinds of flesh, either of mammalia, fish, or birds, the selection of vegetables and sauces to accompany particular dishes, are all means calculated for effecting the disintegration of the food or complementing and increasing its action, as well as for shortening the time required for the work of digestion. With the child we find a difference even with sugar and milk-sugar, while both are preferable to starch.

Experienced cooks attach the greatest value to the soluble constituents of the muscles of mammalia as an adjunct to their viands. To obtain this working material of muscle, they prepare from the waste fragments of the kitchen an extract, the importance of which is characterized by its name, "stock," which is understood to denote its applicability as a basis or for enriching other preparations of food.

It is wholly unintelligible that the dietetic value of the extractive material of flesh should not have been recognized long ago and regarded as perfectly well established; it is equally unintelligible that doubts should still exist in regard to it even among physicians, while the efficacy of this material in the form of broth for promoting the strength of convalescents has been well known, not only for years, but since the time of Hippocrates.

It is clear that this material, taken in the form of soup or sauces, or as an adjunct to vegetable food, must have the same effects on the animal body as when it is taken as a part of meat.

In regard to the selection of food corresponding to the wants of man, instinct is an infallible guide, when aided by that watchman of health, the sense of taste; it may be misled for a time, but not permanently. At the entrances of the Munich beer-cellars we find a law of nature expressed by the proximity of the never-failing cheese-booth. The beer-drinker consumes his respiratory material in the form of beer, while in the form of cheese he obtains the material indispensable for production of blood and for generating force. Since beer serves as respiratory material more readily than fat would do, he dislikes fat and declares it to be unwholesome. With the beer he eats his cheese without butter.

The extractive substances of flesh when added to food do duty as true nutritive materials in the place of those substances which are otherwise produced from albumen. The most simple observation will suffice to dispel any doubt of this.

The experiments of Bischoff and Voit have established the fact that gelatin has a considerable nutritive value when combined with meat—about one-fourth that of albumen,—so that while a dog weighing 36 kilograms lost in about four days one pound in body-weight when fed with 500 grams of meat alone, he gained in three days about 134 grams when the same quantity of meat was given together with 200 grams of gelatin.

According to our knowledge of the nature of gelatin and its composition, this power of nutrition cannot be accounted for on the assumption that the gelatin, or any part of it, is converted into albumen, so as in this way to add to the quantity of albumen consumed; but we must infer that it has this power, because it replaces certain substances necessary for the animal organism, which are produced more readily from gelatin than from albumen; so that, in consequence of this, the animal is relieved from work, to some extent, while a certain quantity of albumen remains available for other purposes.

A dog may be fed with boiled porridge made of the entire grain when bone-meal is added to it, and the animal will thrive almost as well as if fed upon meat.

I believe that the imperfect appreciation of laws of nutrition and dietetics is to be ascribed to two erroneous ideas; one is that, in experiments on nutrition, *a particular* animal has been regarded as the representative of all animals, and it has been deemed proper to draw general conclusions as to the process of nutrition from experiments made with that particular animal alone. From observations on carnivorous animals inferences have been drawn as to the phenomena in herbivorous animals; and from the action of vegetable food in the body of a carnivorous animal attempts have been made to draw conclusions as to the nutritive value of meat.

The dissimilar expenditure of power in individuals of different classes of animals, or the generation of power for the performance of interior and exterior work, is but little regarded by some physiologists; with many, indeed, the animal body is nothing more than a machine that converts albumen into urea.

A second equally great error consists in ascribing to albumen, as some physiologists do, an action which it does not at all possess, according to its nature.

Albumen is, for the animal body, nothing more than what carbonic acid, water and ammonia are for plants; and in this its value is sufficiently high. Besides the importance that water has for the plant, inasmuch as it yields hydrogen to it, there is another chemical value it has for the plant, in being the means by which carbonic acid is taken up, and by which mineral food is supplied. In like manner, carbonic acid, which yields carbon, has the particular virtue of rendering soluble several substances which are insoluble in water. Albumen, also, possesses similar characters, but it does not exercise any special action; and it is a misconception of the nature of albumen to suppose that physiological phenomena are to be explained by means of the idea we have of albumen. It is only by means of the things produced from albumen that this substance acts, and therefore it is impossible for me to concur in the modern notions of organized albumen and circulating albumen, which are, nevertheless, one and the same thing. These notions introduce confusion to such a degree that one does not know how to distinguish left from right.

All combustible plastic constituents of the animal body are, in fact, altered atoms of albumen, just in the same way that the constituents of the plant are altered atoms of carbonic acid; and it is quite certain that most of the products originating from albumen in the animal organism are capable, when taken as food, of replacing albumen in the processes of nutrition and force production, as well as in special processes, as is the case with sugar and fat, or their derivatives, such as alcohol, etc., in the process of heat production. The limited conceptions of food materials, which rest upon observations of the processes taking place in the organisms of herbivorous and carnivorous animals, must be considerably extended in the case of man.

Since the term digestion cannot be understood in a chemical sense, otherwise than as the process by which the colloids of the food—comprising albumen, casein, gelatin, starch and gum, etc.—are transformed into a diffusible condition, it may be understood that the constituents of muscular juices, when taken in the food, require, for the most part, no digestion; and that they are, when taken in meat diet or alone, first of all brought into the circulation, exercising the action peculiar to them, long before the albumen has been rendered soluble in the stomach. They are among the normal constituents of flesh, and must be regarded as highly efficient nutritive material; not, however, in the sense in which albumen is nutritive, but in a much higher sense. It is impossible for these substances to replace albumen in its functions; but they have an activity independent of albumen, they are nutritive materials which economize work and augment power in certain directions.

In like manner, gelatin must be comprised among the nutritive substances that economize albumen.

Studied from this point of view we shall, it is to be hoped, have to anticipate an entirely different view of the action of various articles of diet, and even the action of some medicines may become explicable by such an expansion of the idea of nutrition.

I regard it as quite indubitable that vegetable diet may, by addition of the extractive substance of flesh, acquire an action upon the human body just the same as a meat diet exerts; of course, under the assumption that there is in the vegetable food a sufficient quantity of digestible albuminates. Certainly, the extract of meat is the only available means of making up for a dearth of animal food. In regard to matters of this kind controversy is inadmissible, and the dietetic value of the material must be tried upon men, and not upon dogs.*

It is right to investigate details in order to comprehend the whole in its origin and action, but in order to interpret details correctly, it is necessary to have a clear conception of the whole in its many-sided aspects and surroundings.

I know pretty well how to estimate the significance of experiments or facts, and how unlike they are in value for drawing conclusions. The simple observation of a natural phenomenon which takes place without our aid is very much more important, though frequently much more difficult, than the processes set going in experiments at our will. In the former, reality is always reflected, while experiments reflect only the imperfection of our ideas.

I remember years ago in walking along the road from Berchtesgaden, on the König lake, to have arrived at a conviction as to the source of carbon in plants by means of a very simple observation. At that time great uncertainty prevailed in regard to this matter, and it was difficult to get beyond the belief in humus being the source of the carbon in plants. But at the place I have mentioned there is evidence that the carbon of plants can only be derived from carbonic acid, and the proof of this is furnished by nature herself. There masses of rock which have fallen down from the surrounding mountains may be seen with trees thirty or forty feet high growing upon

* Experiments undertaken at my suggestion by Dr. E. Bischoff, in which extract of meat was added to bread in order to increase its nutritive power and facility of assimilation in the case of a dog, have not been successful, as might have been foreseen by a more judicious consideration of facts previously known. Their failure was due to the nature of the carnivorous animals. The animal could not eat a sufficient quantity of vegetable food to meet the requirements of maintaining the body-weight, neither could the starch consumed be digested completely.

In one experiment made by Bischoff and Voit, it appeared that a dog, weighing 34 kilograms, fed for forty days with as much bread as he could eat, did not consume more than 771 grams of bread daily, while he digested only seven-eighths of this quantity, the remainder passing away in the fæces, which contained a recognizable quantity of starch.

In the 676 grams of bread assimilated, there were contained:—

Bread albuminate,	Starch,
$55\frac{1}{3}$ grams.	299 grams.

Calculating the starch into its equivalent of fat (24 starch = 10 fat), and assuming the addition of meat-extract to have, as it were, converted the bread-albuminate into flesh, the dog would have consumed:—

In the form of flesh,	Of fat,
257 grams.	125 grams.

But this ration would be insufficient for a dog weighing 34 kilograms in order to maintain his body-weight. The dog remained in a state of hunger. The maintenance of his body-weight could have been expected only when the assimilated starch had been mixed with four times as much vegetable albumen, in the form for instance of gluten, or when it had been possible for the dog to digest twice as much starch in addition to the bread-albuminate consumed; but he could not fully digest even the quantity consumed.

Assuming that the dog fed with bread gives off as much nitrogen as intestinal secretion in the fæces as the dog fed with meat, and calculating from this quantity of nitrogen, it would appear that the dog digested the bread-albuminate to within $6\frac{1}{2}$ per cent.

Comparing the ration of pure vegetable diet, which wlll maintain a man in a state of perfect ability to work, with that which a dog can digest, the difference in their capacity of digestion at once becomes apparent. A wood-cutter receives from his employers when he goes after breakfast on a Monday into the forest, 3·4 pounds of dripping, 7·8 pounds of meal and 4·5 pounds of bread. He comes home on Saturday evening to supper. This quantity of food is, therefore, sufficient for five days, it represents—when the starch is calculated as fat and the bread as meat, 100 meal = 140 bread, in which there is 8 per cent. albuminate—a daily quantity of:—

Flesh,	Fat,
540 grams.	626 grams.

Taking the weight of the wood-cutter as double that of the dog or 68 kilograms, he would receive in his meal and fat diet nearly the same quantity of meat as the dog, but $2\frac{1}{4}$ times as much respiratory material. It is this that is deficient in the case of the dog, and this is what must be supplied from its body. The wood-cutter provides himself also with a portion of baked fruit, certainly not merely for the sake of his palate, for he thus increases the quantity of alkalies in his food. These wood-cutters work steadily, but not rapidly; they are powerful and have a good muscular development.

Experiments with dogs are evidently destitute of any practical value for judging as to the nutritive power of vegetable food, and it is in no degree more possible to test the value of meat-extract for improving vegetable diet by experiments on carnivorous animals, for in their case we have no measure of the capacity for work. The addition of meat-extract to the meal diet of the wood-cutter would have exercised an entirely different influence in regard to his power of working.

The statistics of consumption of food among the Bavarian wood-cutters, which I have received from trustworthy sources, disprove the very general opinion that these people are capable of hard work with a diet consisting chiefly of sugar and bacon. Opinions of this kind are, from a scientific point of view, not worth consideration.

them, with the roots extending into fine cracks in the rock, and covered only with moss and a thin layer of earth consisting of accumulated dust. In this case a supply of carbon by humus was quite out of the question.

There is no deficiency of similar facts which afford indications of the laws of nutrition, all that is required is the inclination to see them.

It appears to me almost inconceivable that the high value which a French family sets upon the *pot au feu* should be merely due to fancy or prejudice, nor can I believe that one of the most distinguished men in the medical department of the army should venture to say, "Soup makes the soldier,"* if he was not fully convinced as to the high efficacy of meat broth mixed with the necessary vegetables, while we know this is a form of food which the French soldier frequently prefers even to meat.

Is it possible to believe that the enthusiastic praise bestowed upon the extract of meat as a means of strengthening wounded soldiers by two of the most celebrated members of the French Academy, thirty-six years ago, before extract of meat was an article of commerce, could have rested only on imagination, or that the opinion expressed by these two men was not based upon extensive experience ?†

Daily experience teaches us that a decoction of peas, fat and salt is inferior in nutritive power to pea-soup made with strong meat broth. Their effects are also different in every way, and the difference is decidedly in favour of the soup prepared with meat. Nevertheless, it is only to the extractive constituents of the meat, and not the albuminous portion of it, that this difference is due.

Since my investigation of the chemistry of flesh in 1847, I have incessantly endeavoured to make the surplus meat-supplies of South America and the Colonies available in the form of extract for the population of Europe; and it is a most remarkable circumstance that now, when my endeavours are at length being realized, a question is raised by some medical men as to the efficacy of meat-broth, and, for the first time, this is being disputed, as if the idea were a novel one that had not previously been heard of. However, there are always individuals who cannot pardon the success of others, who consider it quite proper that those who benefit mankind with useful inventions should be persecuted, and that the fruits of their labour should be disparaged.

This is an old experience. "My case," says Göthe, "should verify the old proverb, that if one has rendered the world a service he will have learnt to take care he does not do so again."‡

Medical men have never troubled themselves about the meat-lozenges (tablettes de bouillon), which have been an article of commerce for half a century, and though represented to be extract of meat, are really nothing but gelatine.

It appears to me that progress in the doctrine of nutrition, in pathology and in therapeutics is, in the first place, dependent upon the application of the fundamental laws of mechanics, which obtain in the animal organism and throughout nature in reference to motion and work.

* Dr. Baudens, "Une Mission Médicale dans la Crimée," *Rev. des Deux Mondes*, vii. 1857.

† Parmentier was General Inspector of Health during the Revolutionary War; Proust was through the whole Spanish war.

‡ Eckermann, "Conversations with Göthe."

The greatest hindrance to the appreciation of, and insight into the actions of the animal machine, is the constant confusion of the physiological sense of power with actual power.

One of the most distinguished medical investigators considers "that the food consumed strengthens much sooner than the actual digestion takes place, and that by the absorption of a very small quantity of material into the blood a stimulus is produced sufficient to overcome or reduce the state of fatigue; in this way may be explained the fact that a drink of fresh water, a glass of wine, beer, or spirits, appears for a time as powerful a means of restoration, or even more so, than a beef steak."

It is true that even the smell of a roast joint makes one forget fatigue; but it seems going too far to make us believe that thirst and hunger are identical conditions. A draught of cold, fresh water is doubtless in the case of thirst a stronger restorative than roast beef, while in the case of hunger roast beef is a stronger restorative than a glass of water. Spirits or wine stimulate but do not strengthen; a whip would do the same. It may happen that a man has to work immediately after taking his meal, but he does not do so willingly; the rule is that a labourer should rest after his meal-time for an hour, and it is only after several hours that he becomes again capable of intense exertion.

(*To be continued.*)

NOTE ON THE CONSTITUTION OF ALBUMEN.

BY J. ALFRED WANKLYN.

M. Béchamp has recently repeated his statement that urea is obtainable from albumen by means of permanganate of potash, and has published details which seem to leave little doubt on the subject. The fact that urea is itself oxidizable by permanganate of potash will go a long way towards explaining the failures experienced by other chemists in their attempts to get it from albumen.

Some results obtained by Chapman, Smith and myself, in the course of investigations undertaken for the purpose of establishing the ammonia method of water-analysis, would seem to indicate that urea exists ready formed in albumen; or rather that albumen is, like creatine, a compound wherein urea and something else are joined together, with loss of the elements of water.

When albumen is mixed with aqueous solution of caustic potash and then dried-up in the oil bath, it yields one-third of its nitrogen in the form of ammonia, the remaining two-thirds being obtainable as ammonia on boiling the dried-up mass with a solution of permanganate of potash. But, if the preliminary evaporation to dryness with caustic potash be omitted, the action of strongly alkaline permanganate of potash converts only two-thirds of the total nitrogen of albumen into ammonia.

Now, a caustic alkali converts urea into carbonic acid and ammonia; but permanganate of potash oxidizes it, so as to yield no ammonia, the nitrogen in this case making its appearance either in the state of gas or as nitric acid.

So likewise in the case of creatine, one-third of its nitrogen is evolved as ammonia when permanganate of potash is employed, and in creatine one-third of the nitrogen is present in a form other than urea, while two-thirds of it exists as urea.

It would, therefore, appear that one-third of the nitrogen in albumen exists in the state of urea, while the remainder is in some other state of combination.

ON THE DISCRIMINATION OF FIBRES IN MIXED FABRICS.*

BY JOHN SPILLER, F.C.S.

In the course of an experimental inquiry undertaken for the purpose of identifying the fibres entering into the composition of mixed fabrics, the author was led to the discovery of the fact that silk alone, of all the materials ordinarily used in the production of textile fabrics, is soluble in concentrated hydrochloric acid. The chemical properties of the silk solution so prepared were described, and a photographic application pointed out by the author, who exhibited in this connection a matt paper print, which was stated to have been produced in a much shorter time than that commonly required for an ordinary print on a plain salted paper. A hydrochloric acid solution of silk was used, which, being made as concentrated as possible and neutralized by addition of ammonia, furnished a new organic chloride, particularly suitable for salting paper intended for solar camera enlargements. For the purpose of identifying wool in the presence of cotton, flax, jute, etc., it is recommended to immerse the fabric or loosened fibres in a warm aqueous solution of picric acid, which dyes the wool of a bright yellow without imparting any colour to cotton. Thus, by treating a mixed fabric successively with hydrochloric and picric acids, valuable indications are afforded regarding its constitution.

BEECH MORELS.

BY M. C. COOKE, M.A.

There are five or six species, forming a genus of fungi peculiar to the southern hemisphere, most, if not all, of which are available as food. These are the beech morels, or *Cyttaria*, first made known to science by the Rev. M. J. Berkeley.

All the species hitherto discovered have occurred on beech-trees, each one, with but a single exception, on a separate species of beech. Their geographical limit is confined within a narrow zone, enclosed between the parallels of lat. 30° and 60° S. Four of them are South American, two having been collected in Chili, one in Tierra del Fuego, and one at Cape Horn,—one species being indigenous to Tasmania.

DARWIN'S BEECH MOREL (*Cyttaria Darwinii*, B.) occurs on *Fagus betuloides*, in Tierra del Fuego. Small specimens, half an inch in diameter, are globose, but depressed above and below, so as to resemble a little button mushroom, strongly umbilicate below, with the edges of the umbilicus slightly puckered, and supported by a short brown stem, one and a half lines high and two lines thick, which proceeds from the umbilicus, and is granulated like shagreen, as if beset with a small black parasitic *Sphæria*. The epidermis is tough, very smooth, and shining. A vertical section presents a brown fibrous mass springing from the stem, which gives off on every side elongated radiating fibres, divided from each other by a dark line, but which do not easily separate from one another. The divisions of the internal mass towards the circumference are more minute, but well marked, and the epidermis quite distinct. In a more advanced stage of growth, when the balls are from one to two inches in diameter, the cups begin to appear, the interior presenting in other respects nearly the same appearance as before, except that the divisions are larger. They are formed beneath the cuticle, and are at first covered by a portion of the matrix. The cuticle becomes depressed, though still tough and thick. The hymenium is separable in a body from the surrounding substance, except at the top. The cells or cups themselves are ovate, lined almost to the top by the hymenium. The substance interposed between the top of the cells and the cuticle is gradually absorbed, and the cuticle itself becomes thinner and tightly stretched over the cavity, and at length bursts and forms a membranous border to the irregular orifice. The margin appears to be a little reflected. The hymenium consists of very slender paraphyses, and abundant large, slightly flexuous asci, which contain eight sporidia, mixed with a few globose granules. The asci at length become free, in which case they are generally slightly swollen at the base, and at last, in old specimens, there is scarcely any trace of them in the hymenium, which consists of paraphyses only. When the cups are quite formed, and perforated, the cellular arrangement of the contents of the balls has wholly vanished, and there are only a few faint radiating lines in place of the regular divisions. The whole substance is composed of branched, more or less flexuous threads. Occasionally the stem is not at all distinct, and the general form less globose, probably from the individuals having grown more deeply in the fissures of the bark. Mr. Darwin states further of them, "They are of the colour of the yolk of an egg, and vary in size from that of a bullet to that of a small apple; in shape they are globular, but a little produced towards the point of attachment. They grow both on the branches and stem, in groups; when young they contain much fluid, and are tasteless, but in their older and altered state they form a very essential article of food for the Fuegian. The boys collect them, and they are eaten uncooked with fish. Some of these balls remain on the trees nearly the whole year."

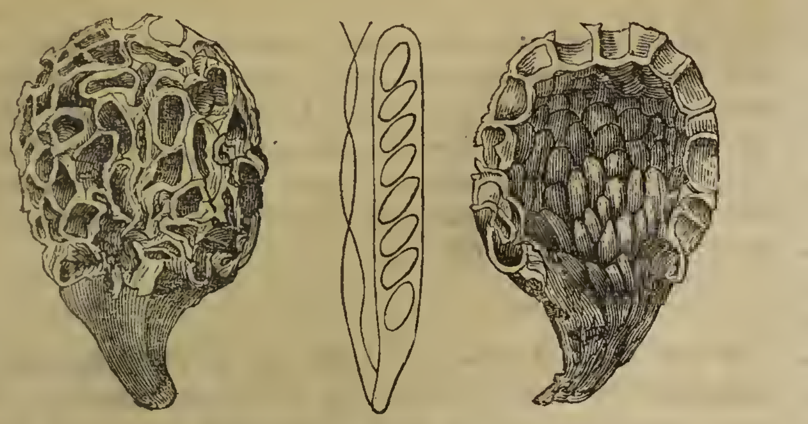
BERTERO'S BEECH MOREL, *Cyttaria Berteroi*, B.—Of a paler colour than the last, from an inch and a half to three inches in diameter, not regularly globose, but lengthened at the base. Cups large, three-tenths of an inch or more broad; aperture more or less decidedly pentagonal, bordered by the revolute margin, which is split into portions corresponding with the sides of the aperture. Asci more slender and longer than in Darwin's Beech Morel; sporidia elliptic, smaller, separated by a granular mass. The flesh in the full-grown plant is mottled, consisting of branched, flexuous filaments. There are a few black granules about the base. On *Fagus obliqua*, in Chili.

This species was first noticed by Bertero, and afterwards found by Mr. Charles Darwin, who says, "I found a yellow fungus very closely resembling the edible ones found on the beech at Tierra del Fuego. Speaking from memory, the difference consists in these being paler coloured, but the inside of the cups of a darker orange. The greatest difference is, however, in the more irregular shape; in place of being spherical, they are also much larger. Many are three times as large as the largest of my Fuegian specimens. The footstalk appears longer; this is necessary from the roughness of the bark of the tree on which they grow. They are occasionally eaten by the poor people."

TASMANIAN BEECH MOREL, *Cyttaria Gunnii*, B.—This is found on living branches of *Fagus Cunninghamii* and *Fagus Gunnii*, in Tasmania. It grows in tufts or clusters on swellings of the branches, at first pear-shaped, and without any distinct stem, becoming afterwards more decidedly globose and hollow. In size this species attains from one to two inches in diameter, closely studded with the cups, which are numerous, and have broad, irregular orifices. The asci are rather short and cylindrical, each containing eight broadly elliptical sporidia. The hymenium very speedily becomes obliterated.

* Read in Section B. of the British Association, on Friday September 16th.

This fungus abounds in the dense forests to the westward in Tasmania, and was freely eaten by the aborigines



Cyttaria Gunnii, Bert.

in their wild state. It has also a reputation amongst the settlers for its esculent qualities.

Hooker's Beech Morel, *Cyttaria Hookeri*, B.—Found on the living branches of *Fagus antarctica*, at Cape Horn. The common receptacle does not exceed an inch in height, with a diameter of from half to three-quarters of an inch, attenuated at the base, and obtusely papillæform at the apex, universally smooth. The cups are few in number, at first filled with a gummy matter, and at length empty. The asci are somewhat linear, intermixed with linear, sometimes forked, paraphyses. Whether this small and rather singular species is at all used as an article of food has not apparently been ascertained.

Chilian Beech Morel, *Cyttaria disciformis*, Lev.—The smallest species yet discovered, scarcely exceeding a quarter of an inch in diameter. It is flattened like a button, with a convex upper surface, on which are scattered a few point-like cells at some distance from each other. These cells have, at present, only been found to contain long filaments, with a layer of compressed cellules, terminating in globular swellings, each of which contains an opaque and irregular body. Of course this species, which is found in Chili, is too small to be of any value as an esculent.

Allusion having been made in a previous number of this Journal to esculent fungi, it has not been considered out of place to give a short account of these singular Beech Morels of the south. As food products, they do not seem to differ much from our own Morels, although botanically and generically distinct. Unfortunately, we have very little information regarding their edible qualities beyond the fact that they are employed as food. No medicinal virtues appear to have been assigned to them. It is a remarkable fact that the practice of eating some species of fungus seems to be almost universal in all countries where fleshy fungi are found, and in all to be confined to a very few species. Only very recently we have been enabled to identify the Morels which are eaten at Kashmir, and much still remains to be learnt of the esculent fungi of other parts of the world. Certainly some are esteemed in Persia and other parts of Asia, of which we know nothing. In the course of time we hope to record something of these; meanwhile, we wait and hope.

MUSTARD.

BY M. COMMAILLE.

White mustard possesses medicinal properties which are very difficult to be explained. Our knowledge of its chemical composition, like that of many other organic substances, leaves much to be desired. Let us glance first at the actual state of science concerning this substance.

White mustard, *Sinapis alba*, belongs to the important family of the *Cruciferæ*, which furnishes products for use in medicine, food and the arts. Like all its congeners, it contains sulphur among its constituent elements, which sulphur readily manifests its presence when putrefaction takes hold of a plant of this family.

It is admitted that one part at least of the sulphur present in the crucifers, and consequently in white mustard, is in a form which gives easily hydrosulphocyanic acid, represented by the chemical formula $HCyS_2$, or HC_2NS_2.

This acid is rich in sulphur, containing 54 per cent. of its weight, and is very poisonous in its free state. It was discovered by Kinck in 1804. The same acid is met with normally in human saliva.

In white mustard the hydrosulphocyanic acid is combined with a particular base, sinapine, which has not yet been obtained in the dry state. When attempts are made to do so, it splits up into an acid, sinapic acid, $C_{22}H_{12}O_{10}$, and a new base, sincaline, $C_{10}H_{14}NO_2$. But as the formula for sinapine is $C_{32}H_{24}NO_{10}$, it follows that in the separation it has taken up two equivalents of water. The sinapine, it will be observed, is not sulphurized, but is nitrogenized, as are nearly all the organic alkalies. It gives well-crystallized salts. The formula for sulphocyanate of sinapine is $HC_2NS_2 . C_{32}H_{24}NO_{10}$.

Black mustard, *Sinapis nigra*, is distinguished from white mustard by the absence of sinapine. The sulphocyanic acid is also found there united to another substance, allyle, which exists also in garlic. It is an alcoholic radical, of which a great number of combinations are known. The sulphocyanate of allyle is represented by $C_2NS_2 . \underbrace{C_6H_5}_{\text{allyle.}}$. It is much more rich in sulphur than the sulphocyanate of sinapine.

This difference explains how it is that white mustard in contact with water gives off, upon putrefaction, an odour, disagreeable no doubt, but very far from the horrible stench given off by black mustard under the same conditions.

But the sulphocyanate of sinapine does not pre-exist in the white mustard any more than the sulphocyanate of allyle in the black. They are both the result of a reaction between the natural principles of these seeds in contact with water by a fermentation that is developed very quickly. So likewise the odoriferous and sapid principle in black mustard, which is so well known, the volatile oil, is produced by the action of a certain substance named myrosine upon the myronic acid combined with the potash in the seed.

The myronate of potash ought, according to MM. Will and Kœrmer, to be considered as the essence of mustard, sugar and the acid sulphate of potash. Thus, we have—

$$\underbrace{NC_{20}H_{18}O_{20}S_4K}_{\text{Myronate of potash.}} = \underbrace{C_8H_5NS_2}_{\substack{\text{Essence of mus-}\\ \text{tard or sulpho-}\\ \text{cyanate of allyle}\\ =C_6H_5C_2NS_2.}} + \underbrace{C_{12}H_{12}O_{12}}_{\text{Sugar.}}$$

$$+ \underbrace{KO . SO_3HOSO_3}_{\substack{\text{Acid sulphate of}\\ \text{potash.}}}.$$

A fermentation, possible only in the presence of water, is absolutely necessary in order that black mustard may acquire its pungent properties.

Further research is necessary upon this subject, since, according to received opinions, fermentation is never produced except under the influence of organized living bodies. Now, myrosine, the presumed ferment of mustard, does not fulfil this condition. However that may be, myrosine is met with in white mustard, but myronic acid is not, hence the absolute impossibility of its furnishing essence of mustard. Myrosine in the presence of water and sinapisine gives a principle very different from the essence of black mustard. This principle is the sulphocyanate of sinapine before spoken of.

Sinapisine, discovered by MM. Henry and Garot, is sulphurized, crystallizable and soluble in alcohol. It is a crystalloid, like myronic acid; whilst myrosine, which does not crystallize, and is coagulated by alcohol, warmth or acids, like other substances that approximate to albumen, is a colloid.*

To finish this brief history of the chemistry of mustard it may be added that the white contains much mucilage, and that its ash contains 10 per cent. of sulphate of potash, arising from the destruction of the sinapisine.

If now we take advantage of the knowledge previously acquired, we shall be enabled perhaps to raise a corner of the veil which has hitherto hidden the mysterious therapeutic virtues of white mustard.

The purgative properties of this seed have been explained as a mechanical action of carrying through and expulsion,—a sweeping of the intestine. The purifying properties have been attributed to the presence of sulphur and to a specific action which, considering the integrity of the mustard in the fecal matter, is not very clear.

If we examine a mustard-seed by the eye or under a microscope, we see that it is nearly round, scarcely wrinkled at the surface, neither very large nor very small. Left in cold water, it soon becomes ropy and very mucilaginous, acquiring a perceptible, but not disagreeable, flavour. The action of warm water produces this result much more rapidly. The seeds then roll one upon another with the greatest facility.

It is to these peculiarities that it appears in part to owe its purgative property. Seeds of larger size, the surface of which could not be acted upon by the liquids of the stomach and intestines, might, without doubt, purge more or less, but would greatly fatigue the organs, which could not support a large quantity of them; besides, the total surface being much less, the mucilaginous principle would be dissolved in smaller quantity.

Very small seeds, like the poppy, for instance, would be often arrested in the long course that they have to run; soon the whole intestinal passage would be covered, and there would be no progression of the mass. Black mustard, independently of its very irritating properties, is too small.

The extreme readiness with which white mustard gives with water an abundant mucilage (for which reason that having a thin perisperm should be chosen) adds to the facility, already very great, of the movement of the seed due to its convenient size and round form. Until the contrary is proved, it would appear that it is to this union of properties that white mustard owes its value as a purgative.

The depurative properties of this seed do not appear so easy to explain, since it is rejected in the excreta apparently without having undergone any modification. But this appearance is deceptive. The penetration of a liquid into seeds which have not a thick perisperm is easy. By osmose a very rapid exchange takes place with uncontrollable force, between the liquid charged with the soluble substances of the seeds and the liquid that surrounds them. Moreover, we know by the law which governs dialysis, which has been so well explained by the late Mr. Graham, that membranes allow crystalloids to exude easily (sinapisine is a crystalloid) while they retain colloids (myrosine is a colloid). It is not impossible, then, that sinapisine should be rapidly carried off from the mustard-seeds, although they remain intact, to be absorbed by the liquids of the digestive canal, and transferred by assimilation into the entire organism. That the sinapisine should be carried off as such, or that it should be transformed beforehand into sulphocyanate of sinapine, would matter little, sulphur being found in both substances.

Sulphocyanate of sinapine is, without doubt, an energetic poisonous principle, but it is among such substances we find the most medicines. It is only necessary that the doses should be so suitably apportioned, that they may not accumulate in the stomach, and that the elimination or destruction should keep pace with the administration of a fresh quantity, without which there would soon be symptoms of poisoning.

The less energetic character of black mustard, and its apparent inertness when employed as a condiment, should not be quoted in opposition to these views; for there the sulphocyanic acid is not combined with a base but with an alcohol radical, forming the sulphocyanate of allyle, a very irritating substance; not a salt, but an ether,—that is to say, a substance absolutely different.—*Journal de Pharmacie et de Chimie.*

* See the researches of M. Bussy and MM. Boutron and Frémy upon myrosine, myronic acid and sinapisine.

Fire and Loss of Life at a Wholesale Chemist's.—A fire, involving a serious destruction of property and the loss of four lives took place on Tuesday afternoon last at No. 30, Liverpool Street, Bishopsgate Without. The premises in which the disaster took place were occupied by Mr. John Bush, wholesale chemist, and were of considerable extent, consisting of stores, packing-rooms and receiving offices. Whilst the hands were employed on the ground floor packing goods, some one in the warehouse gave the alarm that the place was on fire. At that time only a slight blue glimmering light could be seen at the end of the warehouse, and those present, instead of at once sending across the road to call the engines, tried with the aid of buckets of water to subdue the fire. The flames, however, soon reached the bottles of tinctures which were on the shelves, bursting and then seizing on the carboys of spirits. On the first floor two females and a lad were employed in cutting and preparing labels. These poor creatures were either blown into or took refuge in a cupboard, where they were found dead, shrivelled up and burned in a dreadful manner. Mr. James Woolley, the manager, was suffocated by the fumes of the ignited chemicals while making an effort to save the other people employed on the premises, as well as his wife, who was in the first floor. His wife, who was with difficulty rescued, was in such a state as to necessitate her immediate removal to the hospital. The fire was not extinguished until that part of the building where it had originated was considerably damaged.—*Times.*

Adulteration of Saffron with Chalk.—M. Constantin, of Brest, has pointed out this adulteration in the August number of *L'Union Pharmaceutique.* The sample he examined was obtained from a drug house of good repute, but it contained as much as 15 per cent. of chalk. The observations of Mr. Hanbury and Professor Maisch, to the same effect, would appear to indicate that this adulteration is extensively practised.

University of Edinburgh.—It is announced that Professor Allman is about to resign the chair of Natural History in the University of Edinburgh, which he has held since 1855, on account of ill-health. It is also said that Sir Roderick Murchison has resolved to give £6000 towards the endowment of a chair of Geology and Mineralogy in the University, if the Government show equal liberality in the matter.

Puff-Balls for the Wounded.—It has been suggested that dry puff-balls, which are frequently used in some country districts for stanching blood, might be employed with advantage in the place of lint for dressing the wounds of the sufferers in the war. They possess the property of adhering closely to the wound, which is rather a merit, perhaps, when it cannot be frequently dressed, and at present they might be obtained in great abundance.

Hydrochlorate of Quinine in Whooping Cough.—Dr. Breidenbach calls attention to the benefit that may be derived from this remedy when other means have failed. It requires to be administered in comparatively large doses. To a child of three weeks Dr. Breidenbach gave a grain and a half per diem; and to one of eight years as much as fifteen grains per diem.—*Lancet.*

The Pharmaceutical Journal.

SATURDAY, OCTOBER 1, 1870.

PHARMACY AND MEDICAL PRACTITIONERS.

Where could our good friend the Editor of the *Lancet* have been when the article on "Pharmacy and Medical Practitioners" found its way into his columns on the 17th ult.? Off to the wars or, it may be, to the British Association for the Advancement of Science. Clearly a spirit quite new to our contemporary guided the pen of the writer when, after descanting on the enormity of a chemist receiving as much as "2*s.* 6*d.* or 3*s.*" for dispensing a physician's prescription, he discovered that at such a rate the patient's "drug bill is equal to, or even exceeds, the doctor's bill."

On reading the first half of the article in question, we certainly felt its statements to be, in the main, correct, and that the duties of the dispenser should be separated from those of the prescriber. We do not, however, agree that the preparation of drugs is "a mechanical thing, to be done by a pupil in his second year," but believe rather in the other proposition, that it is "a matter of pharmaceutical chemistry," and for that very reason we are astonished at the complaint afterwards made against us.

Pharmaceutical chemistry is a science requiring brains as well as industry and application for its acquisition, and if we cannot say that a pharmacist should be paid for "opinion" as the doctor is, we do say unhesitatingly that he should be remunerated for skill in addition to the bare price of the drugs he is called on to compound. He does not expect the statutable 3*s.* 6*d.* for a six-ounce mixture, which an apothecary demands, but he surely cannot be accused of extortion in charging at most half as much, and very often as little as one-third. We know not what may be the nature of the writer's prescriptions; he begins by saying the drugs must be good and in sufficient quantity. Does he ever see a mixture ordered to contain ½ a drachm of quinine and 2 or 3 ounces of tincture, to be taken in teaspoonful doses; enough of it prescribed to last the patient ten or twelve days? Does he reflect that if the profit on drugs were calculated on the same scale as on the common necessaries of life, there is not a chemist in the whole kingdom who could keep his doors open? The butcher's bill of a week would in many families be equal to the chemist's of a year, and, without disparagement to the former, we may say that the latter must be a man of superior education; in attaining that education he must have expended a certain amount of hard cash, and worked for four or five years of his life without remuneration; that being an educated man, called into communication with his customer in a somewhat confidential manner, he must at least maintain a respectable position in society. As a rule chemists are "not paid at once over the counter," but have to wait at least as long as doctors for their money.

We will tell our friend what would be the effect of such a reduction of charges as he proposes. The chemist would be driven more and more, in self-defence and for mere maintenance, to "feel pulses over the counter, even the pulses of affluent ladies," and seeing so many more prescriptions (as of course, according to the new system he would do), would be still better qualified than he now is to play the part of the doctor, which we agree with the *Lancet* in thinking he should never undertake.

Perhaps, too, even the affluent ladies might, with their poorer neighbours, imbibe yet greater faith in his skill and experience, and be even more inclined to consult him by reason of his moderate charges.

SANDFORD TESTIMONIAL FUND.

At the request of the Honorary Secretaries we have great pleasure in announcing to the subscribers to the above Fund, that the portrait of Mr. Sandford, which forms part of the testimonial, will be handed over to the Pharmaceutical Society at their Evening Meeting on Wednesday next.

At the present time, when the subject of pharmaceutical education is attracting so much attention, we think the discussion on the general subject of education at the meeting of the National Association for the Promotion of Social Science worthy the notice of our readers, especially with reference to the preliminary education of apprentices, and have therefore given a brief report of the proceedings on a subsequent page.

We are given to understand that the subject of the Betts' suits was not brought before the Pharmaceutical Conference at their late meeting on account of its being considered by several members of the Conference Committee to be purely a trade matter, and one foreign to the scope and object of the Association.

The Thursday evening meetings of the London Chemists' Association will be recommenced on the 6th of October, when an address will be delivered by Mr. J. Sands, the President.

At King's College the Introductory Lecture of the medical session will be given by Professor Wood, F.R.C.S., on Monday, October 3rd, at 3 P.M.

M. E. Gonod, Secretary of the Executive Committee of the French Pharmaceutical Congress, has informed his colleagues that on account of grave events which occupy the minds of all, it has been judged impossible to hold the meeting at Clermont-Ferrand at present, and it is accordingly adjourned until further arrangements can be made.

A letter has been addressed to the Editor of the *Daily Telegraph*, signed by Mr. Berkeley Hill and Mr. Ernest Hart, disputing the truthfulness of the statement made by a special correspondent of that journal concerning the medical officers in connection with the International Society, "that in no single military ambulance have any of these amateur medical assistants taken off their coats, so to speak, and gone to work like men at what they are engaged to do." Messrs. Hill and Hart give it as their opinion, founded upon personal observation, that, although there is a great want of organization, consequent upon the sudden and marvellous development of the Society's resources, and the entire absence of any previous machinery for the purpose, the conduct of the medical officers in the service of the British Society has been beyond praise, and characterized by the purest motives, as well as the most devoted zeal. A large number of Fellows and Members of the College of Surgeons, and Doctors of Medicine, sinking all distinctions, have willingly devoted themselves to dressers' work. There is a crowd of loafers wearing the red cross, but it is not believed that if their badges were examined any one of them would be found to bear the stamp of the International Society, or to be directly attached to the foreign ambulances.

The publishers of the American reprint of the *Chemical News* have decided to discontinue that publication, and in its place to offer to all interested in the progress of chemistry a new journal, entitled *The American Chemist*, to be devoted to theoretical, analytical, and technical chemistry.

The *Lancet* announces the failure of an experiment made to test the method proposed by Professor Gamgee for the preservation of meat. Two cases, a cask and an iron cylinder, to all appearance securely packed and thoroughly air-proof, were opened at the Melbourne Custom House in the presence of members of the Intercolonial Conference and others interested in meat-preservation. On the iron cylinder being opened, gas burst out with a hiss and immediately affected the organ of smell most powerfully. The meat in the cases also was in a putrid state. The whole consignment, weighing 527 lbs., was disposed of to the tallow-melters at 1*d.* per lb.

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

The following contributions have been received since last week:—

	£.	s.	d.
Wm. Bray, Buntingford	0	5	0
J. D. Fisher, Halifax	0	5	0
J. S. Robinson, St. Leonards-on-Sea	0	5	0
R. Rowe, 40, Alfred Pl. West, S. Kensington	0	10	6
Septimus Piesse, New Bond Street, for purchase of medicines for the sick and wounded French only	50	0	0
W. H. Stickland, ,, ,, ,,	2	2	0

Collections per Mr. I. H. Evans, Lymm:—

	£.	s.	d.
Edwin Brown	0	5	0
R. Dutton	0	2	6
J. Edwards	0	1	6
I. H. Evans	0	4	1
Thomas Hind	0	1	0
Charles Leech	0	2	6
Peter Mairs	0	2	0
Thomas Pearson	0	2	6
William Pearson	0	2	6
Miss Sharp	0	2	6
James Warburton	0	2	6
P. Warburton	0	1	0
George Watson	0	5	0
			£1 14 7

The above £1. 14*s.* 7*d.* was spent in the purchase of calico, etc., which was made into the following by Mr. and Mrs. Evans:—

28 cholera belts, stout flannel.
14 bandages, cotton, 10 yds. × 4 in.
41 ,, ,, 8 ,, × 3 ,,
20 ,, ,, 6 ,, × 3 ,,
24 ,, ,, 4 ,, × 3 ,,
19 ,, ,, 4 ,, × 2 ,,

I. H. Evans, Lymm:—
6 2 oz. bot. tinct. opii.
6 2 oz. ,, spt. ammon. co.
2 8 oz. ,, liq. ammon. fort.
1 8 oz. ,, chloroform.
6 gross pil. opii gr. i in bots. 4 doz. each.
3 ,, ,, quiniæ gr. ij ,,
3 ,, ,, morphiæ gr. ¼ in bots. 6 doz. each.
2 tins extract of meat biscuits.

J. Middleton, Middleborongh-on-Tees:—
20 lb. of lint.

The Food of the Armies.—The Germans appear to be a more hardy race than their opponents. They can eat black bread, the issue of which had to be prohibited among the French prisoners on account of their inability to digest it. *En passant*, we may state that the Germans have practically managed to solve for themselves the difficult problem of an economical and compressed ration for field purposes. Their soldiers, we read, on several occasions during forced marches consumed a diet composed of mixed peas and meat—a highly nitrogenous but not very digestible compound. The Rhine wines were always consumed where they could be procured, and we do not hear of a rum or spirit ration being issued, as in our army. The craving for tobacco exhibited by the troops, and their almost universal use of it, corroborate the opinion entertained by practical men that the consumption of tobacco is of real value to men undergoing the hardships of physical exertion incidental to a campaign.—*Lancet.*

Provincial Transactions.

CHEMISTS' DINNER, CARDIFF.

On Thursday, September 22nd, for the first time in the history of Glamorganshire, the chemists and druggists of the county sat down to dine together and inaugurate a personal intimacy and trade association amongst themselves. It was felt that the Exhibition of Fine Arts and Manufactures now being held in Cardiff, to which thousands are drawn daily from all the surrounding neighbourhood, was an opportunity not to be lost. Invitations were accordingly issued to about one hundred chemists throughout the county. The call, however, was not so liberally responded to as might fairly have been expected. To the honour of Pontypridd be it told that that town unanimously accepted the invitation, and subsequently furnished the chairman. All the chemists of the Rhonda Valley and Taff's Valley were also present, and Aberdare found a representative in Mr. Abel James. The majority of the trade in the town of Cardiff availed themselves of the opportunity of meeting their friends from the country. But it is to be regretted that such important towns as Merthyr, Swansea, and some others allowed the gathering to pass off without taking any part in it. The dinner was excellently served by Messrs. Cousins and Son at the 'Angel' Hotel, Cardiff.

The usual toasts, loyal, patriotic and clerical, having been duly acknowledged, the Chairman, Mr. CHARLES BASSETT, then gave "The Town and Trade of Cardiff," which was responded to by Mr. KERNICK, who from his long acquaintance with the town was well able to speak of its great and still rapidly-extending increase since the time when he came a stripling to assist the late Mr. Charles Vachell.

"The Outlying Districts" quickly brought Mr. JOHN JAMES, of Pontypridd, to his feet, who spoke well of the common interest each ought to feel in the welfare of the other, for whereas Cardiff would be nothing without the rich minerals of our hills and valleys, so those same districts would have ever remained unproductive but for the great outlet of our ports.

The CHAIRMAN then gave what may be called the toast of the evening, "The Pharmaceutical Society," and in speaking of the great opportunities held out by the Society, he gave some amusing anecdotes illustrative of the laborious trials and troubles of the apprentice in days gone by, and of the local peculiarities and nomenclature of the hill districts, which would completely baffle the scientific and successful student from Bloomsbury Square.

Mr. F. W. JOY, Hon. Local Secretary, responded, shadowing forth the great advantages offered to the rising generation of chemists, through the means of the Society, its well-appointed laboratory, courses of lectures and extensive library; he also enlarged upon the subject of the Benevolent Fund, which is open to any deserving distressed member of the trade, and strongly urged that each one should forthwith add his own name to the annual subscription list. Mr. Joy next spoke of the objects of the meeting, which he described as threefold, viz. the promotion of more personal and friendly intercourse among the members of the trade; the development and protection of trade interests, and though last, not least, the formation of some plan for the systematic education of the apprentices and younger assistants, which, since the passing of the Pharmacy Act, had become quite a necessity. He concluded by giving the health of the Chairman, the oldest member of the Pharmaceutical Society in the district, who had so ably presided at this their first meeting.

The CHAIRMAN thanked his friends for the honour they had done him. He had looked forward, he said, to the present meeting with some anxiety, for he considered in a town like Cardiff there were greater advantages for scientific pursuits than he could obtain in the country, and he felt considerable diffidence in occupying so prominent a position, but the kindly support he had received had so lightened his labours that he had never occupied the presidential chair with greater pleasure, and expressed his willingness to render the trade of the district all the assistance in his power on any future occasions.

The health of the "Vice-Chairman" (Mr. Joy), "Our Visitors" and "The Host," terminated a very pleasant and successful meeting.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A well-attended Meeting of the assistants and apprentices of the chemists in this city was held at the St. John's Rooms, on September 22nd.

Mr. HILL, having been unanimously voted to the chair, stated that the circular convening the meeting was issued by Messrs. Nuthall and Perkins. He therefore called upon those gentlemen to lay the first resolution before the meeting.

It was moved by Mr. E. NUTHALL, seconded by Mr. T. J. PERKINS, "That, in the opinion of this meeting, it is desirable to form an Association of Chemists' Assistants and Apprentices in Norwich, for the purposes of educational improvement and social intercourse; and that the said association be called 'The Norwich Chemists' Assistants' Association.'"

Moved by Mr. W. BUTLER, seconded by Mr. T. W. RICHARDSON, "That the affairs of the society be conducted by a President, Vice-President, Treasurer, Secretary, and a Committee of five, the President, Vice-President, Treasurer, and Secretary, to be *ex officio* members of the Committee."

Moved by Mr. E. MARTIN, seconded by Mr. P. H. MASON, "That Mr. Hill be elected President."

Moved by Mr. BUTLER, seconded by Mr. EKIN, "That Mr. Nuthall be elected Vice-President."

Moved by Mr. MASON, seconded by Mr. N. LINCOLN, "That Mr. W. Butler be elected Treasurer."

Moved by Mr. J. GOODENOUGH, seconded by Mr. R. BATEMAN, "That Mr. T. J. Perkins be elected Honorary Secretary."

Moved by Mr. NUTHALL, seconded by Mr. BUTLER, "That the following gentlemen form the Committee:—Mr. Canham, Mr. Ekins, Mr. J. Goodenough, Mr. N. Lincoln, and Mr. P. H. Mason."

Moved by Mr. BUTLER, seconded by Mr. T. J. PERKINS, "That the Committee frame a code of rules, to be submitted for approval to a general meeting of members, to be held within ten days."

After cordial votes of thanks to Messrs. Nuthall and Perkins for the active steps taken by them in promoting the formation of the society, and to Mr. Hill for his able conduct and courtesy in the chair, the meeting dissolved.

The greatest unanimity of feeling prevailed throughout, and at the close of the meeting the Secretary enrolled thirty-six members out of forty-two present.

The Wine Supply of Paris.—The *Pall Mall Gazette* says that if all the fermented liquors that pay the octroi duty are consumed in Paris, the inhabitants manage to dispose in the course of the year of no less than 365,000 tuns of wine—equal to forty-four gallons per head of the population, or almost a pint a day for every man, woman and child in the French capital; and this, too, in addition to 225,000 barrels of beer, nearly a couple of million gallons of cider, and more than that quantity of spirit. The authorities in Paris state that the water-supply of the city cannot be stopped by the Prussians; and the two immense depots which furnish France with wine are both within the line of the fortifications, and quite full. There appears, therefore, to be little fear of suffering from thirst, whatever prospect there may be of misery from starvation

Proceedings of Scientific Societies.

NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

Meeting at Newcastle-on-Tyne.

The Fourteenth Annual Meeting of the Social Science Congress was commenced at Newcastle-on-Tyne on Wednesday, Sept. 21, by a special service, at St. Nicholas Church, when a sermon was preached by the Rev. Canon Norris.

In the evening the Inaugural Address of the President, his Grace the Duke of Northumberland, was delivered in the New Town Hall to a very large assembly.

On Thursday the business of the Congress was commenced with an address by Mr. G. W. Hastings, the Chairman of Council, who said that in reviewing, according to annual custom, the work of the Association, the first place must be given to education, in respect of which the last session of Parliament had done so much to realize the hopes expressed at previous congresses. During the session the Education Committee had framed a report, many suggestions in which had been adopted by Government; and others which had been set aside would ultimately be demanded by public opinion. It recommended that public instruction should be placed under a minister of education responsible to Parliament, and until this was done the work of the department will never be carried on in the most efficient manner. Dr. Lankester and others have repeatedly urged the necessity for instruction in elementary physiology and the laws of health. Canon Kingsley had pleaded that physical science, and the use of the senses on objects immediately surrounding us, ought to form part of ordinary instruction. These suggestions are good, but practically of little avail unless we can improve the character of the teaching. Then we shall be prepared to take the serious step of deciding what was to be taught. At the bottom of the whole matter of improved school teaching there lies the question of the amalgamation of schools. At present the inspectors' return show a higher average of efficiency in large schools than small. It is better to have one school of 300 children than six of 50 each. The number of classes in the larger need scarcely be greater than in the smaller; but while the master in the small school will only be the superintendent of inefficient pupil-teachers, the large school will support an efficient master and a well-paid staff of assistants. The large-school system will do much to lift the profession of teaching from the dead dreary level which it now occupies, and give the country the services of a body of teachers made doubly efficient by the prospect of promotion. He advocated also the giving of scholarships and exhibitions in the national schools to carry the deserving boy into the secondary schools, and to let him start in the upward race with the self-respect of independence. He stated the object to be to enable any boy or girl, with the requisite ability and perseverance, to work his or her way from the parish school, or even the workhouse school, to the grammar school and the universities.

At the conclusion of the address the various sections assembled in their respective rooms to consider the questions coming before them. In the Education section, papers on the Amalgamation of Schools were read by Mr. Bourne and Mr. Imeson; and in the Health section there were papers on the methods of disposing of sewage and excreta, with a prolonged discussion. The usual Ladies' Conference assembled under the presidency of Lady Bowring. In the evening, Sir William Armstrong entertained a large number of the members of the Association at Jesmond Dene, and after the dinner there was a *soirée* in the Exchange Art Gallery.

On Friday the special question in the Education section was "By what means can a direct connection be established between the elementary and secondary schools and the universities?" Several papers were read on the subject, and in the discussion which followed, Mr. Pears, the General Secretary of the Association, said that Tasmania, with a population of 80,000, gave two scholarships to any British university the winners might select, the value of each scholarship being £200 a year for four years. According to the report of the Endowed Schools Commission, the money required for establishing a direct connection between the schools and the universities was already in existence, and he protested against the application of that money in simply providing education for the middle or upper classes. He suggested the continuation of the fee paid in the primary schools, but that every boy on reaching a certain standard—say, the seventh—should have the opportunity of passing for the same fee to the secondary or endowed school. After passing the necessary examination there, he should have the privilege of free admission to the university.

At the close of the discussion, Mr. R. S. Watson read a paper on the "Best Method of providing Higher Education in Boroughs." He pointed out that there is a great demand and need in large towns for opportunities of higher education. Most boys leave school at 16, and their education is supposed to finish, where it should, in any high sense, be beginning. If they go on with it afterwards, they do so alone and at great disadvantage. In all large towns professors should be provided, with sufficient salaries to admit of the class fees being very low, and classes for both sexes should be held in the evening, where those engaged throughout the day might carry out their studies in a systematic manner without reference to their position in life. A fund from which retaining fees could be paid, a greater number of highly trained teachers, and a connection with some recognized teaching body were required. Every large town should have an institution like Owens College, at Manchester. To the old universities, as the heads of education in this country, he looked for help in this matter. College fellowships might be converted into country lectureships, or the universities or individual colleges might contribute an annual sum towards the salaries of the professors, the borough to be benefited contributing an equal amount, and the professors being appointed by the university or college.

In the Health Department, Mr. Phillips Bevan, editor of the *Food Journal*, read a paper on "The Legislation to prevent Adulteration of Food and Drink." He said, that although it is one of our most important social questions, the apathy and ignorance of the public on the subject of adulteration is astonishing. As each person thinks that all others are mortal except himself, so he imagines that adulteration affects any class but his own; and although we acknowledge its prevalence, and cry shame when we read of any particularly bad case, the sensation is but momentary, and we go on our way as before. What is adulteration, and what does it mean? It means the lowering of the *physique* of the nation, the poisoning of the people, the deterioration of our constitution; and, morally, a fraud practised by the seller on the buyer, a cheating, to which we have become so callous that it has hardened our conscience for honesty in other and bigger things. The great difficulty in dealing with it is that the Government is so slow to move, and even men in high places practically defend it by declaring that it is not so bad as it might be, that the buyer must look to himself, and so on. It is also a very common argument that people bring adulteration on themselves by buying such very cheap articles—so cheap that they cannot be good for the money. But they do so in ignorance, and if the seller were compelled to label his goods with the names of the real ingredients, such as 'best butter mixed with starch, mashed potatoes, and horse-bone oil;' 'coffee, with bread-crumbs and sand;' 'tea, with iron-filings;' 'sugar, with chromate of lead;' 'beer, with salt and cocculus indicus,' it is not the least likely that their cheapness would tempt the buyer; and if a certainty of detection and punishment followed, we should find that the sellers would think twice before they offered such articles. It is strange that, in all our sanitary machinery, the food question and its purity have been so overlooked; but pure food is as necessary as pure air, good drainage, or wholesome water; and it ought not to be left to the philanthropist to remedy the evil, with the tolerable certainty that he will only get snubbed for his pains. It is a Government question, and it ought not to be the duty of a private member of the House of Commons to bring in a Bill. With a view to arouse public interest he had established the *Food Journal*, in conjunction with Messrs. Johnson, feeling that there was a great want of some public organ to discuss these matters; and so convinced was he that no Bill could properly be passed without the knowledge of the legislation which prevailed in other countries, that he applied to the late Earl of Clarendon for permission to address the various consuls on the subject. His lordship not only gave the permission, but evinced his great interest in the matter by requesting him to draw up a circular, embodying all the inquiries on food matters that he wished to make. A thousand of these were sent out by the Foreign Office to all the Consulates and Legations; and Earl Granville, who has taken up the subject in the same warm and earnest spirit as evinced by his predecessor, has forwarded for publication in the *Food Journal* a mass of valuable information, which has never before reached this country. To detail even an epitome of these answers would take up far too much of the time of the meeting. He would, therefore, only briefly touch on some of the main points of the first question of the circular, viz.:—'What legislative enactments at present exist in the country to which you are accredited respecting the adulteration of food and drink? Are these laws actively enforced, and how far do they appear to meet the evil?' Very valuable information came to us from the United States, in Mr. Thornton's report, which adverts to the difficulty of getting systematic information, even through the well-arranged machinery of official correspondence. The State legislation varies very much in the different States, some possessing no legislation at all, and others inflicting very severe penalties. Each State legislates independently, and, in so doing, often delegates the regulation of these matters to the various town or county authorities within its borders. As a general rule, the adulteration of alcoholic liquor is almost universal. The paper then sketched the punishments meted out to those who adulterate food and drink in Rhode Island, Vermont, Ohio, Indiana, Illinois, Missouri, Mississippi, Cincinnati, Georgia, and Texas, as well as in Prussia and Holland. It showed that severe fines and long periods of imprisonment are commonly enforced, and that there are places in which the penalties are whipping, and even death, if fatal results ensue. In Holland punishment is also provided for persons who manufacture or sell ingredients for adulteration; so that the flourishing business known in England as that of a brewer's or distillers' druggist must be there pursued under considerable disadvantage. It proceeded:—"Any fresh legislation on this subject should be compulsory in its character, and not permissive. All articles of consumption which are manufactured should have their ingredients declared, for there is a feeling prevalent among manufacturers, as for instance cocoa-makers, that as long as their articles contain nothing hurtful, they are at liberty to call them by the general name of cocoa. Still, a sophistication is, to a certain extent, a fraud, and every purchaser has a right to know what he is purchasing; and, although we might be safe in the hands of the largest and most respectable manufacturers, there is a considerable class of unprincipled makers who are not above taking advantage." Differences of opinion sometimes occur as to the relative hurtfulness of certain common adulterants, and an eminent authority had assured him that he had grave doubts as to whether alum was not a good thing instead of a bad one. He suggested that there should be a Food Sub-department formed, which should take cognizance of all food legislation and supplies. To it a board of two or three of the most eminent analytical chemists should be attached, who should examine and pronounce upon all disputed chemical questions, and whose opinion should be law. The sub-department should have the election of, and a certain amount of control over the county and borough analysts, whose appointment should be compulsory and not permissive; neither should it rest with vestries or corporations, many of the members of which are often largely concerned in adulteration. Inspectors should have power to visit and take samples from all dealers in articles of food, subject to certain checks, so as to prevent any risk of tyrannical domiciliary visits. They should also have the power of testing the supplies furnished to public bodies, such as union contracts, for guardians have frequently a habit of accepting tenders for food at a price at which the real article cannot possibly be supplied, as a London Union Board did the other day in the case of butter. In cases where a petty dealer declares his ignorance that the goods which he sells are adulterated he would make the onus of proving this fall upon him, and then it would be for the Food Sub-department to take the matter up and prosecute the manufacturer. In adulteration before importation, as in the case of the Maloo tea mixture, the department might well provide the machinery for setting consular and other influence to work to prevent it, and might also step in as the proper arbiter between conflicting interests. In this very case a great fraud on the public was allowed to go unpunished because the Customs could not legally forego the duty. As to offences, when proved, he was no believer in either a very small or a very large fine, but he would have no sliding scale at the option of the magistrate. For the first offence the penalty should be sufficient to make the offender smart in his pocket; for the second, he would double it, and have an *affiche* detailing the offence put outside his door, as also outside the door of the church, police-station and town-hall for a month. The case should also be advertised in the local papers at the offender's expense. For the third offence there should be imprisonment for one month, with hard labour. Adulteration is either a fraud or it is not, and it should be punished like any other cheating.

An interesting debate followed, in which Mr. Rawlinson, Mr. Godwin, Mr. Serjeant Cox, Dr. Farr and other gentlemen took part. The facts and arguments brought forward by Mr. Bevan were generally admitted and assented to, and resolutions were passed recommending local authorities to appoint analysts, whose duty it should be to examine food and drink at the instance of purchasers, and recommending the Council to take steps to secure an amendment of the law.

A paper was afterwards read by Mr. Daglish on "Local Boards of Health," and one by the Rev. H. Moule on "Earth Closets."

On Saturday the members of the Association assembled in the morning to hear an address from Dr. Lyon Playfair, the President of the Education Department. He expressed his opinion that with all its defects the Act of last session is an enormous stride in advance of the old system of contributory help under which schools multiplied but education slipped backwards. He complained, however, that it dealt with the quantity of education, but not with its quality. The improvement which was gradually being developed in the village schools had been thrown back by the State, which had made them mechanical manufactories, turning out no end of yards of the three R's, in standards one, two, and three, but very few in standards four, five, and six, because the latter do not pay. Dr. Playfair proceeded: even in the least productive of arts, that of war, a State is served by the universal education of her soldiers. The educational principle of Continental nations is to link on primary schools to secondary improvement schools. The links are always composed of higher subjects; the three R's being in all cases the mere basis. Elementary science, and even some of its applications are encouraged or enforced. Our primary schools do not teach higher instruction than a child eight years of age may learn. No armour-plate of knowledge is given to our future artisan, but a mere thin veneer of the three R's, so thin as to rub off completely in three or four years of the wear and tear of life. So, under our present system, no knowledge bearing on the work in life of the people reaches them as a result of State education. And yet we are surprised at the consequences of their ignorance. A thousand men perish yearly in our coal mines, but no schoolmaster tells the poor miner the nature of the gas which scorches him, or of the after-damp which chokes him. Boilers of steam-engines blow up so constantly that a Committee of the House of Commons has been engaged in trying to diminish the frequency of such explosions, but the stokers who are scalded to death or blown to pieces were never instructed in the nature and properties of steam. In Great Britain alone more than 100,000 people perish annually, and at least five times as many sicken grievously, out of pure ignorance of the laws of health, which are never imparted to them at school, and which, as they pass into no secondary schools, they have no chance of learning afterwards. Our pauperism, our crime and the misery they produce, increase terribly; and our panacea for their cure is teaching the three R's up to standard 3. Our large faith in our little doings will not remove mountains. Our low quality of education is impoverishing the land. It is disgracefully behind the age in which we live and the civilization of which we boast. In the schools prior to the Revised Code words instead of ideas were worshipped. The teaching of science is the reverse of all this, and will go far to remedy its defects. The whole yearnings of a child are for the natural phenomena around until they are smothered by the ignorance of the parent. Do not suppose that I wish the primary school to be a lecture-theatre for all or any of the "ologies." While I advocate the introduction of higher subjects into our schools I wish them to be of immediate interest and applicability to the working classes. Six months spent in teaching future labourers the wanderings of the children of Israel is sheer waste of time, as regards either their temporal or their eternal interests. If you bring up a ploughman in utter ignorance of everything relating to the food of plants, of every mechanical principle, of farm implements, of the weather to which he is exposed, of the sun that shines upon him and makes the plants to grow, of the rain which, while it drenches him, refreshes the crops around, is that ignorance conducive to his functions as an intelligent being made after the image of Him who has done all things wisely? In all the operations of the field, from the breaking-up and manuring of the soil to the harvesting of the grain, which of the two men would feel that he had the most noble education—the ignorant clodhopper knowing nothing that he is doing, the mere tool or slave of his master, or the worker, intelligent, and knowing his occupation, aiding nature to fulfil her wise laws, and by doing so feeling himself like St. Paul, and with his humility also, to be "a fellow-worker with God?" I have selected for illustration the occupation in which the working-man is now the least cultured and intelligent, but there is not a single craft which could not be dignified in a similar way. Let me, then, refer you to an example, scarcely known, as it is separated from us by stormy seas, but singularly instructive and significant. Those of us who have passed middle life recollect the chronic state of misery and poverty in the Scilly Islands, off the coast of Cornwall. In such a wretched condition were they that the inhabitants were only preserved from starvation during the winter months by constant contributions from the mainland. Now we never hear cries of distress from these islands, and for what reason? In 1834, Mr. Smith, who became their proprietor, undertook their improvement. He abolished the cottar system, consolidated holdings, founded good schools under a compulsory system of his own, and kept them up to the mark by constant inspection. He did not content himself with the three R's, but directed the instruction towards the occupations of an insular people. History, geography, the rudiments of mathematics, and navigation were taught to the children. And with what result? So much esteemed are the youths of the Scilly Islands as sailors that vessels sometimes stop there to procure them, and very frequently they rise to be mates and masters. Pauperism has vanished from the islands, so that it is difficult to find any of its population poor enough to accept the alms offered in the Communion Service. The well-educated population show a disposition to pass to the mainland, for they are much appreciated there, and receive high wages.

BRITISH PHARMACEUTICAL CONFERENCE.

Tuesday, September 13th.

Notes on the Cultivation of the Opium Poppy in Australia.

BY JOHN W. HOOD, CHEMIST, MELBOURNE.

This paper was communicated by Mr. T. N. R. Morson, together with the following letter addressed to the Chairman of the Liverpool Local Committee:—

"38, *Queen's Square, W.C.*,
"*September 10th*, 1870.

"My dear Mr. Abraham,—I this day send you the paper on Opium received last mail from Melbourne; it is a highly interesting paper, and at the present time a very important one. I have no doubt that very good opium can be produced in Australia, and at a reasonable price. To the inhabitants of this part of the globe its home culture is very important, on account of the heavy duty on that imported from Europe. I have examined several samples sent me at various times, and although they varied very considerably in the quantity of morphia they contained, I considered them all to be *genuine opiums.*

"I also send you the specimens I received per post with the paper, please exhibit them. I should like to have them returned to me after the Conference is over. I wish to test some of them, and afterwards to send them to the Museum in Bloomsbury Square, in Mr. Hood's name. "T. N. R. Morson."

The farmers in Victoria, for a good many years, have been touched with a desire to try new crops and new industries. Among the many ventures, suitable or unsuitable, was the cultivation of the poppy and the production of opium, which has been tried with varying success for the past four or five years.

I have felt some interest in this subject and have collected many samples from various districts, and also performed some rather crude experiments myself on the growth of the poppy, which I beg to submit. I feel that, perhaps, my conclusions may be of little value, but as I propose extending my investigations annually, I hope eventually to arrive at the best means of producing the greatest amount of opium together with richness in morphia, from a given quantity of poppy plants.

The first opium produced in any quantity in Victoria was at Sunbury, a village about twenty-two miles from Melbourne. Soil strong, rich, volcanic. It* was a good-looking opium; on analysis it only yielded some 2 per cent. of morphia, but contained an abnormal amount of other opium constituents, notably narcotine, of which there was about 8 per cent. I sent samples of this, and other opium from about the same locality, to T. N. R. Morson, Esq., who, as reported in the Pharmaceutical Journal for January, 1869, stated, "It was of great

* Sample 1.

beauty as far as external characters were concerned, it had the perfect odour of good opium, and it dissolved with the Persian character, but singular to say it contained very little morphia, but a great abundance of the other principles known to exist in opium."

This opinion, from so well known an authority on all concerned with opium, of course reached Melbourne, and was published here with the effect of greatly discouraging the industry. However, a few did continue to plant and produce, and this last season probably a hundredweight and a half were brought into the market here, where it realized about thirty shillings (30*s.*) per lb., as it proved to be a very good opium, containing from 8 per cent. to 10 per cent. of morphia.

Mr. Morson's opinion being so much thought of, I sent him samples. His report being a favourable one, I had it published in the agricultural papers, and now some attention is again given to the opium culture, and I expect that sufficient will shortly be made to enable a trial shipment to be made to London, as from the high price ruling for opium and its preparations it is very desirable that new sources of supply be discovered. With the beautiful climate and fine soil of Australia eminently adapted for poppy-growing, enough opium should be produced to make a marked influence on the price in the European markets, as the growers here will be well paid at from ten to twelve shillings per pound; but as our consumption here is enormous, owing to the great number of Chinese colonists, it will probably be some years before the supply greatly exceeds the local demand.

I send herewith samples of opium from various localities, produced in 1867–8, 1868–9 and 1869–70.

The poppy is sown here in the months of June, July and early part of August, the opium being collected in the summer months of January, February and March. Most of the seed was obtained from Smyrna, and produces plants from five to seven feet high, each bearing three or four flowers of four large white petals. There is also some East Indian variety cultivated with double purple or black flowers, but it is not popular, as it only has one flower on each plant and yields but little opium.

In 1868 I was desirous of ascertaining whether special manures or manner of culture had any influence on the amount of opium yielded and its richness in morphia, and, to determine it, made the following experiments:—

I took six plots of virgin ground and treated them as follows:—

Nos. 1 and 4 were manured with well-decayed stable manure.

Nos. 2 and 5 were entirely without manure.

Nos. 3 and 6 were manured with spent lime from soft-soap works, containing about 3 per cent. of potash and with Peruvian guano.

Each plot was the same size, and was drill-sown with the same lot of seeds on the following dates:—

Nos. 1 and 2, sown on June 13th.
Nos. 3 and 4 ,, July 1st.
No. 5 ,, ,, 12th.
No. 6 ,, ,, 20th.

The plants were all above ground about ten days after each sowing, and about a fortnight after I thinned them out, leaving 150 plants on each plot. Plots 1, 3, 4 and 6 received no artificial irrigation, but depended for moisture entirely on the rainfall, while Nos. 2 and 5 were watered well every week until just before flowering. When ripe, I carefully cut the heads and collected the opium, obtaining the following yields:—

No.	Yield of Opium in Grains.
1	153
2	177
3	159
4	171
5	189
6	203

The greatest yields were from Nos. 5 and 6, the last planted. Nos. 2 and 5, which were without manure, but with plenty of moisture, yielded much more than Nos. 1 and 4, those manured with stable manure. The opium was of the ordinary consistence, and, as far as possible, free from leaves or accidental impurities. Now, as to the richness of the samples in morphia.

On assay from *one hundred* grains of each sample, well dried, I obtained:—

No.	Grains of Morphia.
1	$4\frac{2}{10}$
2	$6\frac{3}{10}$
3	$6\frac{9}{10}$
4	$4\frac{6}{10}$
5	$6\frac{5}{10}$
6	$7\frac{1}{10}$

I also obtained a notable quantity of morphia from the aqueous extract of the bruised green heads from which the opium had previously been as far as possible extracted.

As the same seed, differently treated, gives plants which yielded opium of different values, I naturally infer that manures, nature of soil, want of moisture, or excessive supply of water, and general manner of cultivation, have a great influence on the value of the opium produced. Last season (1869–70) I performed the same experiments with relatively the same results. This year I hope to extend my operations and try many other manures, and have requested all who are growing opium to favour me with all particulars respecting manures, soil, mode of culture and collection and yield, and, if possible, a sample of the opium.

I cannot imagine my experiments as at all conclusive, as the differences might have occurred on different parts of the same ground; but if I find that treatment with stable manure, as a rule throughout the colony, gives a worse yield than if manured with guano, I may then reasonably think that Peruvian guano is more fit for manuring poppies than stable manure; and so on, until I arrive at the best manure and best method of cultivation of the poppy, so as to obtain the greatest and most valuable yield of opium.

Samples of opium accompanying this paper:—

No. 1. Produced in 1867–8, from 80 poppies, at Sunbury, twenty-two miles from Melbourne.

No. 2. Produced in 1869–70, near Gisborne, thirty-two miles from Melbourne, on a river-flat of rich alluvial soil; yield 84 lbs. per acre.

No. 3. From near Bairnsdale, Gipp's Land, in a very cold climate, yield over 60 lbs. per acre.

No. 4. From near Gisborne, 1867–8; yield 50 lbs. per acre.

No. 5. Grown in 1868–9, at Soh Yarra, near Melbourne, collected and dried on tin-plates, so that it is the pure juice dried.

No. 6. Grown in 1868–9, at Dromana, on the shores of Port Phillip Bay, in very sandy soil; the produce of 420 plants.

Mr. Dymond (Birmingham) observed that the plan adopted by the author of cutting off the poppy capsules, and then extracting the opium from them, was not that practised in the East. He had made experiments with garden poppies.

Mr. Sutton (Norwich) said that some years ago a medical gentleman in his neighbourhood grew a considerable number of poppies, and extracted opium by incision from day to day, but the air-dried gum contained less than 2 per cent. of morphia. The season, however, was damp and somewhat cold, and this he (Mr. Sutton) believed was detrimental to the production of any large proportion of morphia. The question was really very little understood, but from experiments in various parts of the world it seemed an undoubted fact that fine, dry, warm weather produced, in any tolerable climate, a fair quality of opium; whereas, in a contrary season, the other and less valuable constituents (narcotine, etc.) were predominant. It was therefore probable that the effect of sunlight and warmth would be to convert a portion of these constituents into the more valuable form of morphia. He also stated that it was his intention to grow some poppies in his own district, should he able to procure good seed, and also forward some to Australia, for the purpose of investigating the matter more fully.

Mr. Dymond remarked that in his opinion we ought to go to Smyrna for seed.

Mr. Brady said he understood some of the Norfolk specimens of opium contained a very large percentage of morphia. He believed it was considered impossible to produce opium on a large estate with a large staff of labourers; and in Asiatic Turkey poppies are grown for the purpose only by small farmers. The French had tried the growth of poppies in Algeria, but with little success, so that other conditions besides climate seemed to be requisite. The extract of poppy capsules had been found by Mr. Deane and himself to differ entirely from true opium in microscopic characters.

Mr. Groves (Weymouth) expressed his belief that the production of opium was a continuous process of the incised poppy, and, therefore, that the proposal to obtain opium, or anything resembling it in strength, by expressing the unripe capsules, would prove delusive. He had himself, on two occasions, examined carefully the ripe capsules. On the first occasion, he had recovered sufficient alkaloids to justify further experiment. The second experiment was conducted upon 50 lbs. of crushed capsules. From that large quantity was obtained, narceia 23 grs., morphia 75 grs., narcotine 36 grs., codeia 33 grs. He had a decided impression that the "crushed" capsules were inferior in quality to the "poppy-heads."

Analysis of Bitter Cassava Juice, and Experiments in Elucidation of its Supposed Antiseptic Properties.

BY PROFESSOR ATTFIELD, PH.D., F.C.S.,

Professor of Practical Chemistry to the Pharmaceutical Society.

The bitter cassava (*Manihot utilissima*, Pohl) is a plant whose tuberous roots yield the starch which, when granulated, is known as tapioca. The juice of the root is said to be somewhat poisonous, but, when heated, the noxious principle disappears, and the concentrated fluid is used as the basis of various sauces (cassareep). This juice, freed from starch and boiled, is commonly believed to be a powerful antiseptic. (Shier, 'Report on the Starch-producing Plants of the Colony of British Guiana,' Demerara, 1847; Hamilton, Pharmaceutical Journal, 1st series, Vol. V. p. 30.)

A specimen of the "boiled juice of the bitter cassava," having a dark brown colour and a consistency of thick cream, was recently sent to me from Jamaica (through Mr. Shepherd, of Chester), with a request that it should be analysed and otherwise examined, with the view of ascertaining whether or not its stated power of preventing decay in meat rendered it worthy of application as a preserving agent on a large scale. The following analytical and other experiments were conducted:—

One hundred parts of the juice contain

Water		39·2
Vegetable matter:		
Albuminoid substance	9·0	
Alkaloidal bodies	none	
Volatile oil	trace	
Cane or grape sugar	none	
Starch	none	
Mucilaginous and other inert matter	37·7	
	——	46 7
Mineral constituents:		
Iron (as peroxide)	2·8	
Other inorganic salts	11·3	
	——	14·1

Experiments.

First Series.—Several cooked mutton chops were well rubbed with various quantities of the juice, and others lightly rubbed, and some smeared or covered. These and a raw chop were set aside in separate cupboards. In two days the raw chop was tainted, and in three putrid. In three days one chop gave evidence of mould; in four days more mould, on the others also: in five to eight days, all more or less mouldy; on the seventh day one chop tainted; on the eighth to twelfth, all were tainted and some putrid.

Second Series.—Some cutlets cooked in water containing small and large quantities of cassava juice, and one cooked without juice, were set aside in separate cupboards. In seven days, the cutlet without juice was putrid; in fourteen days, the others had become mouldy and putrid, more or less quickly, and to a greater or less extent.

Third Series.—Beef was affected in a similar manner, and to about the same extent, as mutton.

Fourth Series.—Extract of meat was diluted with warm water, and three portions set aside.

a. Unflavoured.
b. Flavoured with salt and pepper.
c. Flavoured with cassava juice.

In four days, *a*, the simple diluted extract, was tainted, and in five putrid. In five days, *b* and *c* were slightly mouldy; in nine days tainted, and in fifteen putrid,—each to about the same extent.

Remarks.

The analysis and other experiments show that cassava juice contains nothing that imparts to it antiseptic powers of great value. Its property of slightly retarding the decomposition of raw or cooked animal matter is not greater than that possessed by such common aromatics as pepper; and wholly inadequate to warrant its employment in preserving meat on any large or important scale.

The foregoing experiments were conducted at temperatures of atmosphere varying from 60° to 80° F., in different places, and under other varying conditions. The sample of juice was apparently of average quality, though containing a larger proportion of iron than is present in a specimen in the Museum of the Pharmaceutical Society. Nothing was wanting to make the examination fair and crucial.

I am of opinion that the slight antiseptic character of bitter cassava juice is due to the presence of a very small quantity of aromatic oil, and that the juice is of no practical value as an agent for preserving meat.

Since these experiments were made, larger trials of the juice have been conducted in Jamaica, with similar results to those now described.

On the so-called "Citrate of Magnesia" of Pharmacy.

BY MR. F. M. RIMMINGTON.

There appeared in the Pharmaceutical Journal for June 15th a letter by me on a mode of estimating the value of the so-called citrate of magnesia by estimating the amount of carbonic acid; and I then stated that the amount of acid was influenced by two causes, either by bad management, thereby driving off by heat too much of the carbonic acid, or, by the diminution of the proportion of the bicarbonate of soda, and also, as a matter of course, that of the tartaric acid by increasing the proportion of sugar; for it follows as a natural consequence, that if one of the constituents be increased, the others will be diminished in the same ratio in 100 parts. Now, the goodness of the article depends upon its agreeableness as a beverage, and this again depends upon the amount of carbonic acid given off at the time of mixture.

Since writing that letter I have examined several samples, and tabulated the results below.

The letters A, B, C distinguish samples from three different makers. Those not marked are miscellaneous samples.

One sample of "A," on analysis, gave 44 per cent. of bicarbonate of soda, but only yielded 15 per cent. of carbonic acid, being only two-thirds of the quantity that had been present originally.

A sample of "C" contained 32 per cent. of bicarbonate of soda, and yielded 8·2 per cent. of carbonic acid, being only one-half the amount that must have been in combination with the soda.

Table of Analytical Results.

No. 1	contained	12	per cent.	CO_2
2	,,	9	,,	,,
3	,,	8	,,	,,
A 4	,,	15	,,	,,
B 5	,,	16	,,	,,
6	,,	12·5	,,	,,
C 7	,,	10·5	,,	,,
B 8	,,	13	,,	,,
A 9	,,	16·7	,,	,,
10	,,	9·3	,,	,,
C 11	,,	8·0	,,	,,
B 12	,,	12·5	,,	,,
A 13	,,	14·8	,,	,,
B 14	,,	14	,,	,,
A 15	,,	15	,,	,,
C 16	,,	8·6	,,	,,

The average of four samples marked A is 15·4.
,, four ,, ,, B ,, 13·9.
,, three ,, ,, C ,, 8·9.

The difference between the highest and the lowest being double the amount of carbonic acid, and, as a consequence, one-half the quantity of A would make as good an effervescing draught as double the quantity of C,—a difference too great not to be perceptible.

Mr. Groves remarked that the antiseptic properties attributed to cassareep were perhaps suggested by the little tendency to decomposition shown by the fluid from which it was manufactured. But this fluid contained a notable quantity of prussic acid, the influence of which in retarding fermentation was very remarkable. Of course cassareep would contain none of this volatile body; it must necessarily be dissipated during evaporation.

Mr. Sutton (Norwich) said that the preservative properties of the "cassareep" must be very considerable, as he believed it was the custom of families in Jamaica and other places in the West Indies, to keep a large pot of the prepared juice in the house, into which were thrown odd pieces of cooked meat, bones, etc., where they were preserved for almost any length of time. So long as they were kept under the surface no decomposition occurred.

Mr. Dymond (Birmingham) protested against the Conference officially recognizing the application of the term "citrate of magnesia of pharmacy" (which was the title adopted for this paper) to this preparation, inasmuch as it was a complete misnomer. He had formerly objected to it, and thought the preparation should at most be termed citrate of magnesia of commerce. It was in reality a mixture of tartaric acid, sugar and carbonate of soda. He thought this Conference, as representing and expressing the highest aims of pharmacy, ought to maintain a scientific purity and exactness in its nomenclature.

Mr. Sumner endorsed this opinion, and thought it derogatory to the pharmaceutical body that the practice should exist; and this was not the only misnomer the Conference ought to denounce. Similarly improper names were continually creeping in from time to time.

Mr. Abraham asked how this material was to be labelled when sold?

Mr. Dymond replied that he always labelled it "citrate of magnesia so-called."

Mr. Sutton considered it should be labelled "granulated tartrate of soda."

Mr. Williams (London) said citrate of magnesia was easily made, and was very pleasant tasting. For that purpose calcined magnesia and crystallized citric acid should be heated together without any addition of water. Under these conditions they united together, forming a soluble salt.

Mr. Sumner said that he believed that King's was a real citrate of magnesia.

Mr. Abraham said he had not analysed King's, but he believed that it was composed of bicarbonate of soda, tartaric acid, and sulphate of magnesia.

Mr. Sutton, of Norwich, had subsequently examined this medicine, and found it to consist of bicarbonate of soda, tartaric acid, and sulphate of soda.

Mr. Brady, whilst deprecating the use of names conveying a wrong impression as to composition, thought that, to be consistent, those who advocated an abrupt change in this particular case must extend their protest to "seidlitz powders," "salt of lemons," and a number of similar terms for articles in very general demand.

Mr. Sandford (London) was glad this question of misnomer had been brought forward; he had always protested against applying definite chemical names to articles not having the composition thereby designated, and he thought it was specially the duty of this Conference to discountenance such practice. The evil was increasing; we had effervescing "nitrate of potash," of which a drachm would contain 5 grains, but what was the other portion of the powder? It was, too, a matter of importance to dispensers. Physicians sometimes prescribed "effervescing citrate of potash," for which in one shop ordinary "lemon and kali" would be supplied, in the next citrate of potash, throwing doubt into the mind of the patient.

Mr. Phillips (Crewe) had been accustomed to sell this preparation in Paris under the name of "granular effervescent aperient," in bottles with "citrate of magnesia" stamped on them. The French Government would certainly prevent its sale under the false name commonly adopted in this country. Citrate of magnesia is there largely employed in doses of 40 to 60 grams as a saline purgative, and is known under the name of "Limonade Purgative."

Mr. Groves confirmed the statement made by the last speaker as to the dose of true citrate of magnesia given in France being 60 grams, or about 2 ounces. If the alkaline citrate or tartrate were given, they underwent a process of combustion in the organism, and became carbonate before elimination by the kidneys. This should be recollected by prescribers.

Mr. Andrews (London) said that Mr. Albert E. Ebert, of Chicago, had suggested that the term "granular effervescent salt" should be applied to the preparation commonly known as "granular citrate of magnesia."

Mr. Umney (London) said he had never found more than 17 per cent. carbonic acid in the samples of citrate of magnesia he had examined.

It was then moved by Mr. Dymond, seconded by Mr. Sutton,—

> "That this Conference is of opinion that the term 'citrate of magnesia,' as applied to the ordinary granulated preparation of commerce, is a misnomer, and should be discouraged as inconsistent with the true interests of pharmacy; and seeing that a similar compound is already recognized by the British Pharmacopœia of 1867 as 'citro-tartrate of soda,' this name should as rapidly as possible be brought into general use."

Mr. Greenish objected to the special character of the latter part of the resolution, and considered that there was no necessity for alteration of name so long as granular effervescent citrate of magnesia was only a commercial article, and one never prescribed; if difficulties were thrown in the way of its retail sale by chemists, grocers would necessarily take it off their hands.

Professor Attfield thought this a very difficult question to deal with by any formal resolution. Should we not have "soda-water," "seidlitz-powders" and such articles, next brought under similar condemnation?

Mr. Umney considered that the pharmacists were in the hands of the physician for such granular preparations as effervescent "nitrate of potash," and in those of the public for the popular "citrate of magnesia."

Mr. Savage (Brighton) said whilst the discussion was one of some importance, it seemed to him undesirable to make any alteration of a name so well known to the public, and the best course to adopt would be to avoid committing this Conference to any resolution not likely to be generally adopted.

Mr. Reynolds (Leeds) thought that the second part of Mr. Dymond's motion deserved support fully as much as the first, since prescribers were liable to overlook the large quantity of alkaline citrate and tartrate united with the remedy they prescribed, but not indicated by the name employed.

Mr. Abraham (Liverpool) suggested that the term "citro-tartrate of soda," commonly called citrate of magnesia," should be used. He objected to the term "granular effervescent aperient," inasmuch as no pharmaceutical description was comprised in such a name.

Mr. R. M. Atkinson (Leeds) thought it was no secret that the article was entirely wanting in both citric acid and magnesia, as citrate of magnesia could not be made at the price at which this was offered in the market; he therefore considered it an imperative duty of the Conference, if it wished to hold an honourable position and retain the confidence of the public, that not only in the present instance, but for the future, it should condemn all such impositions when brought before it.

Mr. J. H. Richardson (Cork) said he entirely approved of the resolution.

Mr. Mackay (Edinburgh) felt a difficulty about the second part.

Mr. Ince (London) took the same view, and the mover having consented to an alteration, the motion was carried as follows:—

> "That this Conference is of opinion that the term 'citrate of magnesia,' as applied to the ordinary granulated preparation of commerce, is a misnomer, and ought to be discouraged as inconsistent with the true interests of pharmacy."

SOCIETY OF ARTS.*

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture III.

In referring, at our last meeting, to the place in nature which ought to be assigned to these little organisms of which we have been speaking,—the ferments,—I stated one ground which appeared to me conclusive, or very nearly so, in favour of placing them in the animal and not in the vegetable kingdom. That ground was a chemical one, viz. that these organs assimilate, or, to use a homely phrase, they feed upon very complex substances, and they give off, during their vital functions, less complex substances. That circumstance appears chemically conclusive in favour of their being rather animals than plants, for plants build up complex substances, and animals assimilate the products which plants have formed, and break them up into simpler ones. There are, however, two other considerations which I think are of such importance that it would be undesirable to pass them over, which tend in the same direction, and are striking confirmations of the conclusion to which we then came. The one is, that whereas plants require for their growth the light of the sun—in fact, their very growth is a process of absorption of heat by their leaves from the rays of the sun—and plants by doing so render heat latent, as we sometimes express it, that is, they cause an apparent disappearance of heat, and lower the temperature of the surrounding space; animals, on the contrary, give off heat during the exercise of their vital functions, and do not need to be exposed to heat or to continuous light for their growth. Now, in both these respects, as in the other respects, these little cells, the ferments, appear to be distinctly animals. I do not know of one case of a ferment requiring or using for its vital processes the light of the sun; they usually grow, and they seem to thrive quite well in the dark. Again, there are well-known cases in which, during their vital functions, they evolve or give off heat, so that I think these are very overwhelming reasons for not considering them as vegetables in their functions, but rather as animals or animal atoms. I have on the table here three or four liquids, which are in states of fermentation, of which I have already had occasion to speak several times. This first carboy contains an extract of malt, to which common cane sugar has been added, and some brisk, thriving yeast was then introduced. Effervescence is now rapidly going on, as you may hear by the gas—carbonic acid—which is escaping through the bent tube into the vessel containing lime-water. This liquid contains little soft, nearly round particles, which I was just speaking of as animals, though they certainly do not look like animals. The second flask contains another substance, of which I also spoke the other evening. There is here what I might call gastric juice—it is a mixture made for the purpose of getting lactic acid from sugar. Some pepsine was made to digest a certain quantity of white of egg, and that mixture, whilst still acid, I mixed with some common cane sugar, and put into it some alcoholic ferment, or common yeast. A good deal of the yeast was digested, it disappeared and was dissolved. I thereupon put in more and more, until there was an excess of it left in the flask. It was then kept for upwards of a week in a box which I have been using for the purpose of these fermentations—a metallic box, which is kept, by means of a regulated gas-burner, at a temperature of about 30° Centigrade, or a little above blood heat. During that time the substance has been gradually undergoing a change or fermentation. It became strongly acid, and I then added a base, at one time potash, and afterwards powdered marble or carbonate of lime, which was dissolved by the acid, and thus a quantity of lactic acid was formed. Here also there are little cells, which, under the microscope, can be seen to be different from those in the first mixture. They are smaller in their dimensions, but yet they present no very marked individual characteristics by which they can be identified. Indeed the chief, or, I may almost say, the only thing by which we can certainly identify any one of these organisms is by setting it to work, and by seeing what work it performs. In the third carboy I have a mixture which had gone through the phase I have just been speaking of; it contained some sugar with lactic ferment, but when all the sugar had disappeared, and was transformed into lactic acid, I left the carboy in the same warm chamber, and another fermentation has set in, and there is already a considerable quantity of the substance called butyric acid present, and the greater part, if not the whole, of the lactic acid has already passed over into this butyric acid. Here, in this glass dish, there is another ferment still, although, unfortunately, it has got disturbed in coming here. It contained a decoction of yeast, with which was put about 2 per cent. of pure

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* Cantor Lectures.

vinegar and about 4 per cent. of alcohol, and I then touched the surface of the liquid, which was perfectly clear, with a glass rod which had been in contact with the vinegar-plant, and left some little particles floating on the surface of the liquid. These little particles, in the course of a day or two, spread over the liquid, and when this vessel came from University College this morning it was covered with a perfectly uniform film, consisting of little cells different from each of the others to which I have called your attention, and quite distinguishable under the microscope. I should state that after the mixture was first made, and after the vinegar-cells were put into it and allowed to grow on it, I supplied them with some additional food twice. On one occasion I added a somewhat larger quantity of alcohol than was intended, and the effect was that the cells were most injuriously affected. They constituted a dense, smooth, white film, and this seemed almost to disappear, and on examination under the microscope it was found that they had shrunk—in fact, they had been killed by a too strong dose of alcohol. This was then allowed to evaporate, and the vinegar-cells very soon again spread over the liquid. I will now commence in another dish a similar experiment. I have in this bottle a mixture of yeast-water and alcoh.l, with a few drops of acetic acid in it. I will pour this into the glass dish, and then put on to the surface some of these little ferments which I have here, and I have no doubt that if we allow this mixture to stand we shall find by our next meeting that it will be covered over with a smooth film, consisting of vinegar-cells, which will be transforming the alcohol into acetic acid. I may show you the strength of the acid in this last instance by putting into it a slip of blue test-paper, which you see is immediately coloured a deep red.

With regard to the process by which these cells are propagated some exceedingly interesting experiments have been made under the microscope. Professor Mitscherlich and various others,—Pasteur among them,—have put little alcohol cells under the microscope, putting them first into a liquid upon which they could feed, and they have noticed that the cells, or some of them, gradually swelled out at one side,—that a little wart, if I may use the expression, made its appearance on one side; that this increased in size until it became as large as the original cell, and then it became detached. The propagation of the alcohol cells, the wine ferment, has been seen by several observers to take place by a process of budding. I will show you the growing cells, by throwing on the screen, by means of an oxy-hydrogen lantern, a photograph of the wine ferment, some of which will, I believe, show a little excrescence at the side, and the general arrangement of the cells will be easily detected. This is a photograph from a plate of M. Pasteur's, and conveys an exact representation of the appearance which the alcohol cells ordinarily present. I will now show you the photograph of the acetic ferments, and the difference in the general appearance is very striking. When examined carefully it will be found that these little vinegar cells are in couples, little masses about twice as long as they are broad, and by degrees they become strangulated at the waist, and ultimately separate. With a considerable magnifying power, it has been found that the wine cells contain granulated particles, but exceedingly little is yet known of their structure. Certainly one of the most promising directions for investigation in the phenomena of life is presented by the study of these various little organisms, which we have so completely under our control.

With regard to the processes by which these cells are propagated, I have mentioned already, that when certain liquids, capable of undergoing decomposition, are exposed to the air, some little cells gradually make their appearance in what was at first quite an unaccountable manner. It was long supposed, and on very good authority, that the oxygen of the air was the active agent in transforming a fermentable substance into these little cells; and Gay-Lussac, one of the ablest of French chemists, who died a short time ago, made some very careful experiments with a view to decide that point. They led him to the conclusion that oxygen was all that was needed in order to initiate the process of fermentation in the juice of grapes, which by itself does not ferment. It is worth while to state, in general terms, the nature of these experiments. He put into a glass vessel, closed by mercury, a small quantity of grape juice, which was expressed under mercury, so that it did not come in contact with air on its way into the glass jar intended to receive it. This was then kept closed for some time without change. He then introduced oxygen, sometimes from the atmosphere—I am now giving you an account partly of what was done by Gay-Lussac, and partly what was done by others—and sometimes the oxygen was derived from potassic chlorate. Air was used which had been passed through red-hot tubes, so that any vital organisms in it must have been destroyed before reaching the grape-juice; and it was found that, in these cases, the access of the air to the substance did induce the formation of yeast-cells, and did induce a process of alcoholic fermentation in the liquid by their growth. The conclusion, therefore, appeared to be established that oxygen was all that was needed for the process. Since that time, however, other experiments have been made, with precautions which were not observed by Gay-Lussac; and I must especially quote a truly masterly investigator, Pasteur, whose extraordinary researches in this subject have certainly constituted an important era in our knowledge of it. Pasteur has made a great number of experiments, partly such as those which had been made before, and partly fresh ones, of which I will describe a few characteristic samples. For instance, he took little glass bulbs, with a long neck bent in several places, like the one I hold in my hand. This little bulb contains some yeast-water, and also about 10 per cent. of sugar, a mixture which is peculiarly susceptible of undergoing fermentation and decompositions of various kinds. When this was introduced into such a bulb, Pasteur boiled the liquid for some time, so that any little living particles which might have entered the bulb with the liquid, by being exposed to the temperature of boiling water, might be killed, and also that any particles which might be lodged in the neck of the flask would be similarly treated and killed. Some of these bulbs he closed, sealing up the tubes whilst still full of steam, and he then put them by in a warm chamber, similar to that which I just now alluded to as being of the temperature of 30° Centigrade, so that they should be under the conditions most favourable to the development of any little living organisms, if such could develope themselves. He so kept them for days, weeks, and months, and I am not sure that he did not keep some for years, and at the end of the whole time he found that in no case was there the production of these vital organisms. I told you that when the tube was closed the vessel was full of steam; of course that steam was condensed on cooling, and left a partial vacuum above the liquid, and when Pasteur opened the tube by breaking off the point, the air rushed in violently to fill the vacant space. He found that in almost every case, although not in all, after this air had rushed in, a process of decomposition commenced, and in some cases he found little animalcules, and various kinds of mould in others, and he has described a considerable number of different organisms which he got in different bulbs in that manner. It so happened, also, that in one case the tube, I think accidentally, at first remained unsealed, that it was not kept from contact with the air as the others were; still, to his amazement, Pasteur found that even in this one which remained open there were no organisms, that it remained as unchanged as those which were sealed up. Finding this, he repeated the experiment many times, making a great number of bulbs similar to the first, putting some of that same liquid into them, and boiling the liquid for some time, so as to destroy any organisms; but, when they had been killed, he left the bulbs open, and he found that the contents were as effectually protected by the conditions there present as if the tubes had been sealed. He submitted the results to several members of the French Academy; the experiment was repeated by other persons, and the results showed—if there were any exceptions I do not remember hearing of them—that no organisms were produced. You will notice that the liquid which had been boiled was separated by a long, thin tube from the outer air, and the air only had access to it through this long, narrow, tortuous passage, which, moreover, was at first wet inside, because of the condensed steam. Pasteur then cut off some of the tubes, so as to allow free access of air to the contents, without having to pass through this long, narrow tube, and soon after that was done the process of decomposition set in, and he got various organisms formed in his mixture, which developed themselves in the way yeast, mould, and such-like organisms generally do.

(*To be continued.*)

Mortality from Snake-Poisoning.—The *Lancet* quoting a letter, dated the 11th August, from T. D. Beighton, Esq., of the Bengal Civil Service, magistrate of the subdivision of the Culna district of the Burduan province of Bengal, remarks, "The Culna district comprises, we presume, 80 or 100 square miles, and has a population of about 300,000. Mr. Beighton says that deaths from snake-bite are singularly common in the subdivision. An average of one per day is reported through the police. The actual deaths are probably double the number reported. If this daily average is meant to apply the whole year round, we should thus get, in a comparatively small district, the frightful result of 700 deaths from snake-bite. It is lamentable to think that, despite the supposed remedial discoveries in this direction, we still seem to be without an agent to neutralize the effects of the bites of poisonous snakes."

Disinfectants used in the International Society's Hospitals.—A correspondent of the *British Medical Journal* says, that in these hospitals the sick and wounded are most rigorously kept apart; the wounded on the lower, the sick on the higher floors of the hospitals. A space of 1500 cubic feet is allowed for each bed. Carbolic acid powder is strewed on the floors of the rooms twice a week. Chloride of lime or sulphate of iron is used for the privies. Chloride of zinc in solution is added to the water used for washing the bandages, sheets, and shirts of the wounded. The compresses, lint, etc., are put into a solution of carbolic acid, and afterwards poured out into a hole dug in the ground, and covered with earth. Sponges are used only to wash the patients, each of whom has a sponge for himself. The wounds are syringed with warm water, to which permanganate of potash is added. The lint and the compresses are moistened before being placed on the wounds, sometimes with carbolic acid solution, or with a mixture of carbolic acid and olive-oil.

Impure Acetic Acid.—Dr. Bruckner, of Philadelphia, reports in the *American Journal of Pharmacy*, that he has found acetic acid to contain phosphate of lime. This is a fact of importance in reference to the use of acetic acid in the analysis of phosphatic materials. The author suggests that the phosphate may have been derived from bone black, used for decolorizing the acid.

The following journals have been received:—The 'British Medical Journal,' Sept. 24; the 'Medical Times and Gazette,' Sept. 24; the 'Lancet,' Sept. 24; 'Nature,' Sept. 22; the 'Chemical News,' Sept. 23; 'Journal of the Society of Arts,' Sept. 23; 'Gardeners' Chronicle,' Sept. 24; the 'Grocer,' Sept. 24; the 'English Mechanic,' Sept. 23; the 'American Chemist.'

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

"FREE TRADE IN SURGICAL INSTRUMENTS."

Sir,—As discussion on the above subject appears to be invited, we, the undersigned chemists and druggists in Newbury, desire to express our entire concurrence in the opinions and statements of facts contained in Mr. Magg's letter of the 24th instant.

We consider that Messrs. Maw have not acted in a fair and generous spirit towards the trade, after the many years that their interests have been united; and by their present mode of doing business with surgeons, boards of guardians and others not connected with the profession in any way, and also by an indiscriminate distribution of their priced catalogue they are alienating their best friends, as they term chemists, though we doubt if the latter can conscientiously reciprocate the flattering compliment.

We are, yours faithfully,

PHILIP CHILDS, *Local Sec.*
HICKMAN AND SON.
DAVIS AND SON.
N. W. RYOTT.
F. G. HALL.
J. B. PRATT.
HENRY TAYLOR.
THO. W. AND B. FIELDER.

Newbury, September 26th, 1870.

Sir,—Several letters having appeared on this subject, perhaps you will kindly allow me a small space for remark.

I cannot join your correspondents in considering it a grievance that surgeons should prefer obtaining goods direct from the manufacturers and paying cash instead of encumbering the books of retail chemists with unprofitable, long-winded accounts. The fact alone is on the broad principle an advantage, tending to the improvement of trade in the aggregate.

As for supplying surgeons with any drug or other article, it is generally found unsatisfactory and unprofitable. I lately sold a general practitioner some Howard's citrate of iron and quinine, charging him 25 per cent. on the cost. He complained that the price was excessive, at the same time producing a drug list from a no less respectable firm than Messrs. Evans, Sons and Co., quoting a price considerably lower than I had given, but, while acknowledging that the preparation might be considerably better, said the low-priced drug "would answer his purpose."

An experience of more than thirty years assures me that no house is better disposed toward the legitimate retailer than that of Messrs. Maw, Son and Thompson, who do not supply articles to private customers, as is the known practice of several wholesale druggists and co-operative storekeepers, —a direct injury to retail trade for which there is no remedy. An instance occurred the other day which is more to the point than pages of complaints. A person applied to Messrs. Maw, Son and Thompson for an instrument, value one guinea, and in reply received the enclosed note:—

"Dear Sir,—We are in receipt of your favour of the 17th inst. We only supply the trade and medical profession, therefore must ask you to obtain the articles wanted through one of the chemists in your neighbourhood.

"We are, dear Sir,
"Very respectfully yours,
"S. MAW, SON AND THOMPSON."

(The following post brought me a credit note for 7*s*. commission on the sale.)

I hope it will be understood that my object in writing is not with a view to prolonging an unprofitable correspondence, but rather to express an opinion that the majority will endorse, namely, the right of every house of business, be it large or small, to conduct its own affairs in a manner most conducive to its own interests and to those of its supporters of every grade.

I am, Sir, (in haste) yours obediently,

DEPRECATOR.

THE BRIGHTON CHEMISTS' ASSOCIATION.

Sir,—Your correspondent "Veritas" is entitled to know that this Association was formed some years ago, and actively promoted by a few of the old members of the trade; but by reason of the apathy of the younger branches,—the meetings became stereotyped,—the same half-dozen gentlemen meeting month after month without any addition to their numbers; and, although the trade subscribed readily to meet current expenses, they failed by their absence to give the necessary impetus to secure success, the consequence was the meetings took place at longer intervals, and at last ceased altogether, until last month, when as there seemed a probability of the British Association visiting the town and with it the Pharmaceutical Conference, a meeting was called to consider the subject and to appoint another Secretary in the place of our much-esteemed friend Mr. Gwatkin, who resigned from ill-health. Mr. Julius Schweitzer was appointed Secretary, whilst our Mayor, Mr. Cox and myself were appointed to represent the trade (as duly convened by circular) at the Conference. The necessary qualification to become associated with the trade and an infusion of younger blood into the Association, are favourable circumstances to reinvigorate the institution, and as there is a fund to begin with, the *young men* should now avail themselves of the opportunity of arousing the latent energies of their compeers, and I am quite certain of this, that their older brethren will not shrink from any exertions to aid them. I am, Sir, yours,

W. D. SAVAGE.

DRUGGISTS' PRICES.

Sir,—The *Lancet* pursues a self-constituted censorship of pharmaceutical affairs. We are informed that "one great objection to practitioners handing over the dispensing of their medicines to chemists is to be found in the high prices charged by chemists for medicines," and also that "the dispensing of an ordinary prescription easily costs 2*s*. 6*d*. or 3*s*." Our profits are said to be "monstrously excessive." Let us look into the matter. In the first place, I may safely say that mixtures are more generally dispensed for 1*s*. 6*d*. and 1*s*. 8*d*. than for 1*s*. 8*d*. and 2*s*.; certainly for less in the provinces. A dozen doses of pills may be had for 6*d*. or 8*d*., and medicine enough for a fortnight at an outlay of 2*s*. 6*d*. to 3*s*. In saying that the chemist is "paid at once over the counter" the *Lancet* makes a random assertion. The generality of druggists do a large booking trade, and allow their customers to run accounts, not from choice but of necessity.

It appears that in one town the medical men gave up dispensing. Mark the effect of that act! The druggists have become familiar with prescriptions,—had they seen so little of those ungrammatical productions before?—and now they feel pulses, even those of affluent ladies, before the very eyes of the doctors themselves. What audacity, what effrontery! Here, indeed, is a heavy indictment; here the head and front of our offending. A doctor, finding himself forestalled by a druggist, who had told a lady that she had a weak pulse, evidently feels poignantly upon the subject, for he rushes into print, and declares that "this kind of thing must be put a stop to."

Here are two charges to meet. We are excessive in our charges, and we meddle with the practice of medicine. I say that our prices are not exorbitant, that they are perfectly legitimate, and in no way more than due return for our labour and time, especially in the face of the qualifications which are now to be required of those practising pharmacy. It is an egregious error to imagine that chemists will lower their charges to suit the fancy of the medical practitioner, so that he may obtain full remuneration, whilst the druggist is left to compound medicines at a maximum of trouble and a minimum of profit.

And as to prescribing, what is to be said? Are not the public their own masters? They come of their own accord to us for advice, they are perfectly aware of our status. They do not choose to call in a doctor for every minute ailment, every spasm or ache. We render them what service we can, and I think it may be truly said that we do not interfere with difficult and urgent cases. I have heard it frequently said that the doctor, once called in is, like some parasites, very difficult to get rid of; and I have known many who, after vainly hinting to their medical adviser that his persistent visits were superfluous, have been compelled to give him an outspoken dismissal. This is a reason why we are often consulted. We force physic down no one's throat.

It would be better for the *Lancet* to be a little less partial to its own order, for it might then discern medical shortcomings and abuses more clearly than it now appears to do. It has taken upon itself the unenviable task of attacking chemists and druggists, and in doing so has employed language and epithets of a most offensive character. We leave our case to the discrimination of the public in perfect confidence, assured that they will not cavil at a body of hard-working and painstaking men. Whether the *Lancet's* strictures have been composed in a fit of jealousy or hate I neither know nor care, but to the writer I may say,—

"Of your antipathy
If I am the Narcissus, you are free
To pine into a sound with hating me."

Yours truly

MINOR ASSOCIATE.

PHARMACISTS AND MEDICAL PRACTITIONERS.

Sir,—*Quelle horreur!* to think that a common, vulgar druggist should have the impudence to come "betwixt the wind and the nobility" of a medical man! Sit in the same room, forsooth, certainly not! We who, after heavily feeing a grinder, have passed with difficulty the "Hall," and subsequently received a diploma from the "College,"—shall the "elect" associate with the vulgar herd of pharmaceutists who have really passed a stringent examination? Never! The idea of a professional man, a gentleman, at a public exhibition coming in contact with a shopkeeper! Faugh! The smell of fœnugrec, cubebs, assafœtida would be overpowering. Really, it is too absurd to be entertained for a moment!

Malefactors! oh, the polish, the culture, the amenities of modern journalism! If the editor of the *Lancet* will refer to the police reports, he will soon discover who are the real malefactors. He may possibly find half-a-dozen unfortunate druggists who have caused death by accident or sheer carelessness, but he will find a vast number of cases where *bonâ fide* medical men have been found guilty of criminal practices. There is a wide difference between a druggist who causes the death of a child by selling its mother a pennyworth of Godfrey, and the man with a diploma, who devotes the chief part of his attention to a vile practice which eventually lands him in the hulks. There are very few of the former, unfortunately for society very many of the latter. Who is it that defile our newspapers by inserting disgusting advertisements? Medical men, who may have received diplomas in England, America, Germany, but still medical men. I am not aware that I ever saw a specimen of this obscenity with the name of a pharmaceutist attached.

If a child die by the carelessness of a druggist there is an inquest, and the druggist generally gets severely reprimanded by the coroner, if nothing worse; but how many mistakes are made by medical men which never come to light? In the latter case it is "hum! ha!" "unfavourable symptoms set in," "death," "certificate," "fee pocketed," and there it ends. Who, then, is the malefactor here?

Can the editor of the *Lancet* see nothing reprehensible in the "reciprocity treaties" now so much in vogue, where the physician compels his patient to go to a particular druggist, the two worthies subsequently dividing the spoil? Both are utterly despicable, but as the proposition invariably comes from the medical man he is therefore the most to blame. Confirmatory evidence of this is given in the current number of the journal in an advertisement emanating from an M.D.

According to the *Lancet*, then, a general practitioner (a fusion of doctor and druggist, forcibly reminding one of Barnum's celebrated mermaid, half monkey, half codfish) is a gentleman; but nevertheless he is not too much of a gentleman, not too proud, to take the bread out of the mouth of the poor druggist he so much despises, by retailing his medicines. Why does he, then, if he really be a professional man and a gentleman, play at keeping shop, dishonestly cheating the druggist out of the most profitable part of his business?

Would it not be better if the editor of the *Lancet* were to employ his literary talents in endeavouring to reclaim his erring brethren to the path of rectitude instead of casting aspersions on men who are in respect of education and position fully his equals, and who, as a class, not nearly so criminally-disposed as his own body? Yours obediently,

A COUNTRY M.P.S.

Sir,—"Non-Malefactor" appears little to understand his own interest or position, and still less that of medical men.

These latter must either be of service or the contrary; common consent will admit the necessity; if so, medical men deserve to be protected in their interest, otherwise there is little chance of the high standard being attained among us which "Non-Malefactor" seems to expect. It certainly will not mend matters for Pharmaceutical Chemists to do the work for us, —they are not educated for the purpose, so, to say the least, it is hardly honest on their part.

Both doctors and chemists must look forward to the day when their relative position and duties shall be defined by law, as is the case in many Continental countries.

September 20th. PERCY LESLIE, M.D.

Dear Sir,—In the *Lancet* of Saturday the 17th ult. appeared a somewhat more decent, temperate, and logical article on chemists than it has been accustomed to publish of late. The basis of the article is a letter from a correspondent with the appropriate signature of "Reformer," and he well deserves that title, since in the latter part of his communication he says, in reference to prescribing by chemists, "that this kind of thing should be put a stop to, for I can clearly see, as time advances, that it will get worse. Is it not possible, in this Medical Bill which will be again shortly before Parliament, to get a clause inserted to somewhat restrict this kind of thing? The only other remedy I can see will be for all general practitioners to supply their own medicines, as in former days (which certainly is rather *infra dig.*), and thus to wrench back from druggists that of which evidently they are depriving the profession." It would be quite as fair for druggists to agitate for a prohibition of doctors doing their own dispensing, as for chemists being prohibited from prescribing; and it seems nothing more than is to be expected, that as long as "the profession" dispense their own physic, so long will chemists do a little pulse-feeling, tongue-scrutinizing, counter-prescribing, which at least has been of some use to "the profession;" for "Reformer" says in the letter already quoted, "that in the town in which he resides he was one day greatly amused" (by the tenour of his letter he does not seem greatly amused, but possibly some time has passed, so the amusing effects have worn off) "at seeing the people, one after the other, come in to be doctored, the druggist actually in *my* presence feeling their pulses, etc." It certainly was not a pleasant sight for one of "the profession" to witness "people, one after another, come to be doctored," while his time and services were not in such great requisition; and then he and the other doctors of the town had generously given up dispensing their own physic, an act which I am sure you will coincide with me in saying deserved a better retaliation and which perhaps accounts for the rather bitter epistle of "Reformer."

But there must be something in the people flocking to the chemists and leaving the doctors. Is it on account of "the profession's" excessive charges or in their desire for keeping on with their patients, for both of these are complaints often urged against them by the people; or is it, as the *Lancet* says in the article referred to, that the price charged by druggists for dispensing doctors' prescriptions is high and of itself "a heavy and exhaustive bill to people in humble means, so that they can ill afford to pay the doctor's fee in addition. Mixtures they say are charged at the rate of 1*s.* 8*d.* to 2*s.* each, and other medicines correspondingly; so that the dispensing of an ordinary prescription easily amounts to 2*s.* 6*d.* or 3*s.*" This is really an immense amount to obtain for twenty minutes' work, and the drugs, chemicals, bottles and labels employed, and the risk of making a mistake, for which one might be mulcted in a penalty of £1000, as was Mr. Abraham; for when a mistake is made by chemists it is always found out and generally published, whereas if any mistake is made in writing in doctors' prescriptions, the chemists, as a body, are most scrupulous in keeping it from the knowledge of the patient and the public. And this amount, which in the majority of prescriptions, does not reach 2*s.*, is grudged by "the profession," after taking of the "person in humble means" a sovereign for a fee. Whether chemists, or even the people, see as "the profession" see, may be doubted. If the doctor dispensed his own physic, would the charge be much less than 1*s.* 8*d.* or 2*s.* for dispensing, or is not the doctor's usual price from 2*s.* 6*d.* to 3*s.* for the 8 oz. mixture of six doses, with other things in the same proportion? that is, nearly double what the *Lancet* calls heavy and exhaustive prices charged by the chemist to the "person in humble means." This price is not warranted by the extra skill used by the doctors in dispensing, seeing that the majority use ready-made mixtures and pills, which do for a large proportion of patients, and the dispensing is generally done by assistants whose pharmaceutical knowledge a very modified examination would "pluck." Nor is it the greater cost of the drugs employed, as those who supply dispensing members of "the profession" know, nor a more concentrated form, as those who take them know.

It would have looked much more becoming a learned profession if they had treated a newly State-recognized Society with some amount of generosity, and encouraged it in its laudable efforts to raise the standard of pharmaceutical education in the country, instead of throwing cold water on its well-meant, if at present weak efforts, or entering on a new crusade "to wrench back from the druggist" the small modicum of dispensing they have granted him. Apologizing for the length of this letter,

I remain, yours very obediently,

"AUDI ALTERAM PARTEM."

"IMPROVEMENT IN STOPPERED BOTTLES."

Sir,—Mr. Mayhew's letter in the Journal last week is a very sensible one; but I, however, also suggest that a small groove be made in the neck of the bottle to correspond with the groove at the top of the stopper, so as to keep the string in its place. There would be less danger of the string slipping from its position. Mr. Mayhew is an experienced man; I was a fellow-assistant with him in Cheltenham in 1838.

Louth, September 26th, 1870. JOHN HURST.

Thomas Day (Manchester).—Persons desiring to present themselves for the Minor and Major examinations must have passed the Preliminary examination, unless they, being twenty-one years of age, had been in business three years before the passing of the Pharmacy Act, 1868, and have also applied before 31st December, 1868, to be allowed to pass the Modified examination.

B. K. Earnshaw (Putney).—Yes.

"*Amor Justitiæ.*"—Such a person can be registered without examination upon making the statutory declaration, a form of which will be supplied by the Secretary on application.

"*Inquirer.*"—The Apothecaries' Hall certificate would be accepted by the Board of Examiners in lieu of the Preliminary Examination.

"*Inquisitive*" (Morecambe).—*Vide* 32 & 33 Vict. s. 1.

"*Spes*" writes, saying that in the Conspectus of the Examinations of the Pharmaceutical Society, for the Minor Examinations in Chemistry, the candidate is requested to give a description of the processes by which acids, oxides, salts, etc., of the Pharmacopœia are produced, and to state the composition of such as are *compound.* "Spes" would be greatly obliged if any of our correspondents would give one or more examples of the above compounds.

"*Quærens*" (Greenwich) (1) wishes to be informed what Oil of Kermes is. (2.) Tourmaline is the name of a group of double silicates, usually found in granite, gneiss or mica slate. The term artificial tourmalines has been applied to crystals of sulphate of iodoquinine on account of their optical properties. An article in which formulæ are given for the preparation of these crystals will be found in PHARM. JOURN., 1st ser., Vol. XIII. p. 449. (3.) Pimpernel water is distilled from the root. It is acrid, and of a blue colour.

Y. G. (Notting Hill.)—Sulphide of arsenic and unslaked lime are sometimes used for the purpose in combination with starch. Another method is to use a strong solution of sulphide of barium made into a paste with powdered starch.

"*Ink Pot.*"—(1.) Bloom of Roses is a solution of carmine in ammonia. You will find forms for its preparation in any work on cosmetics. (2.) PHARM. JOURN., 2nd ser., Vol. IX. p. 434. (4.) See the schedule to the "Petroleum Act," and numerous articles in the PHARMACEUTICAL JOURNAL. (5.) The rule for anonymous communications is that no notice can be taken of them.

G. H. H. will find a recipe for Glycerine and Lime Cream in PHARM. JOURN., 2nd ser., Vol. VIII. p. 679.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

THE PROCESS OF NUTRITION.

BY BARON LIEBIG.

Sensation and exertion are things fundamentally different, though it may be a long while before the physiological intellect succeeds in drawing a sharp distinction between them.

The plant is a magazine of sun-force which has been accumulated in its parts during their development, and this force stored up in the food material of animals is again manifested in the animal body; it is the manifold action of this force which comprises and determines all phenomena of animal life. Hence the elucidation of the laws obtaining in regard to that force should, above all things, engage the attention of investigators.

In a complex machine it constantly happens that interruptions of the work to be done are caused by the mere action of the mechanism itself: the driving bands stretch, or a screw gets loose, or there is a loss of power in consequence of friction between certain parts of the machine, and for this reason we find in large factories some one continually occupied either in finding out the causes of such impediments, or in providing a remedy for them according to the means at his disposal.

This case presents a very slender and scarcely accurate representation of the problems with which the physician and surgeon are jointly concerned in dealing with the infinitely more complicated human machine; but their ultimate object is in all cases that of maintaining this machine in regular work and in good condition, so that out of the power generated in the machine, there may be a maximum amount remaining available for the performance of intellectual and corporeal work.

I have already mentioned the very remarkable fact that in feeding a dog with a mixture of fat and meat (the latter being in larger amount than requisite for the animal's support), the excess of meat which is not accumulated in the body undergoes metamorphosis, its decomposition not being hindered by the fat given with it in the food.

This fact proves the existence of a cause which definitely limits the accumulation of those blood-constituents which are not applicable for increase of flesh, and it may be a question for the investigations of physiologists to decide whether this cause operates directly upon the colloidal albuminates of the blood, or whether its operation is restricted to those flesh-constituents which have passed into the circulation before assuming the colloidal condition. The opinion that the cause here referred to operates directly upon the albuminates of the blood, as such, can scarcely be reconciled with the phenomena observed during a state of hunger.

According to what we know respecting the processes going on in the muscles, urea is not a direct product from muscle-constituents within the muscle itself, and the question as to the origin of urea, or as to the part of the body in which it is formed, is still one of great interest.

Stokvis and Heynsius found urea in the liver of the mammalia, and they have expressed the opinion that it is formed in the liver from uric acid. Meissner has also established by a very comprehensive investigation the fact that urea does occur in the liver.

For appreciating the processes going on in the liver, which is in animals of the higher classes the most powerful apparatus in the whole body for splitting up material, it is essential to take into account the remarkable observation by Schmulewitsche* as to the formation of bile. Uric acid and the acids of the bile are nitrogenous compounds, and they must be regarded as derivatives of albumen; the same with regard to hippuric acid, creatin, glycocol, etc. Moreover, sugar is formed in the liver.

From the chemical point of view, which is alone to be considered here, a comparison of the composition of blood-albumen, the acids of bile and other nitrogenous products, leads to a recognition of some very interesting relations of these substances amongst each other, and to blood-albumen: as purely calculated relations they possess no real value, but they may nevertheless be of some utility in suggesting problems for investigation.

If to the formula which I have adopted for albumen of blood,† there be added 20 equivalents of oxygen, we obtain exactly the elements of 12 atoms of uric acid, 2 atoms of cholic acid, 1 atom choleic acid, and 14 atoms of water.

Blood-albumen . . .	$C_{216} H_{169} N_{27} S_2 O_{68}$
20 Oxygen	O_{20}
	$C_{216} H_{169} N_{27} S_2 O_{88}$
= 2 uric acid	$C_{60} H_{24} N_{24} O_{36}$
2 cholic acid	$C_{104} H_{86} N_2 O_{24}$
1 choleic acid	$C_{52} H_{45} N S_2 O_{14}$
14 water	$H_{14} O_{14}$
	$C_{216} H_{169} N_{27} S_2 O_{88}$

In like manner cholic acid contains the elements of hippuric acid, margaric acid, and a hydrate of carbon; by adding 2 equivalents of oxygen to 2 of choleic acid, we obtain the elements of cystin, cholesterin, margarin and carbolic acid.

By the association of 4 equivalents of water with cholic acid, there may be produced leucin, oleic acid and carbonic acid.

In 2 atoms of uric acid and 12 equivalents of water, there are the elements of 2 glycocol, 3 urea and 6 carbonic acid.

From 4 equivalents uric acid and 22 equivalents water, there might be produced 2 creatin, 5 urea and 14 carbonic acid.

There would be no object in multiplying these calculations, but I do not regard them as absolutely valueless, because a knowledge of *possible* relations of this kind awakens attention to those which are *actual*, and in that way it may contribute towards paving the way to a comprehension of normal and pathological processes. In connection with the foregoing formulæ the occurrence of cystin in the urine involuntarily calls to mind the formation of cholesterin and the reverse, while the occurrence of leucin suggests the formation of oleic acid.

In recent times several physiologists have occupied themselves with the question as to the origin of fat in the animal body.

Fat being non-nitrogenous, I believe that its formation must be in some way connected with the non-nitrogenous constituents of the food, though I do not dispute the possibility of its being produced from albuminates.

According to the investigations of Voit, it appears

* See *ante*, p. 143. † See *Chemical Letters*.

on the contrary to be tolerably well made out that fat is a product of the breaking up of albuminates, and Voit regards it as probable that the milk sugar in milk originates from the fat as the result of an oxidation, so that both fat and milk sugar would be derivatives of albuminates in the food.

But in my opinion the investigations conducted by Voit in reference to the origin of fat and milk sugar in the milk of cows, lead to entirely opposite conclusions, and it may not be uninteresting to examine somewhat closely the basis of his experiments and opinions.

The most important argument adduced by Voit in favour of the probable formation of fat from albuminates is based upon some experiments made, together with Pettenkofer, by which Voit believes he has proved that, in the body of a dog fed on meat, fat was formed from flesh, or might have been so formed.

Comparing the quantity of carbon in the meat-food taken, with the quantity given off as carbonic acid and in the other excretions, Voit found there was a deficiency of 3·8 grams carbon in the excretions, and, from considerations as to what may have become of that carbon, he is inclined to think that it was converted into fat and remained in that form in the body of the dog.

Although the deficiency of 3·8 grams is but small, Voit, nevertheless, does not think it can be due to experimental error.

Examining more closely the data employed in this calculation, it is, in the first place, noticeable that the daily excretion of urea varied between 100·41 and 115·02 grams, while the fæcal excretion also varied between 18·1 and 53·6 grams.

The quantity of carbon in the urine was calculated from the mean of ten experiments; the quantity in the fæces from the mean of seven experiments; but on the other hand, only three respiration experiments were taken into account for the determination of the carbon in the expired carbonic acid.

It appears to me that this circumstance involves an error, though it may be a small one, inasmuch as a correct balance could be expected only when the determination of the carbon eliminated in the urine and fæces referred to the same day on which the carbon in the expired carbonic acid was determined; but on that day the dog did not pass any fæces, so that the numbers given could only represent estimated quantities, and though they are astonishingly accurate when not differing more than 3·8 grams in the carbon, they are not absolutely accurate, nor would any one acquainted with experiments of this kind regard them as sufficiently accurate to serve as a basis for a theory of fat production.

But even if the accuracy of the deficit be not disputed, there is a further reason for refusing to attach any weight to Voit's inference that the 3·8 grams of carbon wanting in the excretions had been converted into fat, because he forgot that the meat on which he fed the dog contained some portion of fat. In his previous experiments with Bischoff, he says, "the meat was good fresh cow-beef, always *very carefully* deprived of fat, bones, etc. Several analyses showed that it contained at the utmost only 1 per cent. of fat."*

I have myself determined the fat in a piece of very lean beef that had been selected by Professor Bischoff for this purpose, and, by dissolving the meat with hydrochloric acid, I obtained ⅓ per cent. fat.

Then considering that in the experiments made by Voit and Pettenkofer, the dog was fed daily with 1500 grams of meat, and assuming this to contain ⅓ per cent. of fat, the dog would receive 5 grams of fat daily in the meat; moreover, if there was really, as observed, a deficiency of 3·8 grams carbon, corresponding exactly to 5 grams of fat, it is infinitely more probable that this quantity of fat, taken in the food, had simply remained in the dog's body, than is the assumption that this 5 grams of fat was consumed in the respiration, while another 5 grams was produced out of the albuminates of the meat. Such an assumption is indeed incompatible with the economic laws of the animal body.

Besides this, Voit did not take into account the fact that in his earlier experiments together with Bischoff,* a dog fed with 1800 grams of meat (or 300 grams more than in the case above referred to) lost, within seven days, 230 grams, or nearly half a pound of body-weight.

This fact is as little in favour of the production of fat from flesh, as the more recent experiments. It may indeed be said that the loss of weight in an animal fed with meat does not at all disprove the production of fat from flesh, since the fat must displace a certain quantity of water, and thus give rise to loss of weight; but such an objection as this would not have any significance, unless the production of fat from flesh were indubitably proved, and that is not the case.

In Voit's investigation there is the same kind of error that Pasteur committed when, from the loss in his determination of the ammonia in fermented liquors, he inferred a positive fact, without knowing the source of that loss—thus adopting a procedure inadmissible in scientific investigation.

As may be gathered from what has already been said, Voit's experiments with the dog cannot any longer be admitted as arguments in the question as to the production of fat.

In regard to Voit's experiments with the milch cow, his exposition of them, just as in Thomson's investigations, is based upon the erroneous idea that a diet rich in albuminates exercises an influence on the production of butter, and increases the quantity of it, while existing experience only goes to show that a *strong diet* (Kraftfutter) increases the *yield of milk*.

The experiments made in this direction by Kühn show that the composition of cow's milk is very constant with different animals and kinds of food; milk varies in the amount of water, but during long periods of observation there is scarcely any alteration in the relative proportions of its constituents. "The greatest differences were observed in the fat, next to those in sugar. On the average of all the animals this amounted to 0·09 per cent. in favour of food that was itself superior to the extent of about 17 or 18 per cent." This is a remarkably small difference.†

It is evident that it would only then be possible to speak of any influence of albuminates upon the yield of butter if, on the addition of albuminates to the fodder, the amount of butter in milk were sensibly and permanently augmented; however, observation shows nothing beyond the fact that the yield of milk

* 'Die Gesetze der Ernährung des Fleischfressers,' p. 56.

* *Ibid.*, p. 79.

† Landwirth. Versuchs-Station, Dr. Nobbe, 1869, xii. 154.

is increased by adding meal to the ordinary hay fodder.

The conclusion at which Voit arrives is the following. He says, "As regards the main question, it appears that, on the whole, the cow took up into the circulation from the fodder, 1658 grams of fat, or four-fifths of the fat contained in the milk; the 562·35 grams nitrogen in the urine corresponds to 3602 grams albumen, which, according to our views, yields 1851 grams fat (100 albumen = 51 fat)."

"Therefore, we have in all 3509 grams fat available from the food and the albumen. However, the milk contained only 2024 grams of fat, so that there remains over and above that 1485 grams fat, which is nearly sufficient for the formation of the milk sugar in such a manner that, in the foregoing case at least, there is no necessity for having recourse to the hydrates of carbon for the wanting fifth of the fat, or probably for the milk sugar either."

This calculation is as clear as possibly can be; all the albumen of the fodder passing into the circulation is supposed to be converted, in the body of the cow, into casein, urea and fat; any deficiency of fat in the milk is made up by albumen, and whatever fat remains over is converted into milk sugar.

But in regard to the validity of this calculation, there are very important objections.

It is, in the first place, a thoroughly well-established fact that, for keeping up a given condition, an animal requires a certain quantity of albuminates and non-nitrogenous substances for the performance of its internal work; the nitrogen of the albuminates is eliminated in the urine and fæces, in the former as urea and hippuric acid, etc.

A cow producing milk requires a larger quantity of fodder than a working ox, and the fodder must contain the same proportion of albuminates as in the latter case,—for 100 pounds live weight 0·23 pounds albuminates, and from 1·25 to 1·4 pounds non-nitrogenous substances, according to Settegast. In both animals the quantity of nitrogen taken up is the same; in the cow, a part of the nitrogen passes into the milk as casein, and the remainder into the urine and fæces. Deducting from the nitrogen in the urine of the ox that quantity of nitrogen which is contained in the milk of the cow, the remaining nitrogen in the urine of both animals will be the same. The weight of both animals remains unaltered, and it is clear that the albuminate which becomes casein in the cow is expended for work in the body of the ox. On the whole, the secreted quantity of nitrogen is the same in both cases, but the quantity in the urine of the ox is larger than in that of the cow.

Consequently, if *all* the albumen corresponding to the nitrogen in the urine were, as Voit thinks, together with the fat from the fodder, converted into urea and milk in the body of the cow, much as corn is converted in a mill into bran and meal, there would not be any albumen left for the vital economy of the animal. This leads obviously to the assumption that the cow had lived solely at the cost of the non-nitrogenous constituents of the fodder, and had thereby performed its internal work.

But, assuming on the contrary that the albumen corresponding to the nitrogen in the urine has served for internal work and for replacing material eliminated from the body by metamorphosis, it would then follow that the products of this metamorphosis had been applied for the production of milk, and that 85 per cent. of these products consisted of urea and fat.

Then, if we seek for the reasons by which, regardless of all that we know as to the products of metamorphosis in the animal body, we are to be induced to regard such conclusions as valid, we find them thus stated by Voit:—*

"Since I do not at present know any better, I take it for granted that from 100 albumen there are produced 33·5 urea and 51·4 fat."

This is, indeed, the actual basis of Voit's theory respecting the production of milk, a purely supposititious breaking up of albumen into fat and urea in proportions that suit his calculation, adopted solely to serve, in the absence of facts, as the foundation for an imaginary explanation. Consistent with this is Voit's procedure in dealing with ascertained facts concerning the production of milk, so as to make them agree with his views; in his hands, such facts are like wax, to which the wished-for form is given by kneading it.

In scientific investigation such a mode of proceeding does not convince any one; it is always a sign that facts are wanting which would speak for themselves.

After all the laborious work and all the multiplicity of analyses that have been made, we are not one step further advanced in our knowledge as to the origin of fat and milk-sugar in the milk of the cow; and, as I believe, the reason of this is, that the question has not been properly stated. Let us only suppose that Voit had in his experiments selected another cow,—one that gave little milk instead of one that gave much; it is highly probable that his calculation would then have come out still more favourably for his theory than was actually the case; it might have happened that the quantity of urea excreted by this cow should have been just as large as in the experimental case, and then by calculating the urea as albumen, there would have been enough of this substance available for the production of *all* the constituents of the smaller quantity of milk, the casein, the fat and the milk-sugar together, and, in such a case, it would not have been at all necessary to regard the fat of the fodder as taking part in the production of milk. It must be evident that as Voit puts the question at issue, its decision would, in any case, have been in favour of his preconceived view; the more unfavourable the conditions, the better would the calculation have suited.

In the treatment of physiological problems there is only too often an opportunity of observing the absence of that strict method which does not permit of data being applied for drawing conclusions before their sufficiency for this purpose has been fully established; thus, for instance, Voit calculates the nitrogen in the urine of his experimental cow as albumen, although he knows that a considerable portion of that nitrogen belongs not to urea, but to hippuric acid, which contains, relatively to nitrogen, eighteen times as much carbon, which then figures in the calculation as fat. In doing this, Voit relies upon Meissner, who thinks himself justified in concluding from his experiments that the non-nitrogenous product of hippuric acid must be derived from non-nitrogenous constituents of the food. However, the facts ascertained by Meissner are susceptible of an entirely different elucidation, and, in particular, we know that benzoic acid as well as bitter-almond oil,

* *Op. cit.* p. 116.

are constant products of the oxidation of albuminates.

The production of benzoic acid from the non-nitrogenous constituents of hay appears to me much more difficult to explain than the production of margaric acid from hydrates of carbon; still these are things that are in no way connected with the question here under consideration.

Our experience in reference to the chemistry of fermentation teaches us that from sugar, alcohols may be produced, which have many characters in common with the fats; and there is little reason for regarding as inappropriate the opinion that in organic processes alcohols of a higher order may be produced from non-nitrogenous substances, or that from those alcohols the corresponding acids may originate. It is sufficiently well known that butyric acid may be produced from lactic acid.

Quite recently it has been asserted that by the aid of the microscope, the conversion of the plasma of the cells into fat in the lacteal glands may be observed, inasmuch as its breaking up is accompanied by the appearance of fat in the form of milk corpuscles. But independently of the fact that we cannot actually see such a transformation of the constituents of cells, and indeed only perceive one thing in the place of another, Voit's experiments appear to me in this respect unfavourable to the idea of a conversion of nitrogenous constituents of the lacteal glands into fat, since he is compelled to adopt the assumption that at least four-fifths of the fat in cow's milk must have been furnished by the fodder.

The fat in milk contains, as is well known, several glycerine compounds of volatile acids,—butyric, caprylic, and caproic acids, which may very well be derived either from ordinary sugar or from milk sugar.

The question as to the production of fat does not appear to me to be susceptible of determination by experiments with herbivorous animals: what we do know with certainty is that in the case of these animals, albuminates and hydrates of carbon must act together, in order to produce fat; but we do not know at all whether the non-nitrogenous product that becomes fat originates from albumen or from hydrate of carbon, and I do not think it would easily be possible to ascertain this with certainty.

In researches of this kind I believe it to be necessary to take into account the nature of the animal, and that we should not, without good reason, assume the processes taking place in an herbivorous animal to be the same as those going on in the body of a carnivorous animal.

There is a large number of observations which appear to prove that in certain pathological processes fat originates from nitrogenous tissues, and therefore I regard it as probable that in the bodies of carnivorous mammalia albumen is concerned in the formation of fat and milk sugar, perhaps also under some conditions in the bodies of herbivorous animals. At least there are no chemical reasons that are opposed to such a view.

I have already mentioned that cholic acid, a product of the splitting up of albumen, contains exactly the elements of hippuric acid, margaric acid, and a hydrate of carbon:—

$$\underset{\text{Cholic acid.}}{C_{52}H_{43}NO_{12}} = \underset{\text{Hippuric acid.}}{C_{18}H_{9}NO_{6}} + \underset{\text{Margaric acid.}}{C_{32}H_{32}O_{4}} + \underset{\text{Hydrate of carbon.}}{C_{2}H_{2}O_{2}}$$

And in like manner glycocol, another product of the splitting up of albumen, contains the elements of urea and sugar:—

$$\underset{\text{2 Glycocol.}}{C_{8}H_{10}N_{2}O_{8}} = \underset{\text{Urea.}}{C_{2}H_{4}N_{2}O_{2}} + \underset{\text{Sugar.}}{C_{6}H_{6}O_{6}}.$$

Chemically, therefore, we may regard as possible the production of milk sugar and of a part of the fat in milk of carnivorous mammalia, from albumen.

The formation of hippuric acid from benzoic acid in the bodies of animals demonstrates the existence of glycocol, and its presence admits of the belief that this substance serves certain purposes in the organism.

The fact that, in the case of men fed on a diet consisting chiefly of meat, there is a reduction of the amount of fat in the body, is in no way opposed to the opinion that fat may be produced from albuminates.

To explain this fact it has been assumed that, owing to an excess of albuminous substances in the food, there is an increase in the number of blood-corpuscles and that, thereby, the absorption of oxygen by the blood is augmented, so that the oxidation within the body, especially of fat, is increased; but the absorption of oxygen is solely dependent upon the rapidity with which air and blood come in contact within the organs of respiration; in the higher animals it stands in proportion to the number of the heart's pulsations and of the inspirations within a given time; it is not even dependent upon the amount of oxygen in the respired air.

In compressed air the number of inspirations is diminished; in expanded air the number of inspirations is increased; while in both cases the quantities of expired carbonic acid, and the temperatures, vary only within narrow limits. In the ascent of Mont Blanc, Lordet observed that, from Chamouni up to the summit, the pulsations of his heart increased from 80 to 136, while the temperature decreased during the ascent, but after resting at the same height it remained constant at 36·5° C.

The diminution of the fat accumulated in the body when the diet contains a preponderance of meat is readily explicable from the slight respiratory value of meat as compared with fat and the hydrates of carbon.

A dog weighing 34 kilograms requires for the maintenance of its weight a daily supply of 3 pounds or 1500 grams of meat; and it is intelligible that a man weighing twice as much (for whom it would be almost impossible that he should consume, with a little bread, 3 pounds of meat daily) would not find this diet sufficient for the requirements of respiration. According to Voit, a working man consumes daily, for instance, under normal conditions of diet 137 grams of albuminates = 549 grams meat; also 117 grams fat, and 352 grams hydrates of carbon. Therefore, deducting from the 1500 grams of meat the above 549 grams, there remains for replacing the fat and starch 951 grams of meat, which would barely suffice to make up for the starch (97·2 parts starch = 309·7 parts meat); and even assuming that a man had consumed 1500 grams of meat, it is evident his body must furnish the 117 grams of fat that would be deficient. This sufficiently accounts for his becoming lean.

In all the processes of the animal body,—in digestion, formation of blood, respiration and metamorphosis,—some part is taken by those inorganic constituents, or salts, which are constant constituents of the blood, muscles, tissues, as well as of all organs, and, in the latter form, of the food. Sometimes the part they take is very decided; it is only by their aid that the nutritive substances in the food of man, and in the fodder of animals, acquire the capability of serving for the maintenance of organic processes and, consequently, these salts should always be taken into account in the explanation of those processes.

However, the length to which these papers have now extended precludes any more detailed consideration of the chemical relations of salts to the organic processes for the present, and I must reserve this subject for a future opportunity.—*Proceedings of the Roy. Bavarian Academy of Sciences*, 1869, ii. 4.

PREPARATION OF CANTHARIDATE OF POTASH.

The following directions are given by MM. Delpech and Guicard:—Dissolve with a gentle heat 2 grams of cantharidine in 150 grams of alcohol; add 1·6 grams caustic potash dissolved in a little distilled water. The liquid immediately assumes the form of magma, and the alcohol is to be separated by filtration and pressure. Ninety-eight parts of cantharidine give 163 parts cantharidate.

To prepare vesicating taffetas, make a solution consisting of gelatin 2 parts, water 10 parts, alcohol 10 parts, cantharidate of potash 0·2 part, and glycerine as much as may be required. This mixture is to be spread over thin sheets of gutta-percha with a brush, so that each square decimetre may contain one centigram of cantharidate. These taffetas must be moistened with water before being applied. Vesication will be produced in about six hours.—*Journ. de Pharm. et de Chim.*

THE PRODUCTION OF IODINE AND BROMINE.

BY W. H. CHANDLER.

To Scheele the world is indebted for the first intimation of the elementary existence of fluorine and chlorine, he having in 1771 referred the action of sulphuric acid upon fluor-spar to the freeing of a distinct acid from the mineral, though whether fluorine has, even up to the present day, been isolated, is a matter of great doubt. In 1774 the same chemist isolated chlorine. In 1811 Courtois separated iodine from the waste liquor in the manufacture of soda ash from seaweed. This was followed by the discovery of bromine in the bittern of sea-water by Balard in 1826. The isolation of these four closely-allied elements from their compounds was thus included in a century, and the application of them to economical purposes, to any extent, has been accomplished since the beginning of the present century. Their close relationship, their physical properties and their chemical affinities, which are nearly in an inverse proportion to their chemical equivalents, induce the supposition that they are modifications of the same element.

The isolation of chlorine, bromine and iodine from their compounds with the alkalies, is accomplished with equal facility. But the abundant store of the former in the enormous deposits of salt throughout the world and in solution in the ocean and inland seas, forms a striking contrast to the rarity of the two latter halogens. In combination with silver, bromine and iodine are found in some rare ores in Mexico and South America. Chatin claims to have detected iodine in rain-water, though in very minute quantities, and even in the atmosphere. In sea-water traces of it have been uniformly detected though not in quantities sufficient for quantitative estimation. Bromine exists in slightly larger quantities and, associated with iodine and chlorine, is found in the water of the ocean and inland seas, the various mineral and saline springs and in salt deposits throughout the world.

According to Von Bibra, the amount of bromine in the Atlantic Ocean, in one United States gallon, is 24 grains; in the Dead Sea, examined by Herapath, 121·5 grains; in the dried residue of the Mediterranean, 1·15 per cent.; in the mineral springs of Kreutznach, Ure found 10·8 grains; in Kissingen water, determined by Kastner, 0·44 grains; at Tenbury, in Worcestershire, examined by Dr. Ure, as much as 12·5 grains; and at Arnstadt, according to Hartung, 13·6 grains. Iodine occurs in far less quantities, from mere traces to 2·2 grains per gallon, this latter quantity being found in the iodine spring at Halle.

In the United States, both bromine and iodine have been detected in the various saline and mineral springs. Iodine was first detected in this country, in the Saratoga Spring waters, by Drs. Usher and Steel, in 1830, and bromine in the same waters by Dr. A. A. Hayes, and in the salines of Onondaga by Professor B. Silliman, in the same year. The quantity of bromine in the spring waters of Saratoga county, determined by Professor Chandler, reaches 3·63 grains per gallon in the water of one of the artesian wells, the largest amount of iodine found being 0·2 grain; but in America, as in Europe, it is in the salines that the quantity of these substances becomes of economical importance, and in a brine of the Saginaw valley, Dr. Chilton found 7·65 grains of bromine; at Tarentum, Pa., 6 grains bromine and 4 grains iodine were reported by Stieren; in the Salina brine analysed by Professor Goessmann, however, only 1·36 grains of bromine per gallon are reported.

Besides these various sources, iodine has been detected in the soda deposits of Peru, in the ashes of sponges, and in the ashes of the Spanish barilla plants. Cod-liver oil is said to owe some of its medicinal properties to a trace of iodine. Though the distribution of bromine and iodine is thus very general, yet owing to their existence in such comparatively minute quantities, the sources of our commercial supply are much more restricted.

Up to the beginning of this century the alkalies of commerce were derived from the ashes of plants, and the burning of sea-weeds was an important industry, especially in Great Britain and Ireland.

The amount of ashes of sea-weed, the so-called kelp, reached its maximum production in 1800, when 20,000 tons were collected. To produce this, 400,000 tons of wet weed were burned. From this time, owing to the removal of the import duty and to the introduction of the manufacture of soda-ash from common salt, the trade declined. But the discovery of iodine in the mother-liquors of kelp salts, somewhat revived the manufacture,—and it is to this source alone that the total supply of iodine in commerce is due. The high price stimulated the business, and, in a few places in New England, iodine factories were established. These latter, however, were soon abandoned, the weed upon our coast being of poor quality. The process of separating the iodine is exceedingly simple, being nearly analogous to that for the isolation of chlorine. The ashes are leached with water, and the various crystallizable salts of potash and soda are separated by concentration. Carbonates, sulphates and chlorides of potash and soda are thus removed, leaving in solution, sulphite, hyposulphite and some carbonate of soda, together with the iodides and bromides. By the addition of sulphuric acid the first three salts are decomposed, and the sulphate of soda produced is removed by crystallization. The concentrated mother-liquor is acidulated with sulphuric acid, and after the addition of binoxide of manganese, the iodine and bromine distilled off. The reaction may be represented thus:—

$$NaI + MnO_2 + 2(HO,SO_3)$$
$$= NaO,SO_3 + MnO,SO_3 + 2HO + I.$$

The bromine of commerce was derived mostly from salines until the salt mines of Stassfurt were opened; the Schoenebeck salt springs, near Magdeburg, producing the greater part of the supply for Germany. The method of manufacture is similar to that followed in the separation of iodine.

Upon opening the mines of Stassfurt, bromine was found in the mother-liquors in considerable quantities, and at present the principal part of the European product is derived from this source; as much as 300 grains per gallon having been obtained from these mother-liquors. Although but two or three of the manufactories have economized this substance, the price of bromine has greatly decreased during the last five years. This decrease has been hastened by the large production of bromine in the United States.

Although the amount of bromides in the Saratoga waters is considerable, yet the comparatively limited flow of water there, and the large consumption of the waters for medicinal purposes, precludes the manufacture. But from the strong salines it is derived in large quantities. At Tarentum, Sligo and Natrona, in Western Pennsylvania, Pomeroy, Ohio and Kanawha, West Virginia, the manufacture of bromine has become of considerable importance. The production of 1870 will reach 125,000 lb., a quantity probably in excess of the United States consumption. In 1867 the Stassfurt production of bromine was nearly 20,000 lb.

The total production of iodine in Great Britain and France is about 200,000 lb. annually, and outside these two countries very little is produced. As the average production of iodine is about 10 lb. to the ton of kelp, and it requires 20 tons of wet weed to produce one ton of kelp, this total quantity represents the burning of 400,000 tons of sea-weed. At the present price, the iodine produced is of more value than the alkaline salts, which were the original object of the industry.

As previously stated, iodine is not produced in the United States. Since its use was first established there the price has fallen from \$16·00 to about \$5·00 per lb. At present, bromine is furnished for less than \$1·50 per lb.

The chief consumption of bromine and iodine is for medicinal purposes in the form of iodides and bromides of potash, soda, or ammonium. A small proportion is consumed in photography. Bromine has been proposed as a discharge in calico printing, and during the late war was to some extent employed as a disinfectant. As yet, but a small proportion of the bromine of the saline mother-liquors is economized; but should manufacturers turn their attention to this important substance, the consequent reduction in price would render its economical employment in other directions possible.—*Amer. Chemist.*

MISTURA CRETÆ.

In the *American Journal of Pharmacy*, Mr. H. P. Reynolds, of Plainfield, New Jersey, recommends the following formula for mistura cretae, which, he says, will yield a mixture that does not ferment in the warmest weather:—

℞ Cretæ Præp.,
Pulv. Gum. Acac.,
Glycerinæ (pur.), āā ℥j
Aquæ Cinnamomi ℥xv

Mix in the usual manner.

With the same object, Mr. W. Ranstead, of Mount Airy, Philadelphi, prepares a powder as follows:—

Cretæ Præp. ℥ss
Pulv. Sacch. Alb.,
Pulv. Gum. Acac. āā ʒij

Mix well by rubbing in a mortar, and keep well stopped from the air in a bottle.

When the chalk mixture is needed he uses ʒj of the powder with f℥ss each of water and cinnamon water for each f℥ required.

It is also suggested by Mr. Reynolds that in the next revision of the United States Pharmacopœia glycerine should be substituted for syrup and sugar in very many of the official preparations. He says, "Glycerine preparations, made by cold percolation direct from the crude drugs, may advantageously take the place of nearly all the present official syrups, possessing, if desired, the same density, better representing their respective bases, and being of a far more stable character. Of this I am satisfied by actual experiment."

Suicide by Poisoning.—On Tuesday, September 17th, an inquest was held by Dr. Lankester upon the body of Mr. Walter Killick, twenty-one years of age, lately a clerk in a mercantile house. It appeared that the deceased having shown signs of mental aberration, his friends had taken steps to place him in a lunatic asylum. It is probable that he heard of this design, for he suddenly left his friends in the country, and came up to town. After partaking of refreshment at an hotel, he retired to rest. The next morning, as he made no appearance, his room was entered, and he was found lying on the bed quite dead. There were bottles about the room which had contained chloroform, beetle poison and laudanum. The laudanum, it was shown, was purchased at the shop of Mr. Mason, chemist, Old Street, St. Luke's, Mr. Mason's daughter, a girl only fourteen years of age, selling it. The deceased had represented that he was a surgeon, and wanted the poison to destroy a dog. The jury returned a verdict "That the deceased committed suicide while in an unsound state of mind," coupling with it a reflection upon Mr. Mason for permitting a child to vend poisons.

Death under the Influence of Chloroform.—A few days since, a man thirty-four years of age received a severe wound on the finger from the kick of a horse. He was admitted into the Royal Free Hospital the following evening with symptoms of tetanus. The next day, it having been decided to amputate the finger, chloroform was administered on a piece of lint. After two or three inhalations the patient struggled violently, and shortly afterwards expired. At the inquest which was held, a verdict of "Death from tetanus, accelerated by chloroform," was recorded.

Poisoning by the Leaves of the Yew.—*L'Imparziale*, of Florence, mentions the case of a girl who took a decoction of the leaves of the *Taxus baccata* to bring on catamenia. She repeated the dose every morning for three days, but on the fourth she took an increased dose of eight ounces. Severe vomiting ensued, a medical man was called in, and the vomiting was encouraged by the use of tepid water. In spite of every effort, however, the patient died delirious, eight hours after taking the last dose of the decoction. Nothing of importance was revealed by a post-mortem examination.

Poisoning by Locock's Pulmonic Wafers.—It is reported that a child has recently been killed at Kilmarnock by swallowing some of Locock's pulmonic wafers. Medical help was obtained, but it was of no avail, the child dying in twelve hours. The basis of these wafers is probably some form of opiate, but the public are not generally aware that they are so dangerous as this case would seem to prove them to be.—*Medical Times and Gazette.*

Adulterated Beeswax.—Dr. Hager has met with a substance, sold in the Continental market as beeswax, which consists of equal parts of beeswax, paraffin and Japan wax.—*Pharm. Cent. Halle.*

Radway's Ready Relief.—According to Dr. Hager, this nostrum is an alcoholic solution of camphor, oleoresin of capsicum, and ammonia.—*Pharm. Cent. Halle.*

The Pharmaceutical Journal.

SATURDAY, OCTOBER 8, 1870.

METROPOLITAN LABORATORIES.

The Pharmaceutical Society no longer stands almost alone in having, as a part of its educational department, a chemical laboratory for students which would bear comparison with the laboratories of the Continent. Other institutions have long since seen the value of this means of study, and, recognizing the special necessity for practical work in the study of chemistry, they have applied their resources in the establishment of suitable laboratories.

In the matter of chemical laboratories, however, we are yet shockingly behind Germany. Still we are improving. At St. Bartholomew's there is the fine new laboratory, presided over by Dr. MATTHIESSEN. The Charing Cross Hospital has also recently enlarged its laboratory. But the laboratory of the Pharmaceutical Society will still bear advantageous comparison with those of other metropolitan institutions, and the attendance of students at it seems to show that its beneficial assistance is well appreciated.

Since last Session considerable changes have taken place in the chemical lectures at the medical schools. At Guy's Hospital, in the room of Dr. TAYLOR, there is Dr. DEBUS. King's College, as our readers will perceive, has just lost Dr. MILLER.

St. Thomas's, on the other hand, which was to have removed to its new quarters, opposite the Houses of Parliament, is still in its temporary lodgings in the Surrey Zoological Gardens.

Probably before long we may have provincial laboratories in no way inferior to those in London.

In a recent article upon the Art of Prescribing, the *Lancet* expresses an opinion that, as understood by our fathers, it is certainly dying out if not already dead. Prescriptions are simplified, and single drugs are often given, but the teachers of the present day err in paying no attention to the instruction of their pupils in the art of writing such prescriptions as would be given to a private patient to be compounded by an ordinary druggist. Time may be saved in hospital practice by using formulæ for mixtures and pills, or referring to their number in the hospital Pharmacopœia, but by so doing the student misses teaching to which he is fairly entitled.

It also points out that although there is a general consent that the "directions" should be in the vernacular, but the drugs and their quantities in Latin, —teachers seldom dictate the drugs in Latin, much less the quantities; and asserts that if an ordinary abbreviated prescription were put into the hands of many advanced pupils, they could not put it into Latin without committing various solecisms.

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

The following contributions have been received since the publication of our last:—

	£.	s.	d.
J. B. Bailey, Reading	1	0	0
John Mitchell, 254, Upper Street, N.	1	1	0
J. Smart, Scarborough	1	0	0

Collections per Michael Rogerson, Local Secretary at Bradford, Yorks:—

	£.	s.	d.
M. Rogerson and Son	5	0	0
Joseph Hick	2	2	0
Harrison and Parkinson	5	0	0
John Boast	1	0	0
William Cockshott	1	0	0
John Walker	0	5	0
William Newsholme	0	10	0
John Tankard	0	5	0
James Foster	0	5	0
James Roper	0	4	0
Joseph Cookson	0	2	6
Samuel Parker	0	2	6
Samuel Beanland	0	5	0
J. Rhodes	0	5	0
John Priestley	0	1	6
	£16	7	6

	£.	s.	d.
T. Ackerman, Bristol	1	1	0

3 oz. bottles of sulphate of quinine.

Edward Constance, 37, Leadenhall Street.
1 doz. 2 oz. liq. opii sedat.
½ ,, 2 ,, cinchon. cordifol.

J. Bell and Co., Hastings.
2 lb. methylated chloroform.
4 oz. chloral.
4 lb. lint.

Charles Jones, Hanley.
6 gross 1 gr. opium pills, in bottles of 4 doz. each.
6 ,, 2 ,, quinine pills ,, ,,
6 ,, ¼ ,, morphia pills ,, ,,
3 lb. lint.

R. H. Davis, Harrogate.
400 pil. opii, gr. i, in bottles of 50 each.
400 pil. morphiæ acet., gr. ¼, ditto.
1 oz. muriate cinchonine.
4 ,, pot ext. carnis.
1 lb. chocolate powder.
1 ,, arrowroot.
2 woven vests.
4 bandages.

S. A. Keyworth, Hastings.
2 ½-lb. bottles pure carbolic acid.
2 lb. lint.

The following letter has been received in reference to this Fund:—

Dear Sir,—Will you kindly allow an explanation in reference to the Chemists and Druggists' Fund for the Sick and Wounded?

It ought to be known that our esteemed friend Mr. Alderman Gould, J.P., of Kingston, among many other places visited Richmond, and by his disinterested exertions succeeded in arranging two public meetings, at which he delivered interesting and stirring addresses; a committee was formed, and the chemists on being called upon liberally responded, by supplying considerable quantities of the most useful medicines, etc.

In addition to this effort public collections were made at the various churches and chapels of the town; these facts will, I hope, be accepted as a sufficient reason why our names did not appear in your subscription list.

I remain, dear Sir, faithfully yours,
R. GOODWIN MUMBRAY.

14A, *Hill Rise, Richmond, S.W*

Meeting of the Pharmaceutical Society.

The Inaugural Meeting of the session 1870–71 was held on Wednesday evening, Mr. Sandford in the chair, when there was a more than usually large attendance of members, probably owing to the interest felt in the presentation of the Sandford testimonial portrait, which had been announced to take place on this occasion. Several ladies graced the proceedings by their presence.

The Secretary read the list of donations to the Library and Museum as follows:—

University College Calendar, 1870–71: from the College,—Edinburgh University Calendar, 1870–71: from the University,—Smithsonian Report, 1868; The Indians of Cape Flattery, by Mr. J. G. Swan: from the Smithsonian Institution,—Proceedings of the Newcastle-on-Tyne Chemical Society: from the Society,—Pisciculture dans les Neilgherries; Belanger's Essai de Culture du Quinquina: from M. le Dr. J. L. Soubeiran,—Report on the Specimens of Chinchona in the Herbaria at Madrid, by C. R. Markham; Planchon on Peruvian Barks; Botanical Exchange Club—Report of the Curator and List of Desiderata for 1870: from Mr. James Collins,—Remarks on the Generic name Cascarilla; Notes sur les Quinquinas: from Dr. H. A. Weddell,—On Medical Reform: from Dr. Edwards Crisp,—Address Delivered at the opening of the Botanical Society of Edinburgh, Session 1869–70: from Dr. Cleghorn,—Science et Nature, 2 vols.; De la Bière: from Professor Attfield,—On a Species of *Ipomœa*, affording Tampico Jalap: from Mr. Daniel Hanbury,—Old Manuscript Receipt Book: from Mr. James Baynes,—The Practice of Perfumery: from Mr. R. J. Owen,—43 Specimens of the Educts and Products obtained in working Seaweeds by the Process of R. C. C. Stanford, Esq., of Glasgow: presented by Mr. Stanford,—Specimen of Cape Saffron: presented by Mr. J. R. Reeler, of Cape Town,—Tail of the Musk-rat (*Mygale Muscovitica*), bought at Damascus in April, 1870, by Professor Schwarzenbach, of Berne: presented by Professor Dr. Flückiger,—Bark of *Cinchona Calisaya*, grown in Cordova, Mexico, by M. Nieto: presented by Professor Soubeiran, of Paris,—Specimen of true African Elemi, collected from a tree of *Canarium edule*, Hook. f., growing in the Angola district, Pungo Andongo, by Dr. Friedrich Welwitsch: presented by James Collins (Curator).

Dr. Redwood, being called upon by the Chairman to present his report with regard to the Chemical Class, said that at the close of the twenty-seventh session of the School of Pharmacy he had but little to say, but that little was highly satisfactory. The school had passed through various phases in the course of its history, commencing with a certain degree of prosperity, then suffering under some depression, and again rising to considerable importance. He was happy, however, to state that at no time had it manifested a greater amount of healthful vitality than at present. During the last session the school had been well supported, the students unexceptionable in their general conduct, regular and assiduous in their attendance, industrious in their studies, and some at least, he hoped many, most successful in attaining a great degree of proficiency. In his own class three competitors had eminently distinguished themselves, two very much so indeed. Of the twelve questions submitted to these two gentlemen, every one was answered, and well answered, and estimating the value of complete and perfect answers to these questions at one hundred, the value of the answers given was ninety-four. To both these gentlemen, Charles Fryer and Frederick Hamilton Peck, who were so equal in their attainments, the Council had awarded a bronze medal, and to the third competitor, Mr. Henry Forster, was given an honorary certificate.

The questions for examination were as follows:—

Chemistry and Pharmacy.

1. What is the length, in inches, of a pendulum that vibrates in seconds of time, at the latitude of London, and at the level of the sea?
2. What relation does the *metre* bear to the length of an arc of the earth's meridian?
3. What is the length of the *metre* in inches of our measure, and what is the difference between a decigram and a decagram?
4. In what way does the presence of air affect the accuracy of the determination, as usually made, of the weight or true gravitating force of a body?
5. What is the specific gravity of a liquid a pint of which weighs 9625 grains?
6. Describe the process of clarification, and explain the way in which heat alone, both at and below the boiling temperature, may effect the clarification of a liquid; also explain how liquids are clarified by the use of white of egg and isinglass?
7. At which end of the spectrum are the vibrations most frequent, and where are the waves the longest, in accordance with the undulatory theory of light?
8. Describe some of the principal phenomena on which *spectrum analysis* is based.
9. Describe *Antimony*, and the preparations of it in the Pharmacopœia.
10. Explain the doctrine of equivalence, of modern chemists, as applied to the chemical elements.
11. Describe the production of acetic acid by the various methods by which it is practically obtained, giving the composition of the different preparations of acetic acid (that is, of the acid in various degrees of dilution) of the Pharmacopœia.
12. State the composition, respectively, of alcohol, aldehyd, chloral, and chloroform, and show how the three last-named compounds are obtained from the one first-named.

The Chairman having handed the medals and certificate to the successful competitors,

Professor Bentley presented his report with regard to the class of Botany and Materia Medica. Alluding to the presence of the fair sex amongst his audience, he said he hoped the time would soon come when there would be a ladies' class under his superintendence in connection with the School of Pharmacy. For twenty-two years he had had a pleasurable duty to perform on such occasions, and what he had previously said he could now most conscientiously repeat—for he was quite sure that in no institution, collegiate or otherwise, was there to be found a better class of students, more regular in attendance, more attentive, or more industrious than was to be found in the Pharmaceutical Society. During the last session 112 students had passed through the class which he had the honour to conduct, six of whom had so highly distinguished themselves as to have had honours awarded to them. There was both a *vivâ voce* and written examination; in the former, the two gentlemen who had gained the highest distinction had obtained thirty-four out of thirty-five possible marks, and in the latter, though the standard could not be expected to be quite so high, it was very good indeed. Mr. E. A. Webb, who received the Council Medal, and Mr. F. H. Peck, to whom was awarded a Certificate of Honour, were both worthy of very high commendation, indeed there was but very little difference between them, and Mr. C. Fryer had also very highly distinguished himself. Three other gentlemen also, Messrs. H. Forster, J. P. Jackson, and E. Sainsbury were also well worthy of the certificates which had been awarded them.

The questions for examination were as follows :—

Botany and Materia Medica.

botany.

Hours from Ten till One.

1. Describe the structure of disk-bearing woody tissue and mention the Orders of plants in which it is especially found.
2. What are the distinctive characters between a root and a stem? Define the following :—Corm, bulb, tuber, tubercule, rhizome, and runner.
3. Distinguish between determinate, indeterminate, and mixed inflorescences. Define a spike, spadix, amentum, corymb, umbel, and capitulum.
4. Give a sketch of the changes which the crude sap undergoes in the leaves and other green parts by which it is converted into elaborated sap; and mention the important practical applications which arise from a knowledge of such changes.
5. Give the essential characters of the following Natural Orders, and enumerate the officinal plants which they respectively contain :—*Malvaceæ*, *Papaveraceæ*, *Cucurbitaceæ*, *Scrophulariaceæ*, *Polygonaceæ*, and *Iridaceæ*.

materia medica.

Hours from Two till Five.

1. Describe the physical characters of the seeds and bark of *Strychnos Nux-Vomica*. Mention the physical and chemical characters by which the latter may be distinguished from *Cusparia* bark.
2. What are the botanical and geographical sources of buchu leaves? Describe the leaves of the officinal species yielding buchu. Mention their medical properties, and enumerate their officinal preparations.
3. What is the botanical source of elaterium? Describe how it is obtained in the greatest state of purity, its physical, chemical, and medical properties, the means of ascertaining its purity, and the dose.
4. What are the botanical and geographical sources of Jamaica sarsaparilla? Describe the difference between mealy and non-mealy sarsaparillas. What are the characteristics of good sarsaparilla?
5. Describe the physical and chemical characteristics of virgin scammony. Mention the substances commonly used to adulterate scammony, and the means by which such adulterations may be detected.

The medals and certificates having been handed to the successful competitors,

Dr. Attfield, in making his statement with reference to the Class of Practical Chemistry, said it would be unnecessary for him to read the whole of the report which at the close of the session he had presented to the Council, but it might not be out of place for him to say that for the second time in the history of the Laboratory the balance of the financial account had been on the right side; and, as considerable interest and importance was now being attached to the question of provincial schools, he might mention that for some years past he had kept, in a form available for ready reference, statistics of the Laboratory, which were at any time open to the inspection of any one who might be thinking of establishing similar schools. His books showed the name of every student for the last eight years, the date of his entry and departure, etc., and also tables showing the number of students in any one session or in any part of a session, and the average position attained. During the last session 112 pupils had attended the Laboratory, or about 23 more than in any previous year. Many only came up to study for a short time preparatory to passing their examinations, having already worked at home with the aid of books, and perhaps with some assistance besides. Of course these gentlemen did not attend the lectures, and thus it happened for the first time since the Laboratory had been instituted that the numbers attending were much larger than the entries to the Chemistry lecture class and within one of those attending the Botanical class. He had again to announce, as he did on the previous occasion, that he had during the session held two examinations weekly, in the course of which he took the students at least over the whole chemistry of the Pharmacopœia. These examinations had been remarkably well attended, and seemed so popular, that they would be regularly continued. With regard to the competition for prizes, he might mention that two days were allotted for the examination, the students working from ten to four each day, and books of any kind being permitted, so that it was strictly an examination in practical chemistry. The questions asked, of which copies were on the table, consisted mainly in the analysis of liquids, solids and pharmaceutical preparations, and one essay at quantitative analysis. Twelve gentlemen competed, of whom six were remarkably successful. Mr. Fryer obtained ·92 of the possible number of marks, Mr. Francis ·87, Mr. Best ·85, Mr. Raffles, ·85, Mr. Sainsbury ·83, Mr. Metcalfe ·82, Mr. Webb ·70, and Mr. Peck ·68. In accordance with his recommendation the Council had awarded medals to the first two, and certificates of honour and merit to the others. With regard to the general conduct of the students it was unnecessary to say much, although he might easily enlarge upon this subject, for where the students spent one hour with his colleagues, Professors Redwood and Bentley, they spent from ten to fifteen with him, so that he had abundant opportunities of judging of their mental and moral character and calibre. Of course, as in all schools, he had found during the session perhaps 1 or 2 per cent. of idle and mischievous students,—young men who were well known to all employers, and who were just as dangerous in a shop as any article in Schedule A, and perhaps equally deserved to be locked up and marked "poison;" but even these were all the better for a short stay in the Laboratory. He was glad to conclude with two statements, first, that during the last two days a greater number of applications had been made for benches than at any previous time, though, he was happy to say, there was still plenty of room, additional accommodation having been provided; and, secondly, that during the ensuing session the Laboratory would still have the services of Mr. Tilden and Mr. Moss as senior and junior assistants.

The questions for examination were as follows :—

Practical Chemistry.

Hours: Ten to Five.

Books and memoranda permitted.

1. The "solution" given to you may contain any of the ordinary metallic salts used in medicine; analyse it, and state the results.
2. The accompanying "powder" is also a mixture of common metallic salts; examine it, and report your conclusions.

3. "Tincture of rhubarb." Examine the specimen for methylated spirit.

4. Report on the purity of the following articles:—

Acetic acid.
Diluted phosphoric acid.
Distilled water.
Glycerine.

5. "Bleaching powder." State the percentage of chlorine in the sample.

Professor BENTLEY announced the result of the contest for the Herbaria Prizes. These prizes were offered to young students,—the object being to encourage the study of Botany amongst these young men scattered throughout the country when they had opportunities of collecting specimens, which, in all probability, they never would have again, and in this respect they were particularly valuable. On the present occasion, this contest had been peculiarly successful,—four very excellent collections having been sent in, two particularly being of most exceptional merit, so much so indeed, regard being had not only to the care with which the specimens had been collected, the admirable manner in which they had been preserved, but also the mode in which they had been arranged, and particularly the knowledge exhibited in naming them, that it was impossible to choose between them, and both collections were on the table, where he hoped parties would take an opportunity of inspecting them. One was sent by Mr. Webb, who had already taken a prize in Botany and Materia Medica; and to show the advantage of sound early training, he might mention that this gentleman was residing with their friend Mr. Deane. The second collection was equally admirable, and was contributed by Mr. Rammell, who was living with Mr. Jackson at Crediton. It was interesting to notice, as showing the great influence of good training on an industrious student, that this gentleman was the fourth who had successfully competed for this prize whilst residing with Mr. Jackson. Silver medals had been awarded to both these gentlemen, and amongst the others more particularly deserving of honourable mention, were Mr. Alexander Wood, who obtained a Certificate of Honour, and Mr. C. J. Stansby, who obtained a Certificate of Merit.

Mr. DEANE said, some persons might imagine as he was the Examiner in Botany, that Mr. Webb might have had certain special advantages afforded him in making his selection, but he had much pleasure in stating that that gentleman had been so conscientious in the matter, that he would not receive any assistance from him beyond a little instruction in the mechanical arrangement and setting out of his plants. In every other respect, the collection was entirely his own work.

Mr. HASELDEN (Vice-President) in announcing the name of the successful competitor for the Pereira Medal, said he had had the honour of examining the papers. Seventeen gentlemen were eligible to compete, four of whom did so, of whom Mr. Peck was the successful candidate. With respect to the Prize of Books, he had had the pleasure not only of setting the questions, but also of conducting the examination, in conjunction with his friend Mr. Cracknell. Out of twenty-nine eligible to compete for this prize, seventeen entered, and the work was very well done by nearly all; so much so, that great credit was due to Mr. Webb, who had succeeded in carrying off the prize.

The questions for examination were as follows:—

PEREIRA MEDAL.

Section I. BOTANY.

Time allowed: Two Hours. Competitors are required to answer at least Two Questions in each Section.

1. Describe the germination of a bean and of a grain of wheat.
2. Explain the terms *achene*, *drupe*, *berry*, and *capsule*, and give an example of each.
3. What are the principal medicinal plants growing in England? Enumerate them, stating which occur wild and which are cultivated, and mention the Natural Order of each.
4. Explain botanically the nature of *Ergot*.

Section II. MATERIA MEDICA.

1. Enumerate the medicinal products of the Order *Euphorbiaceæ*, naming the plant from which each is derived and the country in which it grows.
2. What are the chief constituents of *Opium*? Name the more prominent characters by which some of them may be recognized.
3. What is the alkaloid of *Greenheart Bark*, and in what other substance has it been observed to exist?
4. In what countries and by what plants are the following drugs produced,—*Star Anise*, *Winter's Bark*, *Galangal*, *Venice Turpentine*, *Fenugreek*, *Grains of Paradise*, *Bay Berries*, and *Elecampane*?

CHEMISTRY.

Time allowed: Two Hours.

1. Describe the laws of substitution, giving at least three instances of substitution products.
2. What is the action of the following metals on nitric acid:—copper, gold, silver, tin, and zinc?
3. Describe tartaric, citric and malic acids, and their derivatives. What change occurs when these three acids are heated separately with caustic potash?

PRIZE OF BOOKS.

DISPENSING AND PHARMACY.

Time allowed: Two Hours. Standard Number of Marks, 300.

State the best method of dispensing the following prescriptions, assigning the reasons for the same, and write the labels in suitable language:—

℞ Potassæ Tartratis ʒiij.
Potassæ Bicarb. ʒij.
Acid. Citric. ʒiss vel q. s.
Spt. Æther. Nitros. ʒvj.
Mucilag. Acaciæ ʒiv.
Aquæ Destill. ad ℥vj. M.

Ft. mist., pars sexta horæ tertiis partibus capienda per vices tres, posteà singulis horis.

℞ Camphoræ gr. iij.
Ext. Hyoscyam. gr. $\frac{1}{2}$.
„ Opii gr. $\frac{1}{2}$. M.

Ft. pil. hor. somn. sum. et repet. inter noctem dolore vel inquietudine perstante. Mitte viij.

State the proportions of the ingredients in, and the method of preparing, the following decoctions:—cinchona, hæmatoxylum, hordeum.

Describe and explain the P. B. process for preparing extractum glycyrrhizæ, suggesting any improvement that might be made.

State the reason for directing the albumen to be separated from the extracts of aconite, belladonna, hemlock, henbane, and lettuce.

Describe and explain the process of the Br. Ph. for making syrup. tolutanus.

The CHAIRMAN said, before calling upon Mr. Schacht to deliver the address, he could not refrain from saying a word of welcome to the students for the forthcoming Session, keeping up the good old rule to speed the parting guests. There was no duty appertaining to the office which he had the honour to fill of a more pleasurable character than the distribution of the prizes. It took them back to the institution of the school, and brought before their recollection the services of all those who had worked so hard in bygone days, forgetting their own interests and thinking only of those who were to come after them in establishing the means of obtaining a sound education for the rising generation. It was a great pleasure to think of the work they had done, and a still greater pleasure to see that their efforts had not been wasted. They had this evening before them the gentlemen who had carried away the prizes; but, as Professor Redwood had said, there were others who might have competed if they had thought proper; and whether they gained prizes or not, they all gained benefit. Those whose names had not been mentioned to-night he hoped would be heard of by-and-by in after life, and he hoped all would remember that the most important part of their labour was about to commence. They had shown that the stuff was in them, and he hoped they would go on thoroughly and earnestly in the work they had undertaken, and do all in their power to advance the body to which they all belonged. In using the word "all," he could not forget that many who had taken prizes there had gone away to higher pursuits; but he believed that the field of pharmacy now offered a better position to young men than it ever had done formerly, and that there was abundant room for them to exert the talents which they had shown themselves to possess. He hoped, therefore, they would only take leave of the school in order to become connected with the Society as full members or associates, and he earnestly trusted that the same success which had attended them hitherto would follow them through the whole of their future career.

Mr. SCHACHT then delivered the following address:—

MR. PRESIDENT, LADIES AND GENTLEMEN,

Before commencing my immediate subject, I wish to say one word about myself. I must ask you to accept my assurance that I am in no way responsible for the fact that this person occupies this position at this moment. It is the result of the spontaneous act of the Council. The arrival of the Secretary's note that contained the resolution nominating me to this duty literally and truly filled me with surprise; and I felt as some private soldier might be expected to feel, should his commanding officer summon him from the ranks to manœuvre the regiment at full parade. One moment of utter surprise, and consequent hesitation, in both his case and my own, might, I trust, be deemed excusable—no more than this, however, would duty permit; the next must see us delivering our salute, and proceeding to obey our orders with what skill we may, our respective commanders being mainly responsible for the results.

The two gentlemen who have immediately preceded me in this duty approached their task with unusual claims to respect and attention. The one was strong alike in evidences, spread over many years, of wise and generous interest in the progress of his calling, and in the consistent manifestation of those qualities of mind, life and character, that have stamped him, even in these somewhat fortunate times, the model pharmacist. The other was an approved man of science, and a justly recognized leader of even the advance-guard of pharmacy.

Such credentials went far, not only to inspire their owner's words with special and peculiar force, but to justify their adopting, most becomingly and fitly, the tone of the teacher.

From no such point of vantage can the present address be uttered. It must come to those for whom it is intended from, as it were, their very midst. I must speak to them as one of themselves or not speak at all; for I am no teacher, the utmost that conscience will suffer me to hope is that through all my days I may continue to be an earnest and reverential student of scientific truth. But those that called me hither knew this, no doubt, perfectly well, and deemed it perhaps not altogether a matter of regret. They may have estimated this ceremony (as I may presently desire to repeat) as an occasion when for grave public reasons its prominent actors would be most fitly selected from amongst the obscure; or, it is possible, they may have deliberately chosen as their spokesman to a body of students one whose name was in some measure associated with a plea for the student class, and an effort, slight indeed, but still an effort, to supply the student's wants.

Let me, however, at once disown any special claim for consideration upon this latter score, for, in the first place, it would be by no means my exclusive right, many others having laboured in the same direction fully as earnestly as myself, though, perhaps, somewhat more silently; and, in the next place, my plea was not for students within these walls. Year after year as they have assembled to the launch of successive sessions of this school, I have envied them far too much to discover aught to plead for in their behalf. It has been for those outside these walls and outside this city that my plea has been raised. Twenty times the number that can gather here are compelled to stay without; for every single student that has the good fortune to revel amidst the riches of this school, at least twenty of the student class are debarred from ever setting foot within it. Of these some, it must be confessed, are kept away by nothing but their own indifference and carelessness. These are the drones of pharmacy, and a sad difficulty they have ever been, encumbering and marring every effort for professional advance, and discouraging all but the most earnest of the advocates of progress. But let it not be for one moment supposed that all who are not here are drones and idlers—that only one in twenty of our great student class have any care for science or for intellectual culture. Many long with all their souls for the advantages to be gathered here, and gratefully welcome every opportunity for improvement that is offered, even though it fall short of their ideal. And fall short, alas! it always does; for local effort, however earnest, and however fortunate, finds itself dwarfed and disparaged when compared with an imperial organization such as this; and it is not wonderful that observers who have some knowledge of both should be driven to reflect upon the differences that exist between them, and should endeavour to weigh their value and their effect upon the broad interests of pharmacy.

This important subject, I rejoice to know, at length occupies the serious consideration of our executive, and will, I freely hope, ere long receive a wise solution. In the meantime, local effort has done something; and it is gratifying to know that in several provincial centres courses of study similar in kind to that pursued in this school, and very good in quality, are at this moment in operation; classes of anxious, hopeful, curious students are mustering for fresh sessions, there as here, and are equally expecting the revelation of good things. Bear with me then when I say that it is with these and with the less fortunate ones still, who have yet to long and wait in patience, that my first sympathies lie, and for whom I would spend the chief of my voluntary labours.

But it would be strange if, with such a sentence on my lip, my heart could fail to find a word of welcome for others also,—for all indeed who have the mind to estimate the value of scientific culture, and the pluck to make the effort for its attainment. I said I envied the students of this school. By this was meant, not that I begrudged them one particle of the good fortune they are enabled to enjoy, but that I sighed to think so few, comparatively speaking, could grasp the fine opportunities this school affords. No, my only words to-night shall be, as I would wish them ever to be to all my fellow-students, words of heartiest congratulation.

So, then, most warmly, most heartily I congratulate you, my fellow-students, that you have determined, for yourselves at least, life shall not lose its greatest joy; that, although some around you select the husks of life, and pretend to be content therewith,—nay, try to persuade themselves and others that husk is the chief object of the plant's whole growth, and runs no risk of being trodden down at last of swine,—you have resolved that all this is specious and false; that you will look straight into truth itself, will pierce the husk, will grasp the seed and plant it anew in fair and cultivated soil, there to take root, grow and bring forth good fruit. Are not all who have so resolved indeed to be congratulated? They have touched the great law of universal Continuity, than which nothing can be nobler, "Be fruitful all;" and from henceforth a healthy unrest, a longing to fulfil a higher work urges their lives onward, upward. I said life's greatest joy; can one greater be hoped for man than that he should humbly attempt to fulfil his great Maker's purpose?

But the resolve is not quite all. There is no need surely to quote the many well-known words of wisdom you have learned upon this point.

Were I to begin with "Hell is paved with good intentions," and quote on till I gave you the parable of the seed that fell on stony places, I should but remind you of temptations of which you already know. I hint at them only because they give me grounds for further congratulations, for you are about to surround your good resolves with conditions the most favourable for their sustentation. These are—the enthusiasm of numbers associated in a common object,—the influence of method and methodical training—and personal contact with able and earnest teachers. These are very potent agencies, and are worth a moment's thought.

The mind of the young man is, as you know, in the very gush of its ardour; the enthusiasm of youth is proverbial, and not only constitutes one of its greatest charms, but is one of its real powers also; yet, perhaps in a greater degree than is the case with most of the attributes of poor humanity, it is erratic, prone to change and prone to languish. Let its emotions, however, have been but originally genuine, and the contagious influence of another's constancy, aided by the warm breath of friendly encouragement and friendly rivalry, is almost sure to fan the fading spark to a flame again. Depend upon it each can do much to help his comrade's constancy, very much to sustain the general gaze upon the general purpose.

To the same end also works that grand abstraction, method. Of all the qualities essential to the fair cultivation of that which is called mind, method appears to me to stand the first. Shall I therefore venture to say one word for the more general cultivation of mathematical studies amongst our younger pharmacists? From this place have been heard frequent and eloquent utterances in praise of classical culture; I willingly endorse them. It is not perhaps the special direction of my own taste, but I recognize its value, and appreciate the pains that others bestow upon it. Moreover, I am aware that in one direction at least it is essential to the proper fulfilment of our professional duties. But mathematics, which is indeed method, should, it seems to me, precede all special studies, or, at any rate, should accompany them side by side. The processes of mental and of corporeal development in many respects resemble each other; mind as well as body requires both food and exercise for its proper growth; the mere pouring in of meat and drink does not necessarily develope a healthy and vigorous frame; good wholesome exercise is needed for the double purpose of carrying every proper food-atom in streams of vital power to its appointed place, and for removing all that is superfluous, used up and baneful. What judicious exercise is to the body the science of method is to the mind; it assorts and arranges all its mental pabulum, and exalts to the utmost its powers of assimilation. It would perhaps be difficult to conceive of a mind, properly so-called, utterly and entirely uneducated in method, but one in which this quality is fully cultivated starts for the attainment of any branch of knowledge at a wonderful advantage over another not so tutored; even such indeed as the trained gladiator would possess over the peaceful citizen in a contest of physical strength. True, that in the patient study of a science such as chemistry, with all its inherent logic and its splendid mathematical developments, the pupil, almost despite his previous habit of mind, becomes imperceptibly educated in the law of method, and in proportion as this occurs he reaps for himself a double reward. But he has much to overcome, much leeway to make good before he can compete with his better-equipped rival, who has brought to the task an organization of power so complete that from the very first step each new fact as it is revealed, with all its attendant bearings, drops at once into its proper and appointed place, for ever after a veritable portion of his being.

I have been led to these remarks, which may to some appear unnecessary, from having more than once met with professed students of chemistry who were evidently ignorant even of the essential nature of an equation; and I hope, should there be any amongst those I am addressing whose attention has not hitherto been enlisted in these studies, they will make every effort to supply the omission, so that they may reap the fullest advantages of the methodically-conveyed instruction that will be presented to them.

But I return to the last of the three agencies indicated—the influence of the teacher upon his pupils. All teachers undertake a serious and a very trying responsibility; and in some departments of education their difficulties must be very great indeed. In those, however, with which we are mainly concerned the splendour of the subjects taught, and the illimitable interest that attaches to them, must go far to save the teacher from the sense of weariness and *ennui* so likely to attend the repetition of an ordinary oft-told tale. I cannot otherwise explain the constant freshness and enthusiasm of our professors of chemistry and botany, which, when I was a much younger man, used to fill me with surprise. In those days I had the good fortune to be a lecture-pupil under two very eminent men—the late Professor Brande and the late Professor Fownes. They were both, as you know, illustrious chemists, and they were both teachers of their science. One was old, and had been lecturing upon chemistry for thirty years; the other was young, and had but just written the beautiful Manual that bears his name. Was the old man dull, weary of his subject, and careless of its effect upon his pupils? and was the young man poetic, ardent and anxious? The younger man was, indeed, all that hungry student could desire, and so, also, was the elder. His thirty years of teaching had not diminished, by one sparkle, the energy and freshness with which in his youth he had been wont, as the coadjutor of Davy, to expound the great truths he had helped to unfold. He could, and he did, enkindle enthusiasm as genuine and as ample as attended the efforts of any of his juniors. And so I find it ever—in London and in Bristol—thirty years ago and now. Nor should I ever have wondered at the matter. Is there so great a difference between a "thing of beauty" and a "thing of truth," that one is a "joy for ever," and the other may become a weariness in a paltry lifetime? Are they not rather convertible terms? Is not their essence identical—their source One? So at least experience seems to teach, for I find that when I am helping some young beginner to apprehend a little of what is involved in the fact that 2 parts of hydrogen unite with 16 parts of oxygen to the production of water, or when I read to my children the beautiful history of "germination," my mind falls perforce into an attitude of reverence, and becomes penetrated with a consciousness of sublimity as vividly now as when, as a youth, their first realization filled my eyes with tears. No living creature can be indifferent whilst unfolding the splendours of scientific truth, provided only his audience be in some accord with him. The single thing that has the power to drag his spirit down from the lofty regions where dwell his themes, is the consciousness that he is surrounded with masses of dull clay that either cannot or will not mount with him. When this does occur, his task is, indeed, a heavy one; his whole being contracts with a rigour that no effort from within can overcome; his entire organization suffers a collapse; but, on the other hand, let him but feel that he is addressing willing ears and open minds, and (I appeal to the experienced teachers around me) then he enters the treasure-house boldly as one who has a right, and scatters lavishly all its precious stores.

You see then, I hope, that all these influences are helpful, and, what is more, that their power for helping is largely in your own keeping.

And I can surely once more congratulate you, for you will, most likely, be surrounded with enthusiastic companions, you are certain to have able and earnest teachers, and your instruction will be excellent in quality and systematically conveyed.

It remains only that, having such opportunities, you should make the best possible use of them. You have elected to study here because this is the best school of pharmacy in the country. Mind that the scholars are worthy of it. Look well to your laurels and to the credit of the school, for I promise you there will be some running close upon your heels who, handicapped though they be, will make a sturdy race of it.

But there remains something more to be said; at least, I should blame myself did I not give expression to a thought that has been for ever obtruding itself whilst writing these lines, especially when I endeavoured to realize this scene. I felt persuaded that when we really met, and I had approached the conclusion of my address, the question would occur, What does all this ceremony mean? Are the leaders of this great Society assembled,—has all this fair and goodly company come together for the sole purpose of doing honour to some scores of young men the majority of whom as yet, have done no more than declare their desire to study, and of listening to a few commonplaces from an obscure provincial. Candidly, I think not. They are glad, right glad, to welcome you. They are glad, I will be bold to say, to greet me; but beneath and above any such slight purpose runs a meaning in this gathering, in the presence of which you and I individually are nothing, except in proportion as we are content to merge ourselves within it. Every man lives a double life, or rather his life has two relations,—an inner life, for which in this world he is responsible to his conscience alone, and an *outer* life, which relates him to his fellow-creatures, and in which occur his thousand opportunities of influence for weal or woe. In the one he may aspire so high as to become the temple of the Holy Spirit; in the other, to be as a light set upon a hill, to shine for all men's benefit. As with the individual, so with societies of men in their corporate capacities. This Pharmaceutical Society has a life to live before the world which imposes obligations as constraining as those which relate it to its own members; and the proceedings of to-night constitute one of the legitimate occasions for its public confession of faith. It may be that for a moment my voice is the one most distinctly heard, and yours the ears most directly addressed; but my interpretation of this ceremony assures me we are but puppets standing for the moment in the place of an idea, and that by giving (as is done to-night) the places of honour to the youngest, and to the least distinguished of her votaries, this Society declares its homage to *science herself;* and records its conviction that although its range of duties may at times include matters that savour of privilege, of trade, and even of private interest, yet that pharmacy is absolutely and verily a branch of pure truth.

Be this the general conviction or not, it is mine, and justifies me, I trust, in the expression of a hope that each one of you will enter upon his work with a serious spirit and a consciousness of real responsibility.

I have urged you to look to your laurels and to the credit of your school, and I now, in the name of the whole Society, wish you heartily and sincerely every success in your studies. Distinction and honours are within your reach,—strive for them by all means and enjoy your rewards to the full; but I should rejoice to think that in the midst of any triumphs the future may bring, when the heart was beginning to swell with the pride of first achievement and success was threatening to awake the flame of vanity, some lingering memory of the higher obligation I have just indicated might serve to restore you to a humble spirit. I would that you and I could at all times remember we are not mere units, with privilege to live for ourselves alone, any more professionally than privately. We are ingredients of a body corporate, whose honour is to the extent of our opportunities committed to each one's care, and it is our bounden duty to preserve it pure. Let us aim high, therefore, and yet be lowly, seeking the general advance rather than our own advantage; in a word, let our first efforts be to become Christian gentlemen, and then, for certain, every fresh attainment we may acquire, and every meed of honour we may gain, will become a new grace and a new dignity for our common mistress Pharmacy.

The Chairman in proposing a vote of thanks to Mr. Schacht, said there was a little matter which he had forgotten to mention when distributing the prizes. As they were aware, Mr. Hills, the treasurer, last year published a portrait of Mr. Jacob Bell at his own expense, intending to give the whole of the proceeds of the sale to the Society to be distributed in a prize of books. The portrait had not sold so well as had been anticipated, but Mr. Hills' generosity was was not to be baulked, and he had therefore augmented the sum realized by a further donation of money, making in all an amount of stock which would produce £10 a year. The details of the prizes were not yet definitively arranged, but it was proposed that a prize of books should be given every month to those who passed the best Minor Examination; many members of the Council, whose opinion was of great value, thinking that prizes being awarded to these young students would have the effect of leading them on to further exertions. After announcing the next meeting, the Chairman said he had concluded the business of the evening, but he understood there was to be an afterpiece of which he was to be the subject, and he would therefore beg leave to withdraw.

Mr. Frederick Barron having been requested to take the chair, said he was much gratified at the honour which had been conferred upon him. As the meeting were aware, upwards of £500 had been subscribed by the trade for the purpose of presenting the President with a suitable testimonial, and though this did not appear a very large sum, yet considering that chemists as a body were not very wealthy, he thought they need not be ashamed of what had been done, and what had been given was given heartily and freely. Mr. Sandford enjoyed the affectionate respect of all who knew him throughout the length and breadth of the land, and in the Society to which he had devoted the best efforts of a great part of his life he was deservedly popular. His time was exceedingly valuable; he was a man not only of a large and generous heart, but of a highly cultivated mind, and he had given to the Pharmaceutical Society much more of his time and attention than could fairly have been expected of him. The result was, that, seconded as he had been by the efforts of his colleagues and of the able professors connected with the Institution, they had not only obtained the Pharmacy Act, but had placed the Society in a higher position than it had ever before occupied. Having referred in terms of high approbation to the addresses which he had heard on that and similar occasions, Mr. Barron requested the Secretary to uncover the portrait of Mr. Sandford, the sight of which elicited a burst of applause. He stated that the selection of the artist, Mr. Knight, R.A., had been made after the greatest deliberation, and he believed the result showed that their choice had been a wise one. He understood that Mr. Sandford, with great generosity, had expressed his intention of handing over the portrait to the Society, and it would probably be hung by the side of the portrait of Mr. Allen, their first President, whom, in his personal character, Mr. Sandford in many points resembled. In conclusion, he was sure all who heard him would unite in wishing long life and happiness to their esteemed President, and he invited them to join in giving three hearty cheers.

Mr. Mackay having proposed a vote of thanks to Mr. Barron for his services as Chairman of the Testimonial Committee, which was briefly acknowledged, the proceedings terminated.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The Annual General Meeting of the Association was held on Friday, September 30, at the Philosophical Institution; Mr. Stoddart, President, in the Chair.

The minutes of the previous meeting having been read and confirmed, the following report and statement of accounts were read and adopted:—

Report.

The Council of the Bristol Pharmaceutical Association have great pleasure in presenting to the members their first Annual Report. They have endeavoured to fulfil their appointed duty. Their instructions were "to use their best efforts for the establishment of a thoroughly efficient school of pharmacy, and to arrange a series of open meetings for the delivery of lectures and the reading of scientific papers." With regard to the latter portion of these instructions, they have to report that on each second Friday of the months November and December, 1869, and January, February, March, April and May, 1870, useful and interesting matters were presented to the members and associates in the form of lectures and papers. The lectures were delivered by Mr. Coomber, Mr. Gilford, Mr. Townsend and Mr. Wm. Lant Carpenter, and the papers were read by Mr. Boucher, Mr. Stoddart, Mr. Giles and Mr. Schacht. At most of these meetings good attendances welcomed the lecturers; but the Council regret to have to notice that on occasions when distinctly pharmaceutical subjects were announced the attendances were the smallest; a fact that they feel must operate to the discouragement of those who would otherwise be willing workers for the general good.

In reference to the establishment of a school of pharmacy, the Council have to report that they have availed themselves of the best resources at their disposal for the attainment of this most important object. They are quite aware that as yet Bristol does not possess a perfect school of pharmacy, but they have been able to arrange four complete courses of lectures upon the most important portions of pharmaceutical education, viz. chemistry, organic and inorganic; and botany, structural and systematic. They are satisfied that, as far as they have been able to proceed, the character of the instruction given has been the best of its kind, and they are glad to be able to report that a fair number of students have availed themselves of the opportunities thus offered, and have proved the excellence of their instruction by passing in goodly numbers the Government examinations. The Report then gave the details of the examinations, and the names of those who had received prizes at the end of the Session, already printed in our number for August 27.

The plan for these lectures adopted by the Council consisted in making arrangements with the teachers of chemistry and botany in the Government science classes at the School of Mines, by which those classes became open to any number of pharmaceutical students presenting the ticket of this Association. They were thus enabled to offer to their associates complete and excellent courses of lectures for very small fees, one stipulation only being made, that they should present themselves for examination at the conclusion of the course.

Some doubts having been expressed as to the probability of this course being approved by the Lords of the Committee of Council on Education, a communication was forwarded to the department by the Honorary Secretary requesting a formal statement upon the point. The reply was in every respect satisfactory, and definitely asserted that students in pharmacy are entitled to every advantage that the science classes can afford.

The Council have full confidence that their successors in office will be gradually enabled to develope these initiatory measures into a complete school of pharmacy, and are rejoiced to see that the Council of the Pharmaceutical Society of Great Britain are taking steps that appear to lead to the desirable system of granting pecuniary aid to provincial efforts in scientific education. They believe such a course to be both wise and just, and they congratulate the whole body of English pharmacists on the prospect for good that it opens out to them.

The Council cannot conclude their report without acknowledging the courtesy of the Committee of the Philosophical Institution, who, at all times, have so readily granted the Association the use of their Theatre and rooms.

The Treasurer in Account with the Bristol Pharmaceutical Association for the Year ending September 30, 1870.

Dr.	£.	s.	d.
To 59 Members' Subscriptions	30	19	6
,, Donations	1	1	0
,, 39 Associates' Subscriptions	9	15	0
,, Cash received for Lecture Fees	10	10	0
	£52	5	6

Cr.	£.	s.	d.
By Cash and Receipt Book	0	7	6
,, Postages	4	3	0
,, Printing	5	9	6
,, Prizes for Students	6	1	4
,, Fees to Lecturers	14	14	0
,, Donation to Philosophical Institution for Use of Room, etc.	6	6	0
,, Balance	15	4	2
	£52	5	6

HALIFAX AND DISTRICT CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Winter Session of the above Association was commenced on the 9th September by a General Meeting of the members, at their room, in the Mechanics' Institute; Mr. Stott, Vice-President, in the chair.

The Chairman, alluding to the severe illness of the President, expressed the great regret which was felt by the trade at his continued indisposition, and the hope that an early recovery would take place. He said the subjects for the evening's consideration were of great importance. The Committee of the Association was thoroughly intent upon pushing forward measures of improvement, both in relation to the members and their young men, and the summer, which is usually considered as a respite from committee work, had this year been employed in ascertaining the feelings of the majority of the trade in reference to the proposed measures, and in forming such plans as would be of general benefit; he felt sure that the earnestness which the Committee had shown, as well as the disinterestedness of their work, would keep alive that enthusiasm which founded the Association, and which the numerous attendance at the meeting showed to be unabated. Before entering into the discussion of these matters, he would call upon the members to elect delegates to the British Pharmaceutical Conference, to be held in Liverpool the ensuing week; the objects of these yearly conferences were so well understood amongst them, that it would be unnecessary on his part to dilate on the necessity of giving them their cordial support.

After some discussion, it was resolved unanimously, "That Messrs. Stott and Farr be the delegates from this Association to the British Pharmaceutical Conference."

The Secretary, Mr. Hebden, then informed the members that the Committee had succeeded in engaging a suitable teacher for botany, and the class which was commenced in the early part of summer would cease at the end of autumn, till the following spring, when it would again commence. This arrangement was necessary, so as not to crowd and confuse too much the studies of their young men. Chemistry and Latin would constitute their studies during the winter. The teacher had arranged for a number of meetings early in the summer mornings to give the students practical illustrations of his teaching. The popularity of the study of botany amongst these young men was strongly evidenced by the fact that the number of students was double that of the other classes. The Committee had fixed the student's fee at 5*s*. the term, and as the fee of the teacher and other incidental expenses would amount to much more than would be thus received, and as it was also considered desirable that a prize should be offered at the close of the term for competition, the Committee trusted it would be agreeable to the members that the amount of the deficiency and prize should be paid from the general fund of the Association. In reference to the classes in Chemistry and Latin, he read a letter from Mr. Gibb, the Principal of Haley Hill College, in which was stated the number of students in each class, their regularity of attendance, their success at the college examinations last May, and the earnestness with which they devoted themselves to their studeis. The Latin class, at the express wish of the students, was now continued throughout the year. The only matters he had to complain of were that the number of students ought to be greater, considering the number of young men connected with the trade in the town; and of the lateness of business hours, which was a most serious obstacle to successful studying.

The members entered generally into the discussion of these classes, and a desire was expressed to give their young men every facility for early and regular attendance.

Mr. Farr proposed, and Mr. Brooke seconded, "That the Secretary be empowered to pay out of the funds of the Association such amounts as may be required to meet the wants of the Botany class." Carried unanimously.

Mr. Shaw stated his intention to offer a prize in March next for competition in materia medica, conditionally that there be a reasonable number of competitors.

The Secretary then informed the members as to the success which had attended the efforts of the Committee for curtailing the business hours of the trade; they had proposed to the members individually that every night except Saturday night the shutters should be put up at 8 o'clock, and the door finally closed at 8.30; "matters of necessity would of course be attended to at the back doors," and on Sundays no shop door to be opened.

A great majority expressed their acquiescence to this plan, but a few had not as yet given a decided reply; it would be for the meeting to consider what course would be best to pursue.

Mr. Jessop considered the plan far too moderate, and would propose that the shutters should be put up at 7 o'clock, and finally close at 8.30. He considered that this would be a mild but eventually effectual protest to the public against late shopping, and it would enable them to set their young men at liberty much earlier to pursue their studies.

Mr. Pollard and Mr. Brookes spoke in support of this plan.

The Secretary begged of Mr. Jessop not to press this proposition. At the present meeting it would no doubt be carried by a majority, but its only result would be to embarrass the Committee. Moderate as was their own plan, it was still a matter of doubt as to its success. It would be, therefore, impolitic to attempt anything more difficult. Whatever engagement the members entered into, would depend in a great measure for its fulfilment on the confidence they had in each other, and it would risk the very foundation of the Association if it risked the breaking of that confidence.

Mr. Shaw would support the plan of the Committee, although he sympathized with the more advanced proposition.

Mr. Brierley said success, however small, must first be attained, and the next step would be all the more easily gained, whereas if too much was attempted, the project would fall to the ground. The small change advocated by the Committee would introduce the thin end of the wedge.

Several of the members supporting this, Mr. Jessop withdrew his proposition.

The plan of the Committee being thus agreed to, a deputation was appointed to wait upon those who had not yet stated their intentions.

The Chairman then drew the attention of the members to the time, which was too far advanced to introduce further subjects for consideration, especially so as the next subject was a most intricate and difficult question, viz. "Uniform Retail Prices." It was absolutely necessary that the most complete and clear understanding should be established, and that the question should be discussed in all its details; he should therefore adjourn the subject till their next monthly meeting.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Tuesday, September 13th.

The Specific Gravity and the Actual Weight of certain "Volume-Measures" of Various Liquids and Preparations.

BY F. M. RIMMINGTON.

Our system of weights and measures, as well as our pharmaceutical practice of using weights and volume-measures for fluids are both so irregular and unsystematic, that all engaged in pharmacy cannot but have experienced the inconvenience of having constantly to convert measures into weights and weights into measures. The frequent experience of this want myself, suggested to me, some time ago, the desirableness of a table of the principal liquids in use in pharmacy, accurately ascertained from authentic samples, in order that exact computation may be made by its data. The utility of such a table is confined to such liquids as profess, or are intended to be, of Pharmacopœial strength.

Some attempts of a similar kind have been made in some of the foreign Pharmacopœias, and a paper was read by Mr. Laird at the Norwich Conference, but he only gave a few examples, and the scope of the paper was confined to the specific gravities of tinctures.

It was my intention to have added another column, giving the percentage amount of extractive contained in the tinctures, which would have greatly increased the usefulness of the table, forming a standard of quality to which reference could be made, but pressure of other engagements compelled me to relinquish the task before it was completed.

A Table showing the Specific Gravities and Weights of certain Volume-Measures of various Pharmaceutical Liquids.

Name of Liquid.	Specific Gravity.	Weight of 16 fl. oz.		Weight of 20 fl. oz.		Weight of 1 gallon = 10.		
		oz.	grs.	oz.	grs.	lbs.	oz.	grs.
Æther. B.P.	0·735	11¾	10	14	56	7	5¾	
Æther. purus, B.P.	0·720	11½	14	14	29	6	14¼	31.
Sp. æther. sulph. ..	0·809	12½	94	......		7	15.	66
„ chloroform.....	0·871	13¾	87	17¼	90	8	11¼	105
„ æther. nitros...	0·845	13½	15	16¾	81	8	7¼	41
„ ammon. co., B.P.	0·870	13¾	80	17¼	80	8	11¼	34
„ „ P.L.	0·918	14½	87	17½	63	8	12	67
„ vini rect.	0·838	13¼	70	16¼	38	8	6	44
„ tenuior	0·920	14½	3	18	12	9	1	30
Chloroformum	1·497	23¾	89	29¾	77	14	5½	16
Tinct. aconiti, B.P.	·855	13½	70	17	52			
„ „ P.L.	0·859	13½	90	17	84	8	12	
„ cantharid. ..	0·924	14¾	13	18½	8	9	4	60
„ cardam. co...	0.954	15¾	..	19	60	9	13½	
„ cinchon. flav.	0·937	15	20	18¾	..	9	6½	
„ cinchonæ co.	·939	15	18	18¾	20	9	6½	
„ camphor. co.	0·923	14½	95	18¼	90	9	3	76
„ digitalis	0·938	15	..	18¾	24	9	6¼	
„ ferri perchlor.	1·0064	16	44	20	56	10	1	
„ hyoscyami ..	0·937	15	20	18¾	40	9	6	
„ lobeliæ æth.	0·810	13¾	90	16	99	7	15½	
„ opii	0·940	15	17	18¾	54	9	6¾	
„ rhœi	0·942	15	39	18	38	9	6¾	60
Vin. ipecacuan.....	0·993	15¾	74	19¾	73	9	15	84
Dec. sarsæ co. conc.	1·055	16¾	65	21¾	44	10	9	
Syr. simplex	1·336	21¼	57	26¾	30	13	5¾	

The President said that the contents per ounce were concident with the specific gravity; for instance, lemon juice, having a sp. gr. 1040, would contain 40 grains of citric acid per ounce, and so on, except in such cases as alum and sulphate of soda, where there is much water of crystallization. In those cases it would be half, or 20 grains per ounce.

Mr. Reynolds (Leeds) referred to the rule laid down by Dr. Roberts, of Manchester, in regard to urine. This was that, roughly speaking, the units and tens of the specific gravity, when compared with one thousand parts of water, represented the grains of sugar in an ounce of diabetic urine.

Dr. Watts (London) referred to recent and other researches on the supposed porous condition of liquids, and the extent to which anhydrous salts, which dissolved in liquids without increasing the bulk of those liquids, were considered to occupy an interstitial position in regard to the particles of which the liquids were composed.

Concentrated Compound Decoction of Sarsaparilla.

BY MR. F. M. RIMMINGTON.

The preparation of sarsaparilla so long known in the trade as concentrated decoction of sarsaparilla has received less attention, perhaps, than any other galenical preparation at the hands of scientific pharmacists. No criteria have, to my knowledge, been given of what it should be; and, considering the large demand for it, there is ground for supposing that some samples are not quite all they should be. It is a preparation, too, that is not easily judged by the senses. Samples are sometimes met with of such intensely deep colour that suspicion is excited. Other samples appear to have a greater consistence, and sometimes the taste of licorice is stronger than it ought to be. Now, all these appearances may be fallacious; some data upon which to enable the mind to form a judgment are required. Sarsaparilla itself has nothing very distinctive in it. There are no alkaloids to estimate, and the only datum is the amount of extractive afforded by a given quantity of root. All this uncertainty I have experienced, and have attempted to fix a standard of comparison.

I assume, from my personal experience, that the specific gravity of a liquor made with good root, in the proportion of a pound to a pound of fluid and 10 per cent. of spirit, ought to have a gravity of from 1·045 to 1·055. But as the specific gravity alone is insufficient as a test, as it may be affected by several circumstances, but, taken in connection with the amount of extractive contained in a given volume, it is of some value. But as the amount of extract may be influenced by the addition of other extracts, and sometimes salts are added for the purpose of increasing the colour and amount of extractive; consequently, it is necessary to estimate the amount of ash. These three tests together will, I think, be a pretty good guide to the judgment as to the quality and purity of the article. I have been unable to obtain sufficient samples to make a long table, but the following, I think, are sufficient to show the value of the plan I suggest.

I may add that the decoction has always a strongly acid reaction, and effervesces with carbonates.

No.	Specific gravity.	Extract in 1 fl. oz.	Ash in ditto.
1	1·055	64 grs.	10 grs.
2		57 „	9·7 „
3	1·027	50 „	9·0 „
4	1·034	52 „	9·5 „
5	1·017	33 „	7·5 „
6	1·049	67 „	13·7 „
7	1·048	64 „	The amount of ash not taken, the experiment being made before this paper was contemplated.
8	1·048	75 „	
9	1·010	34 „	

Bradford.

The President spoke as to the difficulty of obtaining the extract in a uniform state of dryness.

A Member stated that common salt was used by some makers to preserve the essence and to reduce the amount of spirit.

Mr. Groves (Weymouth) had found the deposit formed in the compound decoction to consist mainly of a compound of glycyrrhizin with acetic acid.

Wednesday, September 14th.

The Conference reassembled at 10 A.M. The spacious Lecture Theatre of the Royal Institution again exhibited a numerous attendance throughout the day.

At the commencement of the proceedings, Professor Attfield announced that an answer had been received from the American Pharmaceutical Association, in conference at Baltimore, to the telegram sent on Tuesday evening across the Atlantic from the Adelphi Hotel. It was as follows:—"From Professor Maisch, Baltimore, to Secretary of Pharmaceutical Conference, Liverpool. —Fraternal greeting of American Pharmaceutical Association."

After the transaction of the usual business, the following paper, an abstract of which is given, was read.

A Century of Old Books Relating to Pharmacy and Kindred Subjects.

BY JOSEPH INCE

Member of the Royal Society of Literature.

The design was to exhibit one hundred volumes illustrative of the Pharmacy of the fifteenth and sixteenth centuries. Some of these were of great rarity and excellence—the object contemplated will best be explained by the preface which we subjoin.

A few rare old books are here presented for inspection. I have to thank those who have so largely contributed from their stores, and also to acknowledge the skill and promptness with which the descriptive writers have executed their task. This collection was begun, finished, catalogued, and on its way to Liverpool, within the space of one month. It is hoped that a great town such as this manufacturing centre, with its trade activity and its wonderful mercantile intelligence, will not disdain to read these records of the past. Some possess special interest, such as Gerard's 'Herbal,' remarkable for noble type and quaint illustrations, which at this moment are copied by modern artists; Prosper Alpinus, the Secrets of Alexis, Pomet, and many others. I regret exceedingly for the sake of the members of the Conference that I have had to stand alone, and that I have been deprived of the aid of one whose power of accurate analysis, lit up by a graceful fancy, would have lent an added charm to these pages. Accept them as an earnest of goodwill; they have received as much care as other pressing occupations and anxieties would permit. It is right sometimes to live in centuries not our own; and as men trace out the sources of the Nile, so we may take pleasure in learning the springs from which our present information has been derived. To study these productions is to love them. No man ever yet could decipher a black letter in the spirit of a fossil. None can hold converse with the great dead, and have a mean, ignoble mind; and these ancient tomes hold in their hands the gift of *rest.* I would fain say one other thing. Should any writer wish to escape feebleness of style, and gain manliness of expression, let him become, first, a diligent student of the Bible, specially of Isaiah, the authorized translation of which is the grandest rendering of the English language extant. Secondly, let him be a reverent admirer of men, the composition of whose works has been and will remain a constant theme of admiration. I congratulate whoever he may be to whom this exhibition may prove his first introduction to a literature much of which seems inspired. What can exceed in stateliness or beauty *the* dedication to King James? What can surpass many sentences which these recondite treatises contain? This statement is not upset by knowing that several have no other recommendation than the date they bear. This class of research moreover may induce a healthy dissatisfaction with ourselves; for while chemistry has advanced with giant steps, and botany has shaped itself into a definite science, and is excellently taught, I entertain the heterodox belief that we have altered many things in Pharmacy without improvement. After which dreadful declaration I fall back on Francis Lord Bacon (1597):—

"Reading maketh a full man; conference a ready man; and writing an exact man. And, therefore, if a man write little, he had need have a great memory; if he confer little, he had need have a present wit; and if he read little, he had need have much cunning to seem to know that which he doth not."

The chief contributions were received from Provincial Associations and Pharmacists: the collection of the Pharmaceutical Society was included, while a few private gentlemen sent valuable additions.

It is obvious that books forwarded without description would fail to be of service; eight writers therefore united to supply explanatory notes.

There was a certain man having great authority, for he had the command of all the treasures in Ethiopia, and he lived in the reign of Candace. Riding in his chariot he read. A strange thing, for it was an age when common people read seldom and dignitaries almost never. "Understandest thou what thou readest?" was the question. "How can I, except some man should guide me?" was the answer.

The annotators were, James Collins, Daniel Hanbury, A. F. Haselden, F. T. Marzials, John Moss, Richard Reynolds, W. A. Tilden and Joseph Ince.

The chief object of interest was the collection lent by Daniel Hanbury which was the one shown during the reading of the paper at Liverpool. We quote his own remarks on the following books:—

Pomet.—Histoire Générale des Drogues, traitant des Plantes, des Animaux et des Minéraux, Ouvrage enrichy de plus de quatre cent Figures en Taille-douce tirées d'après Nature; avec un discours qui explique leurs différens Noms, les pays d'où elles viennent, la manière de connoître les véritables d'avec les falsifiées, et leurs proprietez, où l'on découvre l'erreur des Anciens et des Modernes; le tout très utile au public. Par le Sieur Pierre Pomet, Marchand Epicier et Droguiste. Paris, 1694. *fol.*

No work of its class has enjoyed a more deserved and extensive reputation than Pomet's History of Drugs.

Here is the first edition published in Paris in 1694, at which period Pomet was keeping a shop in the Rue des Lombards, the great drug-street of that capital, as his advertisement at the end of the volume makes manifest. But what a marvellous contrast is a *History of Drugs* in the seventeenth century to the *Manual of Materia Medica* which suffices for the nineteenth! Would any modern student have the courage to sit down to the perusal of the stately folio of 528 pages, illustrated by 400 engravings? To speak seriously Pomet's book is of great utility and excellence, not so much by reason of its erudition and research, as on account of the information which the author gives as the result of his own observation and experience. Although it is profusely illustrated by engravings which must have been produced at no small cost, the figures are often poor and spiritless, and in some instances entirely imaginary, thus contrasting unfavourably with the rude but life-like wood-cuts of Brunfels published a century and a half before.

Monardes (Nicolaus). Historia de las Cosas que se traen de nuestras Indias Occidentales que sirven en Medicina. Sevilla, 1574. 4°.

The writer who first gave to Europe an account of the more useful plants and vegetable products discovered by the Spanish adventurers in the New World was Dr. Monardes, a physician of Seville, who in 1569 published a small volume under the above title. Other editions of this work were printed in 1571 and 1580. In 1596 an English version made by one Frampton was published as "*Joyfull Newes out of the New-found Worlde*;" the work also appeared in French, the translator being Antoine Colin, Maistre Apoticaire Juré de la ville de Lyon, and in Italian. Better known than the original Spanish or than the English, French or Italian translations, is the excellent Latin version included in the *Libri Exoticorum* of the learned Clusius, which appeared in 1605.

Monardes never visited America, but derived his information and specimens from the navigators and explorers who were doubtless at that period frequently arriving at Seville. Among the drugs he describes are Copal, Anime, Liquidambar, Balsam, Guaiacum, Sarsaparilla, Tobacco (of which there is a woodcut), Sassafras, Coca Leaves and Cevadilla, besides many which now find no application in Europe. Of this latter class is *Nephritic Wood*, a substance the origin of which is still entirely unknown; it is remarkable for its aqueous infusion exhibiting a beautiful blue layer on the surface (like a solution of quinine), a fact which Monardes did not fail to observe.

Hieronymus Brunschwyg on the Art of Distillation.

A work of which there are numberless editions, including an English version printed in Southwark in 1525 and entitled *Noble Experience of the Virtuous Handywork of Surgery—and of Distillation*. The present edition appeared at Strasburg in 1515; appended to it, is the *Book of Life of Marsilius Ficinus, the Florentine*, which contains curious representations of mediæval herb gardens, an apothecary's shop, laboratory, studio, besides various scenes of domestic life. The volume has been much mutilated, but it is of interest as having belonged to Philip Melancthon, in whose hand it is probable are some of the manuscript notes on the fly-leaves at the end.

Prosperi Alpini de Plantis Aegypti Liber. Venetiis. 1592. 4o.

Prosper Alpinus, a celebrated physician and professor at Padua visited Egypt between the years 1580 and 1584, publishing on his return several works bearing upon medicine. One of these is a small volume on the plants of Egypt, in which the author describes and figures various useful trees, shrubs and herbs, at that day but little known. Among the number are Cassia Fistula, the Sycomore Fig, Date, Palm, Tamarind, Cotton and Sesamum. The first edition of this book appeared in 1591; the second published at Venice in 1592, is that herewith.

(*To be continued.*)

Obituary.

We regret having to record the death of Dr. William Allen Miller, one of the honorary members of the Pharmaceutical Society, on the 30th September. He was born at Ipswich on December 17th, 1817.

After having been assistant to the late Mr. Daniell, he succeeded him as professor of chemistry at King's College in 1845. In the same year he was elected a Fellow of the Royal Society. In later years he became Treasurer and one of the Vice-Presidents of the Royal Society. In 1851, he was appointed one of the assayers to the Mint. He was one of the members of the recently appointed Royal Commission to inquire into the condition of science in this country. He was one of the Vice-Presidents of the Chemical Society, having occupied the President's chair.

His best known work is his textbook on 'Chemistry,' originally published in the years 1855 and 1857. His first scientific publication was a 'Research on the Electrolysis of Secondary Compounds' (1844). This research was done conjointly with Mr. Daniell.

In 1845, he published a paper on the spectra of heated vapours. In 1849, he wrote on the atomic volumes of analogous organic liquids.

Within the last few years he has given a discourse to the Chemical Society on the "Analysis of Potable Water." Some analyses of gutta percha, and a paper on "Transparency," complete the list. He joined Mr. Higgins in the investigation of the spectra of the fixed stars.

The following journals have been received:—The 'British Medical Journal,' Oct. 1; the 'Medical Times and Gazette,' Oct. 1; the 'Lancet,' Oct. 1; 'Nature,' Sept. 29; the 'Chemical News,' Sept. 30; 'Journal of the Society of Arts,' Sept. 29; 'Gardeners' Chronicle,' Oct. 1; the 'Grocer,' Oct. 1; the 'English Mechanic,' Sept. 30; the 'Produce Markets Review,' Oct. 1; the 'Practitioner' for October; the 'Food Journal' for October; 'Journal de Pharmacie et de Chimie' for July; 'Gazette Médicale d'Orient' for July and August; the 'Journal of Applied Science' for October; the 'Educational Times' for October; the 'Quarterly Journal of Microscopical Science' for October; the 'Philadelphia Medical and Surgical Reporter,' Nos. 703–705.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

POISON REGULATIONS.

Sir,—I have watched with considerable interest the expression of various opinions in your correspondence columns, relative to the best method of keeping and dispensing poisons.

Whatever may be the result of the present discussion, our greatest security against the improper administration of poisons will be the proper education and training of all who sell and dispense them, and I should prefer that our efforts be restricted to securing this, leaving each individual to adopt those precautions which his particular class of business rendered desirable. But as it appears that we are expected to do something more, it is well to consider what features must necessarily be included in any system of regulations to fit it for general adoption.

Any plan, to be effective, must be extremely simple and capable of being easily worked. Anything of a complicated character would promise infinitely more danger than safety. It is frequently overlooked that many of the plans proposed would require as great care and attention to secure their observance as would almost suffice, in the first instance, to guard against the possibility of error, thus working for one object twice over.

Viewed in the light of the preceding remarks, I think some of the proposed schemes are very unsuitable. Distinctive stoppers, caps, etc., are useful to a very limited extent. In the hurry of a busy day too much care and attention would be required to ensure the proper use of them, and there would also be the chance of some being applied to the wrong bottles. Distinguishing the bottle itself, by making it a peculiar shape, or by distinctive labelling, appears to me a much better idea, and would doubtless be of great service, though the use of peculiar-shaped bottles in dispensing for lotions, liniments, etc., is rendered less valuable than it would otherwise be by the liability of their being used for general purposes afterwards. While on this point, I must say that in spite of the immunity from accident which appears to have attended one of your correspondents' (Mr. Mumbray's) systems of labelling, I should hesitate to keep such articles as tinct. opii, tinct. aconiti, and acidum arseniosum in the situation he describes, however labelled. The system of labelling suggested by Mr. B. S. Proctor seems unnecessarily complicated. Keeping dangerous articles in one particular place, such as a cupboard, is a precaution which, I think, should never be neglected, though the articles so treated would depend, in some degree, upon the class of business done.

The system adopted in the establishment where I was apprenticed, which was found to answer very satisfactorily, and which I have in operation in my own shop, is as follows:— Care is taken that all articles of a dangerous character are distinctly labelled "Poison." Articles of a dangerous character, likely to be mistaken for innocent substances, and also otto of roses, rare essential oils, chemicals, etc., and articles generally in the handling of which it is desirable that extra care should be taken, are kept in cupboards. Exceptionally dangerous articles, such as acid. hydrocyanic. dil., are additionally protected by the use of peculiarly-shaped bottles or otherwise.

I would suggest that the Council, instead of the regulations proposed at the last annual meeting, next year submit something of the following character:—

1. All boxes, bottles, vessels or packages containing poisons shall be distinctly labelled with the word "Poison;" and, if practicable, shall be otherwise distinguished from similar receptacles for innocent substances.
2. All poisonous substances of a character likely to be mistaken for innocent articles shall be kept apart in a place provided for the purpose.

These regulations (if they are stringent and definite enough to deserve the name) appear to me to do as much in the way of providing security for the public as is likely to be effected by any other system of regulations. They are simple and not too stringent, can therefore be varied in character to a slight extent to suit the requirements of different businesses, and for these reasons their adoption would be probable. They comprise as much as would be generally carried into effect of the most stringent set of rules which are likely to be proposed, unless we are prepared for a system of close inspection, which at present, I presume, is not contemplated.

I am, Sir, yours respectfully,

A. H. BUCKETT.

PHARMACY AND MEDICAL PRACTITIONERS.

Sir,—A letter from "Reformer" in the *Lancet* of the 17th ult., is made the subject of a leader, headed "Pharmacy and Medical Practitioners." "Reformer" complains of the extent to which druggists prescribe, and says, "Nearly every patient the medical man is sent to, he finds has been doctored by this dignitary (the chemist) first, and, therefore, he guesses it is a bad case. I, myself, the other day was standing in one of the shops, and was greatly amused at seeing the people, one after another, come in to be doctored, the druggist actually, in my presence, feeling their pulses," etc. Then "Reformer" suggests, in order "to put a stop to this sort of thing," that

(1) A clause should be inserted in the Medical Bill before Parliament, and

(2) "That general practitioners should supply their own medicines as in former days (which is certainly very *infra dig.*) and thus wrench back from druggists that of which evidently they are depriving the profession."

Upon this amusing, yet frightful picture of pharmaceutical morals in ye nineteenth century, the editor builds an article, the sum of which is that the "monstrously excessive profits" of the chemist ought to be lessened in order that the public may be better able to pay the doctor. He begins, of course, with "the time of Hippocrates," "the Roman Empire," etc., rushes through the middle ages in half-a-dozen lines, and finds himself face to face with the modern medical practitioner, "who wishes to be liberated from care about mere drugs, to whom the notion of making remuneration depend on the amount of medicine supplied is abhorrent, and who wishes to be paid for his opinion." But "there are difficulties and obstacles and serious objections to such arrangements." What are they? Mr. Editor supplies us with one only, that is, the high prices charged by chemists. He says, "Mixtures are 1*s.* 8*d.* or 2*s.* apiece; an ordinary prescription easily costs 2*s.* 6*d.* or 3*s.*; people find their drug bill equal to the doctor's, and the fact of paying as much to the man who dispenses a prescription as to the man who writes it, is a *reductio ad absurdum.* Moreover, the chemist is paid at once; the doctor only after months or not at all; and there is no hope for better days till chemists have shown how patients can be supplied sufficiently and satisfactorily at prices which do not inconvenience them or impair their ability to pay their doctor!"

I need not waste your space in inquiring if these statements be correct. The experience of your readers will supply the answer. It will say that a skilled and scientific workman, who gets 2*s.* for a 6-ounce mixture and 12 pills, which have taken 20 or 30 minutes of his time and 1*s.* worth of his stock, is badly paid; it will say that he would scarcely make a living if he worked from morning till night at this rate; it will say that competition and co-operation and dispensaries prevent his being paid after even this humble manner in poor districts, and that in rich ones the doctor gets his guinea, and the chemist 1*s.* 6*d.* for a bottle of concentrated drops to last the patient a week. It would indeed speak little for the faculty, if "Reformer's" tale were true of every Pharmacy in the kingdom, instead of less than 5 per cent. of them. Further, the remedy of the *Lancet, i.e.* reduction of prices, would most likely increase, instead of curing the disease of which "Reformer" complains, because the "dignitaries" would then be more consulted than ever. The gist of "Reformer's" argument is that we fill our shops by charging so little; Mr. Editor's is, that we beggar the profession by charging so much. Pray, Sir, show us how we may avoid Scylla and not run into Charybdis; and, as the *Lancet* is bent on demonstrating "the evils of the system of transferring the business of dispensing to chemists," supply us with a mild counterblast.

Yours obediently,

MAX.

Sir,—The following extract from the *Lancet* has embodied what I have often thought myself, and I have carefully reflected on the subject, and have consequently taken at times very different views of the matter:—

"One great objection to practitioners handing over the dispensing of their medicines to chemists is to be found in the high prices charged by chemists for medicines. These prices are such as to be of themselves a heavy and exhausting bill to people of humble means. Mixtures are charged at the rate of 1*s.* 8*d.* or 2*s.* apiece, and other medicines correspondingly, so that the dispensing of an ordinary prescription easily costs 2*s.* 6*d.* or 3*s.* People whose family doctor does not supply them with medicines find that their drug bill is equal to or even exceeds the doctor's bill. Now this appears to us quite unreasonable. The percentage of profit to the chemist is monstrously excessive, allowing for all the incidental expenses of his business. And the fact of paying as much to the man who dispenses a prescription as to the man who writes it is a complete want of distinction between two very distinct services, and a *reductio ad absurdum.* But this is not all. The chemist is paid at once over the counter, in the full urgency of the want of the patient. The doctor is probably not paid for months, when the chance of being paid at all is greatly reduced. It is hopeless to think of medical practitioners giving up the dispensing of their own prescriptions until chemists have shown them how patients can be supplied sufficiently and satisfactorily with drugs at prices which do not inconvenience them, and do not impair their ability to pay their doctor."

It seems a most extraordinary fact that a chemist in one part of town should charge as much for preparing a prescription as a licensed apothecary or medical practitioner should charge for both visit and medicine, in another. The doctors are a most generous race; we must be friendly with them, for they are our best friends; and if our journals are going to bicker, the sooner a better spirit is imparted into the controversy the better for us all.

George Mee.

79, Grosvenor Road, Highbury, N.

Sir,—The article in the *Lancet* contains statements so incorrect and an argument so utterly false, as to deserve some notice. The writer must be grossly ignorant of chemists' business, or he would have known that instead of cash payments, one, two and three years' credit is more the rule than the exception; and that the practitioner who obtains his fee for prescribing orders ingredients and quantities very different from those he would use if he prepared the medicines himself. I have now dispensed the following from a general practitioner:—

℞. Quinæ Disulph.,
Ferri Sulph., aa gr. xx
Acid. Sulph. Dil. ʒiij
Sp. Chloroform. ʒij
Sp. Æther. Nit. ʒvj
Aquæ ad ℥viij
f. Mist. Cap. coch. j medium c. aquâ ter die.

The profit on this, at 1*s.* 8*d.* or 2*s.*, would certainly not be "monstrously excessive;" but it would be a very extraordinary occurrence to find any private surgery sending out such a medicine at all. The writers think it absurd that the inferior, who dispenses the deadly compound ordered by a practitioner, should receive as much in payment, and imply that if the chemist is paid for the ingredients, he has no right to look for any remuneration for his skill, care or time. I have two prescriptions before me now in preparation, and I can see nothing at all absurd in supposing my responsibility for the accuracy of these formulæ should be repaid in a different manner, and at a higher price than for merely rolling out soap and bread-crumbs for a surgeon's private practice:—

℞. Strychniæ gr. i
Acid. Phosph. Dil. ʒij
Aquæ Destill. ʒiv
Sol. Strychnia.
Sol. Strychniæ ʒv
Acid. Hydroyanic. Dil. ʒiss
Aquæ ʒi.
Take 15 drops three times a day with meals.

℞. Ext. Colchici ʒi
Strychniæ gr. i
Ext. Aconiti gr. vj
Acid. Arseniosi gr. ij.
Fiat pilulæ xx. 1 pill three times a day after food.
Silvered.

J. H.

If medical men find it necessary to give such concentrated forms for the good of their patients, they should remember that much of the success attending their *experiments* depends upon the dispenser, and that he is deserving of a higher reward than the mere profit on the articles used. If, as the writer argues, it is hopeless to expect practitioners to give up dispensing their own medicine, so is it equally futile to expect chemists to discontinue to prescribe in such a manner as not to inconvenience those who seek their advice instead of paying the doctor.

I am, Sir, your obedient servant,
John Wade.

Hospital Dispensing.

Dear Sir,—Having been engaged in hospital dispensing nearly five years, I can most fully endorse all that Mr. Barber says on the subject.

In reply to "A Pharmacist," I would say I do not think that the case he mentions is an "average type of hospital dispensing," or "a waste of public money;" at least, it is not a type of mine or that of six other hospitals I am acquainted with. It is true a public dispenser is compelled to be as quick as possible, and therefore he could not waste his and the patient's time (who, perhaps, has been waiting his or her turn to see the doctor for two or three hours) by asking for bottles as politely as a chemist would ask a customer when no one else is waiting to be served.

Of course I do not justify the giving of corks and labels to the patients themselves to put on any kind of bottle, for that is the dispenser's work and not the patient's. My own plan of dispensing (*i. e.* with regard to bottles and labels) is—

First, to have a large notice posted in the waiting-room to the effect that "no medicines, etc., will be dispensed in any bottles which have been used for domestic purposes, such as wine, beer and spirit bottles, etc. Proper medicine bottles may be bought in the dispensary." So that patients may bring their own bottles or buy them at any shop just as they choose; but, to save time, and as a convenience to them, I keep a stock of bottles, which they are generally very glad to get.

Secondly, I use labels printed in bold type, with the name of the institution at the top, and labels so plain can be read by most patients if they are only able to spell.

With such precautions I have only heard of one mistake, and that was by a woman who went to her cupboard in the *dark*, and drank from a "lotion bottle" without measuring the dose. Happily no harm resulted.

I am, Sir, yours obediently,
Wm. Billing Orton, A.P.S.

Manchester, Sept. 24th, 1870.

Chloral Hydrate.

Sir,—I should esteem it a favour if any of your scientific correspondents could inform me, through the medium of your Journal, what are the principal incompatibles of chloral hydrate.

F. B.

"*Consternatio*" says:—"In answer to the inquiry by 'Spes' in last week's Journal, as to what 'acids, oxides and salts' are 'compounds' (a description of which is required in the Minor Examinations on Chemistry), I think that I should be right in suggesting acid. nitro-hydrochlor. dil. and acid. sulphuric. arom. as "compound" acids, and soda tartarata, alumen, antim. tartaratum, and ferri et quiniæ citras as 'compound' salts."

T. G. R. (Worthing).—As the new notation is that which is now most generally used, it is necessary for students to become acquainted with it. But the present being a time of transition from the use of one system to another, a knowledge of the old notation is also requisite.

Au Revoir.—A very full knowledge of formulæ is required.

T. L. (Strood) asks, "Would any brother apprentice inform me where I could obtain a map of Gaul (temp. Julii Cæsaris) without buying another work."

C. W. Brown (Plymouth.)—The liquor potassæ permanganatis of the Pharmacopœia should contain four grains of permanganate of potash to the ounce; this, it will be seen by reference to a recent estimation published in our columns, is half the strength of Condy's fluid.

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

NEW METHOD OF DETERMINING GRAPE SUGAR.

BY CARL KNAPP.

Professor Liebig has mentioned the fact that the addition of prussic acid to a mixture of yeast-water with a solution of cane sugar does not prevent the conversion of cane sugar into grape sugar by the organic substance in the yeast-water. After saturating such a mixture with oxide of mercury, adding caustic soda, and heating the liquid to boiling, a precipitate of metallic mercury is formed, but no such precipitate is formed under the same conditions in a solution of cane sugar mixed with an alkaline solution of cyanide of mercury.

Further experiments showed that an alkaline solution of cyanide of mercury is completely reduced to metallic mercury by grape sugar, and at the suggestion of Professor Liebig the author of the paper undertook to apply this reaction for the determination of grape sugar. He now gives, as the result of his inquiry, the following method:—

A solution is made by dissolving 10 grams pure dry cyanide of mercury, adding 100 c. c. caustic soda solution of 1·145 sp. gr. and diluting to 1000 c. c.

For determining the value of this solution, commercial grape sugar was first dried at 100° C., then boiled with absolute alcohol till a saturated solution was obtained; the crystals which separated on cooling this solution were taken for use.

A series of experiments showed that 400 milligrams of cyanide of mercury is decomposed by 100 milligrams of anhydrous grape sugar, on boiling them together in an alkaline solution.

The sugar determination by this method is conducted just as in the Fehling test: 40 c. c. of the cyanide solution is heated to boiling in a porcelain dish, and the sugar solution, containing about 0·5 per cent., added until the whole of the mercury is reduced. The quantity of sugar solution required for effecting this reduction will contain 100 milligrams grape sugar.

On adding the sugar solution to the boiling alkaline liquid, a turbidity is at once produced, but this disappears again towards the end of the operation, and the liquid becomes slightly yellowish.

In order to judge of the progress of the operation, a drop of the liquid is from time to time placed on fine Swedish filter-paper laid over a beaker containing a little strong sulphide of ammonium. So long as any cyanide of mercury remains undecomposed in the liquid, a brown spot is thus produced upon the paper, and the end of the reaction is indicated when such a spot is no longer produced in this way. This point may be ascertained much more sharply by holding a drop of sulphide of ammonium on a glass rod immediately over the paper moistened with a drop of the liquid being operated on.

At first the entire spot becomes brown, but when the reaction is nearly terminated, only a pale brown ring appears round the edge of the spot; afterwards that is to be recognized only when the paper is held up to the light, and at last the spot remains quite unaltered. With some practice, ½ per cent. solution of grape sugar can be titrated up to ·1 c. c.

If at the end of the reaction the spot be allowed to dry on the paper, a pale brown ring of sulphide of mercury always makes its appearance, inasmuch as the solution always contains a trace of grape sugar and a trace of cyanide of mercury, either of which is to be removed only by an excess of the other substance. This circumstance, however, does not interfere with the delicacy of the test, provided the coloration of the fresh spot be taken as the indication when the reaction is completed.

From a large number of experiments in which this method was adopted and compared with Fehling's test, the author has convinced himself that it is not inferior to the latter in accuracy, and though the results it furnishes are not better than those obtained by Fehling's method, there is an advantage in the new method requiring less time for making a determination, and a further advantage in the fact that the reduction of cyanide of mercury is not affected by foreign substances, such as alkaloids, which in some cases interfere with the colour of the suboxide of copper precipitate. But perhaps the chief advantage of the new method lies in the easy preparation of the standard solution and its capability of being kept without alteration.—*Annalen der Chemie und Pharmacie.*

HYDROBROMATES OF QUININE AND CINCHONINE.

BY M. LATOUR.

The successful use of bromide of potassium in affections of the nervous system, and the association of this salt with sulphate of quinine, as well as other alkaloids, induced the author to prepare hydrobromate of quinine, in the belief that it might be useful as a medicine.

The hydrobromates of quinine and cinchonine were prepared by double decomposition of bromide of potassium and the sulphates of the alkaloids, as follows:—

Neutral Hydrobromate of Quinine.

Basic sulphate of quinine . .	10	grams.
Alcohol of 85°	50	,,
Bromide of potassium	8	,,
Distilled water	20	,,
Dilute sulphuric acid (1 per cent.)	10	,,

The sulphate of quinine and the alcohol are heated together in a small flask; the solution of bromide, mixed with dilute sulphuric acid, is then added, and the whole heated to boiling. After a few minutes the sulphate of potash is separated by filtration, and washed with hot alcohol. The filtration and washings are then evaporated to half the volume, and left to crystallize. After twenty-four hours an abundant crop of crystals was formed, and, when pressed between filter-paper, the salt was white, opaque, of a pearly appearance. The salt thus obtained is sufficiently pure for use, though it contains traces of sulphuric acid.

The proportion of bromide of potassium used must be rather more than equivalent to the sulphate of quinine, otherwise a mixture of basic and neutral hydrobromate is produced. It is also necessary to add sulphuric acid, in order to make the quinine sufficiently soluble, as well as to decompose a portion of the bromide of potassium, so as to produce hydrobromic acid, necessary for forming a neutral salt with the quinine.

Basic Hydrobromate of Quinine.—This salt was prepared in the same way, but only 5 grams of bromide of potassium were used, together with 10 grams of dilute sulphuric acid. A better plan is to dissolve 1 gram of the neutral salt in 10 grams of a mixture of alcohol and water in equal parts. This solution, heated to 70° C., is mixed with very dilute ammonia solution, until it acquires a slight alkaline reaction, and then mixed with a solution of 0·5 gram neutral hydrobromate of quinine, shaking the whole until it becomes cold: a copious precipitate is then formed, consisting of basic hydrobromate.

The neutral salt is very soluble in water, soluble in almost all proportions in alcohol, and its reaction is acid. The basic salt is sensibly soluble in water, very soluble in alcohol, and its reaction is alkaline.

The hydrobromates of cinchonine are prepared in a similar manner. The neutral salt corresponds to the hydrochlorate; it is anhydrous, very soluble in water, and less soluble in alcohol than the corresponding salt of quinine. Its solution has an acid reaction. The basic salt is sensibly soluble in water, very soluble in alcohol, and its solution has an alkaline reaction.—*Journ. de Pharmacie et de Chimie.*

REPORT ON OPIUM PRODUCTION IN WÜRTEMBERG.

BY JULIUS JOBST.

The author states in this report the results of this year as follow:—

Though large quantities of poppies were sown last spring, the crop rarely did well in consequence of the continued dry weather. This alone put an end to any prospect of considerable development in opium cultivation for the present year, and the scarcity of labourers at the time of gathering was for a time a further hindrance. Subsequently, when the influence of the war had driven many to this work, the best time for collection was past, and the poppies ripened too quickly, owing to the great heat.

On the contrary, the price of the new Asiatic opium admitted of the best Würtemberg opium fetching as much as 34*s.* per pound. At this price the earnings of a labourer would amount to 2*s.* 6*d.* a day, which is good, considering that old men, women and children could be employed for the purpose.

The opium of this year is much superior to that previously grown. The amount of morphia it contains is 12 per cent., even in samples that are somewhat moist.—*Gewerbeblatt aus Würtemberg.*

COLOPHONINE AND COLOPHONIC HYDRATE.*

BY CHARLES R. C. TICHBORNE, M.R.I.A., F.C.S.

When we submit to distillation (either with or without water) the natural exudations of the different pines, the first result is the extraction of volatile hydrocarbons, or oils of turpentine. These oils were until very lately considered as identical, but recent investigations have proved that there is a considerable disparity in the products from different species of the pines.

If, after the extraction of the volatile oils, the distillation is pushed further, we get a second series of volatile compounds, which, however, differ materially from the first, inasmuch as they are decomposition-products resulting from the splitting up of the colophony, or resinous part, into more simple molecules of different isomeric modifications.

All the resin oils obtained by myself gave the result I am now about to detail. I, however, believe that the discrepancies exhibited by the turpentines are perpetuated through the products obtainable upon the destructive distillation of the resins proper to such turpentines.

My attention was first directed to the substance which I have named colophonine from an observation made preparatory to investigating the volatile oils procured on submitting resin to destructive distillation.

I took commercial rosin, and after drying for some time at a slightly elevated temperature distilled it in an iron retort. I got by this means a thick distillate, which contained a considerable quantity of undecomposed resin. Gaseous products escaped which are said to contain ethylene, tetrylene and marsh gas. The liquid products amounted to about 74 per cent. of the resin employed, and a small coke was left in the retort. This thick oil, on rectification, gave about 5 to 6 per cent. of a light yellow but mobile fluid, which is known under the names of "resin spirit," "vive essence," Harzessenz."*

This lighter portion, or "resin spirit," is supposed to consist mainly of the hydrocarbons homologous of the series C_nH_{2n-4} and C_nH_{2n-6}, and and oxygenated oil which has been named colophonone.† It is these light oils that yield colophonic hydrate. They act energetically upon the fluid alloy of potassium and sodium, even when free from the last-named substance; therefore it is probable that colophonone or other oxygenated oils form a large ingredient.

It is given as a specific characteristic of colophonone, that if it is treated with sulphuric or hydrochloric acid a green oil separates on the addition of water. This is, however, only partially true, for I have found that the "resin spirit,"‡ procured in the above experiment, or old resin spirit that had been washed, only gave this reaction in a slight degree.

It was therefore evident that the colour-phenomenon was due to the presence of some other substance soluble in water, and not to a specific property of the colophonone. On treating old resin spirit with distilled water two or three times, and on evaporating these washings at a low temperature, a brown crystalline mass was procured, which gave the colour-reactions, hitherto attributed to the oil itself, in a most vivid manner. It therefore becomes evident that the whole subject of colophonone requires revision. It was probable that the substance analysed under that name was a mixture.

I subsequently obtained specimens of the new substance in which individual crystals had attained some considerable magnitude.

Some of them were three centimetres long and over two grammes in weight. They were of an amber colour, from impurities, and were obtained by submitting a large volume (10 litres) of the spirit in an imperfectly-closed vessel to 12 months' slow evaporation and oxidation. I have procured as much as 281 grammes of the crude crystals from 4–5 litres of resin spirit by washing.

The following are the characteristics of this compound, which, when purified, is a truly beautiful substance:—

Colophonic hydrate is white, perfectly odourless, and has a sweetish taste. It is very soluble in water, alcohol, ether, chloroform and tetrachloride of carbon, not quite so soluble in cold benzole and resin spirit, but slightly soluble in cold bisulphide of carbon.

Colophonic hydrate crystallizes readily from water or

* Read before the Royal Irish Academy.

* Mr. J. Turner, a large distiller of resin, has kindly sent me the following notes regarding the statistics of the production of these oils on a manufacturing scale:—

	Percentage.
"Resin spirit" (boiling at 135° C.)	5–3
Heavy oils	64–6
Pitch	14·4
Gaseous products and H_2O	15–7

† Schiel.

‡ I shall use the term "resin spirit" throughout this paper to designate the oils got on rectifying resin oils.

alcohol in beautiful acicular prisms, which sometimes attain some magnitude. Heated, it melts and sublimes with a partial loss of the elements of water. The crystals which first sublime lose water, but nearly resemble those obtained from a solution, both as regards their appearance and composition. Those which afterwards rise (or, if the first, are resublimed) lose more water and form hexagonal plates, or fern-like fronds, of great beauty. It was found impossible to accurately measure the large crystals already mentioned, the twelve months' immersion having rounded and worn the faces, from the rise and fall of temperature in the medium in which they were formed. They seem to belong to the dimetric system, and are the result of the combination of the two prisms of that system.

The hydrated crystals, when placed over sulphuric acid, or *in vacuo*, gradually lose water and effloresce, but as the substance is itself volatile, the loss could not be measured under such circumstances. When placed under a bell-glass over sulphuric acid, the surface of the acid becomes covered with green film, produced, as will afterwards be explained, by the mutual action of the water, sulphuric acid and colophonic hydrate. Some difficulty was experienced in procuring the anhydrous compound. From the above results it was supposed that, on submitting the hydrate to sublimation, the water of hydration would be dissociated. Such, however, was not the case, and a combustion of the sublimed crystals pointed to no formula. The sublimate was, in fact, a mixture of the anhydrous and hydrated compounds.

The first of these substances I obtained in the following manner:—I gently fused in a test-tube for some time the crystals obtained from an aqueous solution, occasionally drying out the moisture which condensed at the top of the tube with bibulous paper. The sublimated crystals were repeatedly broken down and mixed with the fused mass. This process was continued as long as moisture was given off. I retained the crystalline mass for analysis. It seemed to have suffered no decomposition exclusive of dehydration, and formed a friable and nearly perfectly white substance.

On making a combustion of the above, 0·218 gramme gave 0·505 gramme CO_2 and 0·218 gramme H_2O.

In a second experiment 0·307 gramme of the fused mass gave 0·7076 gramme of CO_2, and 0·324 gramme of H_2O.

These experiments point to the empirical formula $C_{10}H_{22}O_3$.

	1	2	Theory.	
Carbon . .	63·16	62·86	63·15	120
Hydrogen .	11·10	11·72	11·58	22
Oxygen . .			25·27	48
			100·00	190

The crystals obtained from an aqueous solution gave when burnt the following results: 0·265 gramme of crystals produced 0·557 gramme of CO_2, and 0·270 gramme of H_2O.

		Theory.	
Carbon . . .	57·35	57·70	120
Hydrogen . .	11·32	11·53	24
Oxygen . . .		30·77	64
		100·00	208

Colophonic hydrate . $C_{10}H_{22}O_3 : H_2O$.
Colophonine . . . . $C_{10}H_{22}O_3$.

Colophonine is, therefore, isomeric with terpine hydrate, or is more properly a homologue of terpine. It is another instalment towards filling up an interesting series. This compound is probably derived from terebene.

Hydrocarbides.	Products formed therefrom by the occult molecule H_2O ("Turpentine Camphors.")	Hydrates.
$C_{10}H_{16}$, $C_{10}H_{16}$. ("Diterebene.")	$C_{10}H_{16}$, $C_{10}H_{16}$; H_2O.* ("Terpinole.")	
$C_{10}H_{16}$. (*a*) (Turpentine, or "terebinthene.")	$C_{10}H_{16}$; H_2O. ("Liq. Turpentine Camphor.")	$C_{10}H_{16}$; H_2O : H_2O. (Hypothetical hydrate, supposed transition products.)
	$C_{10}H_{16}$; $2H_2O$. ("Terpine.")	$C_{10}H_{16}$; $2H_2O$: H_2O. (Terpine hydrate.)
$C_{10}H_{16}$. (B) ("Terebene.")	$C_{10}H_{16}$; $3H_2O$. (Colophonine.)	$C_{10}H_{16}$; $3H_2O$: H_2O. (Colophonic hydrate.)

$$-2(C_2H_4O_2) - \left.\begin{matrix} C_2H_3O \\ C_2H_3O \end{matrix}\right\} O = \underset{\text{(Terpinole.)}}{C_{20}H_{34}O.}$$ —*Vide* Naquet's 'Principles,' p. 396.

In the above table I have endeavoured to convey, by the punctuation, the accretion of the series, and the different degrees of molecular integration.

It will be observed that each hydrate would be isomeric with the next higher homologue in the camphor series. The hydrates to the first two in the series are wanting, but it is probable that they exist, as the compound called liquid turpentine camphor is, in the presence of water, converted into terpine, the isomer of its hydrate. If we do not suppose that the hydrate is first formed, we could hardly account for the formation of terpine.

Colophonic hydrate was violently acted on by bromine, accompanied by a copious separation of carbon and hydrobromic acid. In water the action was more manageable, and the ultimate product was a brominated oil, which, after washing first with a diluted solution of carbonate of sodium and then with water, was dried over sulphuric acid. ·471 gramme of this oil, after being decomposed in a sealed tube with pure soda, was treated with an excess of nitric acid and nitrate of silver. It gave ·766 gramme of bromide of silver, agreeing very nearly with the formula of a tetrabrominated compound.

Professor Jellett, who kindly examined this substance for me, as regards its optical properties, finds that it is perfectly inert when in solution, and possesses neither right nor left-handed rotation.†

As previously stated, the light oils from resin, when treated with sulphuric acid and then with water, produce a green substance. This coloration is, however, due to the presence of colophonic hydrate. On treating that compound with acids, a series of striking phenomena is exhibited, conjugated acids being formed, which exhibit a fine display of colours. The generality of these are green. Sulphuric, phosphoric (monobasic and tribasic), arsenious, citric and tartaric acids give these reactions.

On treating the crystals with an excess of the acid, and then adding spirit, the colour is developed. It is necessary to use heat in most cases. The sulphuric acid reaction is capable of rendering evident a milligramme of the new substance, if properly applied. It is not necessary to use heat in this case. Under certain circumstances, hydrochloric acid is capable of producing this green reaction; but when colophonic hydrate is treated with an excess of strong hydrochloric acid, after the expiration of half an hour, a brilliant rose colour is developed on pouring it into alcohol. If the experiment is pushed further, different shades of violets are produced, until the ultimate result of the maceration is a magnificent indigo blue.

Terpine does not give any of these reactions.

As regards the origin of colophonic hydrate, it is pro-

* Formed by the action of dibromhydrate of citrene on acetate of silver, $2(C_{10}H_{18}Br_2) = 4(C_2H_3AgO_2) - 4(AgBr)$.

† It does not differ in this respect from its congeners the terpine hydrates and similar products, in which, although the hydrocarbide preserves its integrity, its gyratory power is suspended.

bably formed under similar circumstances to the terpine camphors, *i.e.* by oxidation, or the assimilation of the elements of water. I have failed, however, in forming this substance artificially by oxidizing the resin spirit with nitric acid.*

It is not present in newly-prepared resin spirit, as I have already explained; and as my supply of colophonic hydrate was expended, my researches upon this substance were, I am sorry to say, brought to a close. It is, however, my intention to renew them at a future period.—*The Chicago Pharmacist.*

HYOSCYAMIN; ITS PREPARATION AND CONSTITUTION, WITH REMARKS ON SOME OTHER SUBSTANCES PRESENT IN HENBANE SEEDS.

BY HEINRICH HÖHN.

Assistant at the Jena Institute of Pharmaceutical Chemistry.

At the suggestion of Professor Ludwig, the author undertook the preparation of a large quantity of hyoscyamin, with the object of studying its characters, and endeavouring to determine its formula.

The material used for the purpose was the seed of *Hyoscyamus niger*, furnished by Herr A. Geheeb, in Geisa.

Separation of Hyoscyamin.—5450 grm. of the fresh seed was dried and coarsely powdered, then extracted with alcohol (containing 90 per cent. by volume) in two successive operations. The tinctures thus obtained were operated upon separately.

After distilling off the alcohol from the first tincture, there was deposited a considerable quantity of yellowish-brown resin, while the remaining residue, which had an acid reaction, separated after some time into a watery layer, and an oily layer floating above. During the cooling of the liquid residue, more of the yellowish-brown resin separated, and this was set aside with the other portion for subsequent examination. The oil was separated and washed three times with hot water; its perfect separation from the aqueous emulsion required long rest on the water bath, and meanwhile more resin was deposited. The resin was nitrogenous.

The whole of the aqueous liquid was then evaporated to about 500 grm. filtered through paper moistened with water, the filtrate rendered alkaline with caustic potash, and then shaken with about $\frac{1}{2}$ lb. of chloroform. The chloroform was then well washed with water and distilled off, leaving about 1 grm. of slightly coloured alkaloid of a tough consistence and strong unpleasant odour. This substance presented all the characters of hyoscyamin described by Geiger. It had a tolerably strong and permanent alkaline reaction, was precipitated by iodine water of a brown colour, by chloride of gold, in yellow flocks that became crystalline after a time, by tannin and chloride of mercury in white flocks, and by caustic potash from a concentrated solution, the precipitate being soluble in excess of the alkali.

A solution of the alkaloid in very dilute alcohol left for evaporation over sulphuric acid, presented on the second day flocculent deposits, which were found under the microscope to be well-developed stellate groups of needles. But since these crystals were still yellow-coloured, and mixed with a viscid substance, they were again dissolved in chloroform, the solution shaken with hydrochloric acid, and the alkaloid again taken up with chloroform after the aqueous solution had been rendered alkaline with carbonate of potash. After evaporating off the chloroform, there remained only about 0·5 grm. of slightly yellow alkaloid, but this could not be crystallized, and even when converted into hydrochlorate, the salt could not be crystallized.

The chloroform that was used for purification, and had been shaken with dilute hydrochloric acid, gave on evaporation a white waxy residue, crystallizing in groups of white needles.

The alkaline liquid that had been shaken with chloroform was slightly acidulated with hydrochloric acid, and a quantity of dark coloured flocks separated, while an odour of butyric acid became sensible. On adding to the filtered liquid a concentrated solution of tannic acid, a yellowish-white precipitate was formed; this was collected on a filter, washed with cold water, dissolved in dilute alcohol, then mixed with fresh precipitated carbonate of lead, and evaporated to dryness. The residual mass was finely powdered, boiled several times with strong alcohol, and the filtered solution distilled. When the liquid was reduced to a certain volume, there were formed small white crystals in the retort; the quantity, however, was too small for collecting, and the whole liquid was evaporated slowly in a capsule, but no sign of crystallization was recognizable, the residue being a tough yellowish mass, of bitter taste, no particular smell, and readily soluble in water or alcohol.

The presence of butyric acid was ascertained, also of volatile bases, and of a glucoside, to which the author gives the name Hyoscypikrin.

The second alcoholic tincture was treated in the same manner and with the same result as before.

The circumstance that the fat oil obtained from the tincture was acid, induced the author to examine this oil for alkaloid, and he found that it contained a considerable quantity of hyoscyamin. However, this could not be crystallized either from alcohol or benzol, but in all instances the solution, when reduced to a small bulk, became gelatinous, and, when dried up, left a shining gummy residue.

In order to exhaust the seed completely, it was finally digested with water, containing about 1 per cent. sulphuric acid. The expressed and filtered liquid was neutralized with ammonia evaporated to a syrup, during which operation much grey slimy substance separated; the thickened liquid was digested with acidified alcohol, the solution neutralized and evaporated; the dark brown residue mixed with ammonia was shaken with chloroform, and gave off a further quantity of hyoscyamin.

The entire quantity of alkaloid obtained from the seed was about 3 grams or 0·06 per cent., which is more than was obtained by Rénard.

The author suggests that since the oil takes up hyoscyamin, it would be desirable in preparing the alkaloid to extract the oil first by means of bisulphide of carbon or some such solvent.

Another difficulty arises from the chloroform remaining mixed in the state of emulsion with the liquids, when it is shaken with them, rendering the operation very tedious. This is best got over by evaporating the liquids to a syrupy consistence and extracting with strong alcohol to separate mucilage, dextrin, etc.

The precipitation of hyoscyamin by chloride of platinum has been confirmed by the author; but it takes place only from concentrated solutions, and the precipitate is redissolved by excess of the chloride of platinum. He had also occasion to observe the strong action of hyoscyamin in dilating the pupil, in consequence of a dilute solution being accidentally spirted into one of his eyes; about a quarter of an hour afterwards considerable dilatation of the pupil took place; on the second day the other eye was similarly affected, and this lasted for three days.

To determine the composition of hyoscyamin, a double salt of gold was prepared and analysed with results leading to the formula:—

$$C_{18}H_{20}NO_6\,HCl\,AuCl_3.$$

* Mr. Turner forwarded me from England a bottle containing resin spirit, in which he had observed crystals. They proved on examination to be colophonic hydrate. The bottle originally contained about 8 oz.; but from evaporation, only half an ounce remained; it consisted of about 25 per cent. of colophonic hydrate. It had been exposed to sunlight for about eight years; light, however, is not essential to the formation of this compound.

The analysis of the pure alkaloid gave results leading to the formula:—

$$C_{36}H_{28}N_2O_6 + HO.$$

Comparing this formula with that of atropin, they differ by C_2H_5N, and, consequently, hyoscyamin might be regarded as atropin, in which H was replaced by methylammonium $C_2H_3H_3N$, or as

$$C_{34}H_{22}(C_2H_3, H_3N)O_6 + HO.$$

The formula calculated from the gold salt would be $C_{36}H_{40}N_2O_{12}$, but if it be assumed that this salt contains 6 atoms of water of crystallization, there would remain $C_{36}H_{34}N_2O_6$, and this comes somewhat nearer to that found above. The difference in the hydrogen was probably due to the hygroscopic nature of the gold salt and the multiplication of the consequent error in analysing a small quantity of substance having so high a formula.

By treating hyoscyamin with caustic alkali it is broken up into an acid, which the author believes to be identical with or closely related to atropic acid, a base analogous to conia, together with some ammonia and bases resembling methylamine.

The waxy crystalline substance above mentioned was very feebly acid in solution; its melting-point was from 208° to 210° C., but it became soft at 120°. It had neither smell nor taste, would not sublime, was insoluble in water, readily soluble in strong alcohol, especially on warming, still more soluble in ether and chloroform. Analysis gave results which appeared to show some relation between this substance and lactucerin $C_{32}H_{26}O_2$, and the author suggests the name hyoscerin, $C_{32}M_{30}O_6$(?).

The analysis of the glucoside, which the author terms hyoscypikrin, gave results leading to the formula $C_{54}H_{52}O_{28}$.

It was not determined conclusively whether the volatile methylic base was formed by the action of caustic alkali or whether it was actually present in the seed.

The nitrogenous resin was purified by dissolving it in weak alcohol, evaporating the solution and pouring off the residual watery liquid from the deposit of resin. This was dried, deprived of adherent fat by digestion with ether, and finally treated with animal charcoal after solution in weak alcohol.

The resin still remained yellowish after this treatment. It could not be crystallized from alcohol or from ether. It had a bitter taste and a peculiar smell; the alcoholic solution scarcely reddened litmus paper. Concentrated sulphuric acid as well as caustic alkalies dissolved the resin with deep orange coloration. Neutral and basic acetates of lead gave a yellowish precipitate with the alcoholic solution. Analysis gave results agreeing with the formula $C_{110}H_{70}N_2O_{32}$. The resin did not appear to be much altered by treatment with dilute acids or alkalies; when boiled several hours with strong caustic alkali, some ammonia was given off.—*Neues Repertorium für Pharmacie.*

THE INTRODUCTION OF CHLOROFORM INTO ANÆSTHETICS.*

In a pamphlet issued by Mr. George Waldie, of Linlithgow, he discusses with some warmth the question of the introduction of chloroform into anæsthetics, maintaining that justice was not done to his brother, Mr. David Waldie, by the late Sir James Y. Simpson in his account of the discovery of its value as an agent for the relief of pain. Mr. G. Waldie says:—

"It never was the desire of my brother to take away from the late Sir James Y. Simpson any of the credit which was justly due to him, neither is it mine in writing these pages; but now that the wonders of organic chemistry are being unfolded, and now that we are in sight of, if we have not already reached, the period when chloroform as an anæsthetic is to be superseded in its turn by some till-now unknown compound, it is time that the history of chloroform should be better known; and what follows will show both the necessity for this, and the obligation laid upon me to contribute towards making it so."

The account given by Mr. David Waldie himself of his share in the discovery is as follows:—

"On occasion of a visit to Dr. Simpson, when in Scotland in 1847, he spoke to me of his trials of various vapours, in his endeavours to discover something else than ether, at that time employed to some extent for anæsthetic purposes, amongst others mentioning chloric ether, the chemical constitution of which he was evidently not aware of. This I explained to him, showing him that it was chiefly vapour of alcohol that would be inhaled, and advised him to try the pure chloroform, which appeared to me likely to be suitable. I promised also to prepare some as soon as I could on my return to Liverpool, and send it to him for trial. Unfortunately the laboratory of the Company had previously been destroyed by fire, and was not then restored, so that I could not prepare it; and in the meantime Dr. Simpson had procured some chloroform, and discovered its effects by inhalation.

"When the news came, not long after my return to Liverpool, I felt pleased at the success of my recommendation, but was also mortified that, from these unfortunate circumstances, I had not been able to do something in carrying it out. I had inhaled both nitrous oxide gas and ether vapours before, and felt interested in the inquiry; and have no doubt but that, if I had been in a position to prepare the chloroform, I should at once have discovered its properties on my own person."

In the first pamphlet issued by Sir James Y. Simpson on the subject of chloroform he gives his account of the circumstances that induced him to experiment with chloroform in these words:—

"With various professional friends more conversant with chemistry than I am, I have since that time [the introduction of anæsthetic practice from America] taken opportunities of talking over the idea which I entertained of the possible existence or discovery of new therapeutic agents, capable of being introduced into the system by respiration, and the possibility of procuring for inhalation vaporizable or volatile preparations of some of our more active and old-established medicines; and I have had, during the summer and autumn, ethereal tinctures, etc., of several potent drugs manufactured for me for experiment by Messrs. Duncan, Flockhart and Co., the excellent chemists and druggists of this city. . . . I have tried upon myself and others the inhalation of other volatile fluids. . . . I have found, however, one infinitely more efficacious than any of the others, viz. chloroform, or the perchloride of formyle, and I am enabled to speak most confidently of its superior anæsthetic properties, having now tried it upon upwards of thirty individuals. The liquid I have used has been manufactured for me by Mr. Hunter, in the laboratory of Messrs. Duncan, Flockhart and Co."

To this was subjoined the following foot-note:—

"In talking over with different chemists what fluids might be sufficiently volatile to be respirable, and hence deserving of being experimented upon, Mr. Waldie first named to me the perchloride of formyle, as worthy, among others, of a trial; Dr. Gregory suggested a trial of the chloride of hydrocarbon, etc. I have been deeply indebted to Dr. Gregory and Dr. Anderson, for their kindness in furnishing me with the requisite chemical agents for these experiments; and also to my assistants, Dr. Keith and Dr. Duncan, for the great and hearty zeal with which they have constantly aided me in conducting the inquiry."

Mr. Waldie disappointed that Sir James should speak of his suggestion in so incidental a manner, and that, too, in a foot-note where it was likely to be overlooked, prepared a paper entitled "Chloroform, the New Agent for producing Insensibility to Pain by Inhalation," which

* 'The True Story of the Introduction of Chloroform into Anæsthetics, being the Original Account given of it in 1847, and a Re-statement in 1870. By David Waldie, F.C.S., Member of the Asiatic Society of Bengal, with Remarks by George Waldie. Linlithgow: George Waldie. Edinburgh: Oliver and Boyd.'

he read shortly afterwards at a meeting of the Liverpool Literary and Philosophical Society, in which, after a short *résumé* of the general history of anæsthetics up to that time, he continues:—

"Dr. J. Y. Simpson, Professor of Midwifery in the University of Edinburgh, who has, since the introduction of ether inhalation into this country, carried on the investigation of the merits of the practice with the greatest ardour and assiduity, had been for some time on the search for other vapours possessing the properties of ether without certain disadvantages connected with its use, the result of which has been the discovery of such properties in chloroform through the following circumstances:—

"The term chloric ether was at one time applied to the chloride of olefiant gas, or Dutch liquid of chemists. In 1831 Mr. Guthrie, an American chemist, was led by a statement in Silliman's 'Elements of Chemistry,' that the alcoholic solution of chloric ether was a grateful and diffusible stimulant, to attempt a cheap and easy process for its preparation. This he did by distilling a mixture of spirit and chloride of lime, collecting the product so long as it came over sweet and aromatic. This both Guthrie and Silliman supposed to be a solution of the chloride of olefiant gas, and called it chloric ether. In reality, it was an impure spirituous solution of chloroform.

"In 1831 Soubeiran, and in 1832 Liebig, prepared liquid by a similar process, and separated the chloroform. Dumas, in 1834, purified it fully, and made an accurate analysis of it; he found it to be composed of 12 parts carbon, 1 part hydrogen, and 106½ parts chlorine, and named it chloroform, from being analogous to formic acid in its composition, but containing chlorine instead of oxygen. From theoretical considerations Liebig termed it perchloride or terchloride of formyle—in chemical symbols C_2HCl_3. It is a colourless transparent liquid of specific gravity nearly 1500, or about 1½ times the weight of water; it boils at 141° F., the vapour having a specific gravity nearly four times that of air; it quickly evaporates at ordinary temperatures, but does not burn easily; it has a sweet taste and agreeable smell; is soluble in all proportions in strong spirit, but very sparingly soluble in water, to which it communicates its taste in a small degree.

"To the best of my knowledge, from the result of many inquiries, it seems to have been introduced into this country as a medicinal agent first in Liverpool, where indeed, in the form of a spirituous solution, it has been more known than in any other part of the country, and from which, I believe, the knowledge of its therapeutic properties has extended. About the year 1838 or 1839 a prescription was brought to the Apothecaries' Hall, Colquitt Street, one ingredient of which was chloric ether. No substance being known there of that name having the properties of that with which the mixture had been previously prepared, Dr. Brett, then the company's chemist, in investigating the subject, found in the United States' Dispensatory the formula for its preparation which has been noticed above, and prepared some. Its properties pleased some of the medical men, particularly Dr. Formby, by whom it was introduced into practice in this town. After coming to take charge of the company's laboratories I found that the method of preparation yielded a product which was not of uniform strength, and sometimes of disagreeable flavour. Accordingly I altered the process by separating and purifying the chloroform, and dissolving it in pure spirit, by which a product of uniform strength and sweet flavour was always obtained. Thus prepared, it is much superior to specimens I have seen of London manufacture. Those members of the profession who are in the habit of using it prefer it greatly to sulphuric ether, as possessing all its remedial value, and being very much more agreeable.

"The vapour of the so-called chloric ether seems to have been tried as a substitute for sulphuric ether in February or March last, but without very satisfactory results, which, indeed, could scarcely be expected, unless the vapour of alcohol possessed the same properties, it being composed principally of alcohol. When in Scotland, in October last, Dr. Simpson introduced the subject to me, inquiring if I knew of anything likely to answer. Chloric ether was mentioned during the conversation, and being well acquainted with its composition, and with the volatility, agreeable flavour, and medicinal properties of chloroform, I recommended him to try it, promising to prepare some after my return to Liverpool, and send it to him. Other engagements and various impediments prevented me from doing this so soon as I should have wished, and in the meantime Dr. Simpson, having procured some in Edinburgh, obtained the results which he communicated to the Medico-Chirurgical Society of Edinburgh on the 10th of November, and which he published in a pamphlet, entitled, 'Notice of a New Anæsthetic Agent as a Substitute for Sulphuric Ether in Surgery and Midwifery.'"

In this paper no remark was made upon Sir James Simpson's acknowledgment. The author, however, sent a copy of the paper to him; but Sir James took no notice of it, either by letter or personally.

As to the amount of credit due to Mr. Waldie for the suggestion, the following statement by Mr. Abraham, of Liverpool,—a gentleman at that time holding a responsible position in the Apothecaries' Company, and now a member of the Council of the Pharmaceutical Society,—has considerable interest:—

"To judge correctly it is necessary to bear in mind one fact in particular, that, at the time when Simpson was induced to try chloroform it was not known as a commercial article. I believe it was not used except in Liverpool, and there by two houses only—the Apothecaries' Company and Mr. Clay—for making chloric ether, to which, I believe, it was usually diluted as soon as made. If Simpson had not met with your brother, it is not at all likely that he would have seen or thought of chloroform; and subsequent experience justifies us in assuming that he would never have found out anything as good."

Mr. Waldie says:—

"Some of my friends have considerably overrated the importance of my share in the discovery, but this I have uniformly discountenanced. Willingly do I acknowledge that the discovery was Dr. Simpson's, and the honour his due. All that I looked for was a distinct and honest acknowledgment that I had recommended, or even suggested, to him to try chloroform. Out of all the great renown and more substantial advantages the discovery brought him, he might easily have spared that; but, irrespective of this, I considered it only an act of justice, and I did not get it.

"It may be asked why I did not then demand it—demand it from him on appeal to the public? I did so indirectly to a limited extent by the paper already alluded to, and have got acknowledgments occasionally more satisfactory than Dr. Simpson's. But I did not press the matter, as I thought it lay with others, not with me, to decide what amount of value the recommendation or suggestion was worth. Possibly it may have been a foolish or a weak course; certainly it has not been a very successful one. Yet I hesitated to say that the value of my suggestion had been underrated, and would probably hesitate even now to proclaim so publicly, though I am inclined to think so upon evidence that in the circumstances seems unimpeachable,—the testimony, indirect, of Sir James Simpson himself."

He then points out the amount of credit given by Sir James Simpson himself, in his last work, the 'History of Modern Anæsthetics, a Second Letter to Dr. Jacob Bigelow,' to Dr. Jackson for having suggested the use of ether to Dr. Morton, and continues:—

"Yet, much as is the credit given to Dr. Jackson for suggesting ether, not a word is said of the man who suggested and recommended chloroform to Dr. Simpson. His name is not once mentioned, and, so far as I am aware, he never got any greater credit from Dr. Simpson for one principal means of obtaining his wide-spread renown, than was conveyed in a foot-note to his original announcement, to the effect that Mr. Waldie had first *mentioned* chloroform to him. The statement was not correct, inasmuch as it conveyed n proper or sufficient intimation of what I had done. I did not merely mention it, I distinctly recommended him to try it, and also intended to help him to do it, an intention which only circumstances prevented me from carrying out.

"I have no wish to detract from the fame of Sir James Simpson. I have the highest admiration of his great and rare talents, and of the marvellous industry with which he applied them to the cultivation of medical science. I can only join in the wide-spread regret which his loss to the world has called forth, and wish that he had lived to answer, if he could, the remarks I have made. His reputation cannot suffer by my getting credit for what I am justly entitled to, and that is all I ask; and I would willingly entertain the hope that, had he been still living amongst us, and my claim been placed before him as it is now before the public, he himself would have admitted its justice."

VEHICLE FOR THE INTERNAL ADMINISTRATION OF CHLOROFORM.

To supply the wants felt by many physicians of a good vehicle for the internal administration of chloroform, Dr. G. Wilson Murdock, of Cold Spring, New York, in a letter to the *Medical Record*, suggests the use of a solution of chloroform in glycerine, which, having tried, he has found to answer the purpose so completely as to leave little to be desired.

Dr. Murdock says that by a little care in rubbing it up, one part of chloroform in bulk can be dissolved in three of glycerine. This solution is perfectly clear, is bland to the taste, and has but a slight odour of chloroform. It can be taken readily as it is, or can be diluted with water to any extent without disturbing the solution. Curiously enough, the addition of water immediately increases the smell of chloroform without any precipitation of it.

In preparing it, it is best to take one part of chloroform with two parts of glycerine; add the chloroform very slowly and rub up carefully. Then put it in a bottle and let it stand twenty-four hours. A little chloroform will have deposited at the bottom. Separate this and rub it up with the third part of glycerine, then mix it with the rest, and the solution is complete. No further separation will take place. Six ounces of glycerine, with two of chloroform, will give seven fluid ounces of the solution, so that each fluid drachm contains about 17 ♏ of chloroform.—*Chicago Pharmacist.*

THE ROASTING OF COFFEE.

In distilling a cold prepared extract of roasted coffee with lime or magnesia, an alkaline distillate is obtained, which, by evaporation after the addition of hydrochloric acid and extracting with alcohol, yields a pure chloride of methyl ammonium. This salt is chloride of ammonium, in which one equivalent of hydrogen is substituted by methyl, the radical of methylated spirit or methyl alcohol, this being the lowest one in the series of alcohols, of which ordinary alcohol and ether are representatives. This product is formed by the decomposition of caffein, when combined with tannic acid, as is the case in all coffees, pure caffein yielding different products of decomposition, among which is cyanogen. In roasting coffee, part of the caffein is volatilized together with some methylamin, while the larger amount remains with the coffee itself. Half of the caffein of the coffee is decomposed in this way; one sample, which before roasting tested 1·45 per cent., yielding afterwards only 0·65 per cent. of caffein. The temperature at which these changes are effected is, in the case of green coffee (Porto Rico), 275° C.; in the case of yellow coffee (Java), 250–255° C.

Caffein is soluble in bisulphide of carbon and in benzole; in benzole especially, to such an extent that it may be used with advantage for the preparation of the pure alkaloid.—*New York Druggists' Circular.*

Poisoning by an Embrocation.—A widow lady named Elizabeth Simpkins, who resided with her brother-in-law at Crewe, has lately died under the following circumstances. It appeared that the deceased had been a sufferer from rheumatism, and that for the last seventeen years she had been in the habit of using an embrocation consisting of chloroform and aconite, prepared by Dr. Dawes, of Longton. About half-past one on the morning in question, she awakened her brother-in-law and told him she had taken the wrong medicine. Medical men were sent for, but on their arrival life was extinct.—*Liverpool Daily Courier.*

Poisoning by Strychnia.—An accident which nearly proved fatal, occurred a few days ago to a lad residing at Bishopsfield, Chester. His master had put some cheese into a cupboard to poison mice. The cupboard was generally locked, but having inadvertently been left unlocked, the boy went to it and ate a piece of the cheese. He soon showed symptoms of poisoning from strychnia and was taken to the infirmary, where the stomach-pump having been applied and antidotes administered, he recovered.—*Liverpool Daily Courier.*

A Child Killed by Worm Lozenges.—An inquest was held at Leeds, on Saturday last, on Arthur Shepherd, aged one year and eight months. The mother of the child had obtained from a Mrs. Geldart, the widow of a herbalist, some lozenges her husband had manufactured during his lifetime, containing sugar, ginger, hellebore, gamboge and calomel, which she had given to the deceased and three other children, the deceased having a quarter of a lozenge, that not being, in the opinion of Mrs. Geldart, too much for a child of that age. After taking the lozenges all the children became sick, the deceased especially so. A medical man was sent for, but when he arrived the child was in a dying state, and its death took place the same night. A *post-mortem* examination showed that it had been poisoned by hellebore. A verdict to that effect was returned, and Mrs. Geldart was cautioned that, if she permitted any more of the lozenges to be used, she might get into serious trouble.—*Leeds Paper.*

Solutions of Soluble Chlorides for Road-Watering.—At the Liverpool Meeting of the British Association Mr. W. J. Cooper, who has introduced the method of watering roads with a solution of deliquescent chlorides, stated, in a paper read by him, that the experiment tried by the Westminster Board of Works at Whitehall and Knightsbridge had been so successful that they had resolved to extend it throughout their entire district. He gave statistics to prove that a saving of expense was effected by his plan; besides which, he called attention to the special value of some of the chlorides in chemically deodorizing and disinfecting the offensive matter deposited on public thoroughfares. Mr. Cooper claims for his present solution, which contains the chloride of sodium and calcium, that the chloride of calcium decomposes the carbonate of ammonia of the horse-droppings, and produces carbonate of lime and chloride of ammonium, which salts, combining with the chloride of sodium, serve to form a layer of concrete on the surface. He now suggests that to the original solution a portion of chloride of aluminium should be added, which he thinks would completely purify and disinfect the streets over which it was spread.

Colouring Materials in Tinctures.—Mr. G. W. Kennedy, of Pottsville, Pennsylvania, in a letter to the *American Journal of Pharmacy*, referring to the presence of red saunders in the United States Pharmacopœia formula for tinct. cinchonæ comp., says that it is not required, as there is colouring matter enough in the other drugs that are used to make the tincture a dark red. He suggests that this is one of the matters that should be taken into consideration in the revision of the United States Pharmacopœia.

Antiseptics in the War Hospitals.—The Berlin correspondent of the *British Medical Journal* writes,—"In 1866 permanganate of potash was the antiseptic remedy *à la mode;* this year it is carbolic acid. In every hospital it is used on the largest scale for dressing and washing wounds, in more or less strict accordance with the directions of Mr. Lister."

The Pharmaceutical Journal.

SATURDAY, OCTOBER 15, 1870.

AUTOGRAPH PRESCRIPTIONS FOR EXAMINATION, LOAN, AND REFERENCE.

Mr. Joseph Ince wishes once more at the opening of the Session to direct attention to this subject. The London collection, consisting of fifteen volumes, is finished, save the concluding book which is reserved for France and Germany. It was thought it would be a want of courtesy to exclude these two great nations, which, had it not been for the late unhappy disturbances would have rendered most energetic aid. It is some satisfaction to note that the value and interest of these written formulæ has in no way diminished during the progress of their arrangement. Switzerland is well represented in recent contributions. Albert Ebert has not forgotten Chicago: the student who consults these pages need not visit Norway: while Mr. Gerard, as well as the London Chemists' Association have amply illustrated the practice of our own celebrated physicians.

More than a passing remark is due to Mr. W. Procter Jr. of Philadelphia for his selection of American Prescriptions. Their worth is much increased by an explanatory letter, containing the names of the prescribers and details of transatlantic Pharmacy.

The following sentence will be read with surprise. "It may be well to observe that in the United States the Latin language is rarely used in writing the directions for the use of a prescription. The general education of Physicians here would not justify it, nor are Pharmaceutists qualified to translate other than the simple and brief directions—especially since the abandonment of Latin in the Revision of 1840."

Fifteen volumes, destined for Provincial Associations, will complete the original scheme. Three have been despatched, six are in active preparation. Bradford, Bristol and Liverpool will head the list, and no pains will be spared to ensure variety in each separate compilation. Eighteen hundred formulæ, which are most earnestly desired will put us in possession of a sufficient library of autographs.

Would our readers kindly aid, and direct their enclosures to the Office of the Secretary?

It was announced last week that for the present Dr. Odling would deliver the chemical lectures to the medical students at King's College, and that Professor Bloxam would conduct the classes for students of applied science, but we understand that, since Bartholomew's Hospital is now without a chemical lecturer, there is a possibility of Dr. Odling's former connection with this school inducing him to resume for a time the lectures there.

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

Total amount of money contributions up to this date £137 0 2
besides contributions of drugs, etc.

Received since the last publication:—
Walter, G. Jameson, Hastings £1 1 0

Erratum.—In Mr. Rogerson's collection, published last week, Mr. S. Parker's subscription should have been 4*s.* 6*d.*, and the total amount collected £16. 9*s.* 6*d.*

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

October 5th, 1870.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Abraham, Atherton, Bottle, Bourdas, Brady, Brown, Deane, Dymond, Edwards, Evans, Hanbury, Hills, Mackay, Reynolds, Stoddart, Sutton, and Woolley.

The minutes of the last meeting were read and confirmed.

The Report of the Finance Committee was presented, showing, on the General Fund account, a balance in the Treasurer's hands of................ £1220. 14*s.* 0*d.*
On the Benevolent Fund account, a balance of .... £617. 19*s.* 11*d.*
And submitting for payment sundry accounts for alterations, repairs, salaries, etc., and annuities, amounting to .... £1367. 13*s.* 10*d.*

Resolved—That the Report of the Finance Committee be received and adopted, and payments made.

Resolved—That in future all accounts relating to expenditure on the house, including alterations and improvements, be examined and certified by the House or other Committee, before being submitted to Council by the Finance Committee.

Resolved—That the Report of the Benevolent Fund Committee be received and adopted, and that the Treasurer be requested to pay the sum of £15 to applicants for relief.

Moved by Mr. Brady, seconded by Mr. Deane, and
Resolved—That in the Sessional Examinations in future, a Silver, instead of a Bronze Medal, be awarded for the first prize, and a Bronze Medal for the second prize. Certificates of honour and merit as heretofore.

Moved by Mr. Dymond, seconded by Mr. Mackay—
"The subject referred to this Council by the last Annual Meeting respecting the keeping, selling, and dispensing of the poisons enumerated in the Pharmacy Act, having been considered, this Council records its opinion that the recommendations already made have been misunderstood, that they embrace the principles on which poison regulations should be framed, but that they are capable of extension, that a Committee be appointed to more fully consider the subject and prepare some explanation of their application, which may be circulated amongst the chemists of the kingdom.

Amendment—Moved by Mr. Woolley, seconded by Mr. Brown—
"That the subject of the Sale and Keeping of Poisons be discussed in Council and not referred to a Committee."

For the Amendment—
Messrs. Atherton, Bottle, Brady, Brown, Reynolds, Sutton, and Woolley.
Against—
Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Evans, Haselden, Hanbury, Hills, Mackay and Sandford.

The Amendment being lost, a further Amendment was moved by Mr. Reynolds, seconded by Mr. Brady,

"That the Poison Regulations proposed by the late Council having been rejected by the Annual Meeting, and condemned by many meetings in various parts of the country, it is not expedient to accept them as the basis of a reconsideration of the subject."

For the Amendment—
Messrs. Atherton, Bottle, Brady, Brown, Reynolds, Sutton and Woolley.

Against—
Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Evans, Haselden, Hanbury, Hills, Mackay, Sandford and Stoddart.

The Amendment being again lost, the following Amendment was moved by Mr. Brown, seconded by Mr. Bottle,

"That the question relating to the storing and dispensing of poisons be referred to a Committee to report to the Council as to the form in which, after due consideration, the matter shall be presented to the Annual Meeting."

For the Amendment—
Messrs. Bottle, Brady, Brown, Stoddart and Woolley.

Against—
Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Haselden, Hanbury, Hills, Mackay and Sandford.

The Amendment being lost, the original Motion was put as a substantive Motion, and carried.

Whereupon certain gentlemen were proposed to form a Committee, but Messrs. Brown and Reynolds objecting that they could not serve on a Committee appointed to consider the question under a foregone conclusion of the Council with which they disagreed, the Council, after some discussion, permitted the withdrawal of the Resolution just passed, in order that all opinions should be represented in the Committee; and it was

Resolved—That it is desirable to take into consideration the question of Regulations for the Sale and Keeping of Poisons, in accordance with the Resolution passed at the last Annual Meeting, and that the following be appointed a Committee for that purpose, viz. Messrs. Abraham, Bottle, Brown, Deane, Dymond, Edwards, Hills, Hanbury, Mackay, Reynolds and Stoddart.

Moved by Mr. Reynolds, seconded by Mr. Sutton, and

Resolved—That the Tabulated Returns on Provincial Education, collected by the Committee on that subject, be received and published in the Journal.

Resolved—That Mr. John Green, of Christchurch, be elected Local Secretary, *vice* Mr. Henry Sharp, deceased.

Resolved—That the following, having passed their respective examinations, be elected

ASSOCIATES OF THE SOCIETY.

MINOR.

Fox, William Albert ....St. Albans.
Nuthall, Edwin ....Norwich.
Thompson, Benjamin ....Brighton.

Resolved—That the following, having passed their respective Examinations, be elected

ASSOCIATES IN BUSINESS.

MINOR.

Riddle, William R. ....Hexham.

MODIFIED.

Hayward, George................Croydon.
Reedman, William Henry ....Bletchingley.

Resolved—That the following Registered Chemists and Druggists be elected Members of the Society:—

Ball, Edwin..............Buxton.
Curtis, Thomas West.....Holbeach.
Martin, John ....Seacombe.
Miller, William Henry ....Ridgeway.
Welch, Charles ....Reading.

LONDON.

John M'Lean....11, Clifton Road, Paddington.
Henry Astrop ..Old Kent Road.

The Secretary presented the name of a member who had paid his subscription since the 30th April.

Resolved—That he be re-elected a member of the Society on payment of a fine of one shilling.

Resolved—That the 'PHARMACEUTICAL JOURNAL AND TRANSACTIONS' be supplied to the Midland Counties' Chemists' Association regularly as published.

THE JACOB BELL PORTRAIT.

Mr. HILLS called the attention of the Council to his original proposal, as to the application of the proceeds of the sale of the Engravings of the Portrait of the late Jacob Bell, viz.,

That the proceeds of the sale of the Engravings of the Portrait be invested, and the interest of the same be applied to the purchase of books to be selected and given by the Examiners as prizes at their monthly Examinations to the candidate who shall pass the Minor Examination, first in honours, and in the opinion of the Board be entitled to the prize.

Mr. Hills then said that the proceeds of the sale of the portraits had not amounted to as much as he had hoped, and he desired, if the Council would allow him, to supplement the amount received by the donation of a sufficient sum to produce £10 a year, and he had, in fact, with that view purchased two £100 bonds of the 1870 5 per cent. Russian Loan. He wished now, therefore, to hand over the bonds he had purchased, for the purpose originally expressed by him, of establishing a Prize Fund. He would suggest that a prize of books, of a nature to assist the student in preparing himself for the Major Examination, should be given monthly, by the Board of Examiners, to the candidate for the Minor Examination who most distinguished himself, provided such candidate took honours in the Examination; for this reason, that it would be an additional inducement for the student to present himself for the Major Examination. Mr. Hills wished it to be quite understood that he merely offered this as a suggestion, but would prefer that the details of the distribution of the fund should be left entirely at the discretion of the Council and the Board of Examiners.

Resolved—That the very cordial thanks of the Council on behalf of the Society be tendered to T. H. Hills, Esq., for his handsome and liberal offer of the Fund he now proposes to hand over for the purpose of purchasing prizes to be given to the successful candidates at the Minor Examinations.

PHARMACEUTICAL ED

TABULATED RETURNS FROM PRO

(THE NUMBERS OF STUDENTS I

	NAME OF SOCIETY AND YEAR OF ESTABLISHMENT.	PREPARATION FOR THE PRELIMINARY EXAMINATION. Teacher.	Fee.	Lesson Hour.	No. of Students entered.	No. of Lessons.	CHEMISTRY (INORGANIC AND Teacher.	Fee.	Lecture Hour.
ABERDEEN	Society of Chemists and Druggists (1839)	....	......	......	....	..	Dr. Beveridge..	(a)	8
ASHTON-UNDER-LYNE	Ashton-under-Lyne and Dukinfield Chemists' Association (1869)	....	......	......	....	..	(b)	......	....
BATH	Chemists' Assoc. (1864)	....	......	......	....	..	....	......	....
BIRMINGHAM	Midland Counties Chemists' Assoc. (1869)	....	......	......	....	..	(c)	......	....
	Chemists' Assistants' Association (1868)	....	......	......	....	..	....	......	....
BRADFORD	Chemists' Association	....	......	......	....	..	George Ward, F.C.S.	(d)	8.30 P.M
BRISTOL	Pharmaceutical Association (re-estab. 1869)	....	......	......	....	..	....	......	....
COLCHESTER ..	Association of Chemists and Druggists (1841).	....	......	......	....	..	....	......	....
DUNDEE	Chemists and Druggists' Association	....	......	......	....	..	....	......	....
EDINBURGH (f)	....	....	......	......	....	..	....	......	....
EXETER	Exeter Pharmaceutical Society (1845)	....	......	......	....	..	(e)	......	....
GLASGOW	Chemists and Druggists' Mutual Improvement Association (1854)	(g)	......	......	....	..	(g)	......	....
GOSPORT......	....	....	......	......	....	..	....	......	....
HALIFAX	Halifax and District Chemists and Druggists' Association (1868)	Mr. Gibb ...... (Latin only, weekly.)	5s. per sess.	8–9 P.M.	10	..	Mr. Jarmain, F.C.S.	5s. per sess.	Elem. 8–[cut off] P.M. Adv. 8.30–9.30 P.M.
HULL	Chemists' Association (1868)	....	......	......	....	..	....	......	....
LEEDS	Chemists' Association (1862)	Mr. Mcgilley ..	A class 42s. B 21s.	8–10 6–8	....	..	Geo. Ward, F.C.S. S. Jefferson, F.C.S. Geo. Ward, F.C.S. (Organic.)	Inorg. {21s. 5s. 10s. 6d.	8.15–10 8–9.30 8.30–9.45
LEICESTER	Chemists' Assistants and Apprentices' Association (1869)	Mr. W. B. Clark Mr. H. Cooper (Latin only.)	Free Free	8.30–10.30 ditto	11 11	.. ..	Mr. H. Cooper..	free	8.30–10.30
LIVERPOOL....	Chemists' Assoc. (1868)	....	......	......	....	..	Edward Davies, F.C.S.	free	7–8 P.M.
MANCHESTER ..	Chemists and Druggists' Association	J. Smith, B.A. .. (Latin only.)	5s.	6 P.M.	49	20	C. Schorlemmer, F.C.S.	7s. 6d. Including Pharmacy	6 P.M.
NEWCASTLE-ON-TYNE	No return	....	......	......	....	..	....	......	....
NOTTINGHAM ..	Nottingham and Notts Chemists' Association	Mr. Bray ...... (Latin only.)	5s.	9–10 P.M.	25	13	Mr. Sissling....	5s.	8–9 P.M.
PLYMOUTH	Association of Chemists for Plymouth, Devonport and Stonehouse .	....	......	......	....	..	Mr. Ryder (h) ..	10s.	....
SHEFFIELD	Pharmaceutical and Chemical Association	....	......	......	....	..	Geo. Harrison, F.C.S.	10s. 6d.	9–10 P.M.
SUNDERLAND ..	Chemists' Association	....	......	......	....	..	Mr. Curry......	10s.	8.30 P.M.–
YORK	Chemists' Association	....	......	......	....	..	....	......	....

(a) The fee for the three classes of Chemistry (Inorganic and Organic), Materia Medica and Pharmacy, and Botany, inclusive, is 21s. There are four lectures in each week, and the return of students under Chemistry appears to apply to all the classes.

(b) Students attend the classes in Manchester, the dis[tance] being six miles.

(c) The Midland Institute supplies lectures in Latin, [Che]mistry and Materia Medica, which are well attende[d by] chemists' assistants. See note on separate page.

N IN THE PROVINCES.

ASSOCIATIONS.—SESSION 1868-1869.

THOSE ENGAGED IN PHARMACY.)

The Returns for 1869-70 will appear in a future Number.

CHEMISTRY (PRACTICAL).					MATERIA MEDICA AND PHARMACY.					BOTANY.					Total Number of Lectures. (Prelim. Ex. excluded.)
Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	
....	....	......	....	..	Dr. Beveridge	(a)	......	....	..	Dr. Beveridge ..	(a)	......	....	..	......
....	....	......	....	..	(b)	......	......	....	..	(b)	......			..	......
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....	....	......	....	..	....	......	......	....	..	L.C. Miall, F.L.S.	(d)	8.30 P.M.	28	14	26
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C. Moffat, .D., F.R.S.E.	21s.	9.30 P.M.	13	25	....	......	......	....	..	(g)					......
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eorge Ward, F.C.S.	21s.	7.30–10	6	28	....	......	......	....	..	Mr. J. Abbott ..	5s.	7–8 A.M.	20	30	144
. H. Cooper	free	8.30–10.30	11	..	Mr. W. E. Hill	free	8.30–10.30	11	..	Mr. Jos. Young .	......	8.30–10.30	11	..	......
ward Davies	63s.	7–9	6	26	Dr. Carter, B.Sc.	42s. Including Botany.	7–9	....	26	.... Included in Mat. Med. and Pharmacy.	......	......	....	..	67
....	....	......	....	..	A. Somers, M.R.C.S.	6s. Not including Pharmacy.	7.30 P.M.	58	12	Prof. Williamson, F.R.S.	5s.	4 P.M.	28	12	44
....	....	......	....	..	....	......	......	....	..	....	......	......	....	..	......
....	....	......	....	..	....	......	......	....	..	....	......	......	....	..	26
....	....	......	....	..	Various Chemists Members.	free to assoc.	8 P.M.	12	12	F. P. Balkwill, (h) Sys. Ec.	Sys. 5s. Phy. 5s.	10–12 7–8.30	20 20	30 30	72
....	....	......	....	..	Mr. Gowland, F.C.S.	10s. 6d.	9–10 P.M.	15	12	Mr. Birks	10s. 6d.	9–10 P.M.	22	10	34
....	....	......	....	..	....	......	......	....	..	....	......	......	....	..	12
....	....	......	....	..	....	......	......	....	..	....	......	......	....	..	......

Fee for Chemistry and Botany, inclusive, 5s.
There are Chemistry and Botany classes at the Govern-
Science School.
No return. *Vide* Table for 1869-70.
Anderson's University and the Mechanics' Institute have hitherto supplied students with lectures in Latin, Chemistry and Botany, but the business hours of a large portion of the trade are such as to prevent many from taking advantage of them.

(*h*) The classes are in connection with the Plymouth and Devonport Science School.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Second Annual General Meeting of the above Association was held in the Memorial Hall, Albert Square, on Friday, October 7th; Mr. W. S. Brown, Vice-President, in the chair.

The following report was read by the Honorary Secretary:—

Your Council have again the satisfaction of presenting a favourable Report of the condition and prospects of the Association. The number of members and associates on the books, though fewer than last year, is still large. The passing of the Pharmacy Act in 1868 startled the entire trade out of its apathy, and the result was a sudden interest in the future of our vocation, evidencing itself in this district by a ready response to the canvass for members which was at that time made. Some of these have not maintained their connection with the Association, and their places have been but partially filled up by new members. There is reason to believe, however, that those who remain are they who take a real interest in the aims and work of our Society, and that our real strength is not less, but greater.

The pharmaceutical courses established last session at Owens College were not in all cases so largely attended as was anticipated. Some dissatisfaction was expressed in the daily papers at the hour which had been chosen for the delivery of the lectures; this point has been most carefully reconsidered, and with the very kind co-operation of the trustees and professors of the College, some new arrangements have been made, which it is hoped will meet the requirements of the majority of those for whose benefit they have been undertaken. One of the principal features in the new scheme is a course of lectures on Practical Pharmacy; one of our own members, Mr. Louis Siebold, having been appointed lecturer; and it is confidently hoped that this class will be as well attended as the importance of the subject deserves. The following is a detailed syllabus of the whole Pharmaceutical course:—Five courses of lectures, comprising twenty-seven lectures each,—Pharmaceutical Latin, Professor Wilkins, M.A., or Mr. Bentley, M.A., Mondays, 3 to 4 P.M. Chemistry, Professor Roscoe, F.R.S., or Dr. Thorpe, Mondays, 4 to 5 P.M. Pharmacy, Mr. Siebold, Wednesdays, 4 to 5 P.M. Materia Medica, Mr. Somers, Wednesdays, 5 to 6 P.M. Botany, Professor Williamson, F.R.S., Wednesdays, 7.30 to 8.30 P.M. The lecture fees are 15*s.* for one course, £2 for three courses, and £3 for the complete series of five. A Laboratory course of Practical Pharmaceutical Chemistry, by Professor Roscoe, F.R.S., and Mr. Schorlemmer, F.C.S., Mondays, from 6 to 8.30 P.M. This class is intended for those students in pharmacy who have already passed through the lectures on Elementary Chemistry, or who have otherwise made themselves acquainted with the principles of the science. Each of these students will be provided with a working-table, set of tests and all the requisite apparatus: fee, £4. 4*s.* A prize for diligent attendance throughout the session and proficiency in the examinations, will be given in each class by the Manchester Chemists and Druggists' Association, at the end of the session. The Principal will attend at the College to admit new students on Thursday and Friday, the 6th and 7th of October, from 6.30 to 9 P.M., or entries may be made with Mr. F. Baden Benger, Hon. Sec. of the Association, 1, Market Place. Those students who are unable to attend the afternoon classes may substitute corresponding evening classes, for particulars of which see prospectus.

The advantages thus offered to pharmaceutical students in Manchester and district are such as but very few cities could provide, and your Council cannot too strongly urge Members and Associates to make the arrangements as extensively known and availed of as possible.

Keeping in view the main object of the Association, to provide means of professional and scientific education for assistants and apprentices, great efforts have been made during the past session to found a library and museum. These efforts have—through the liberality of many friends, some unconnected with Manchester, except by sympathy with our cause—been attended with an encouraging degree of success. Upwards of £65 has been subscribed to a special library fund; part of this has been invested in standard works of reference, and the Library Committee is about to make further purchases. For the accommodation of these books and their readers, it has been necessary to purchase a book-case and to rent and furnish a suitable room; this has been done in Mitre Chambers, Cathedral Gates. It is open for the use of Members and Associates on Monday, Wednesday, and Friday evenings, from six to ten, and it is hoped will be much resorted to during the winter months. The expenses connected with this undertaking have somewhat reduced the balance of the General Fund, but it was thought desirable to devote the whole of the Special Library Fund to the purchase of books. A large and handsome cabinet for the materia medica specimens, containing one hundred and thirty drawers, has been presented by Messrs. Woolley, and a series of remarkably beautiful specimens of dried and mounted medicinal plants, by Mr. Ransome, of Hitchin. Mr. T. H. Hills, of London, has generously contributed engravings of the late Jacob Bell, John Bell and Jonathan Pereira, accompanied by a cheque for £5. 5*s.* to the Library Fund, and Mr. J. J. Pyne a complete series of the Pharmaceutical Journal from its commencement, in thirty volumes, with other books.

The monthly meetings of the past session were supplied with interesting papers and were well attended. These were held alternately on the afternoon and evening of the first Friday in the month. Tea was provided at the evening meetings, and it is proposed to continue this arrangement for the present. The Council would be glad if the associates as well as members would contribute papers or introduce subjects for discussion at these meetings, the success of which so much depends on the hearty co-operation of all.

To maintain and extend the usefulness of this Association should be the desire, as it is the interest, of every chemist and druggist, assistant and apprentice in Manchester and the surrounding towns. Its efforts to promote the good of the entire trade commend it to principals, and the merely nominal associates' fee of 2*s.* 6*d.* per annum cannot be beyond the means of the poorest apprentice; yet for this small sum he obtains access to such books, materia medica specimens, etc., as will prove of great service to him in preparing for the inevitable examination, besides sharing the advantages which are inseparable from association with those engaged in similar studies.

Your Council trusts that the Association will be strengthened by a large accession of members during the present session.

The Treasurer in Account with the Manchester Chemists and Druggists' Association.

		£.	s.	d.
1869.				
Oct. 6.	To Cash in hand	4	1	8½
	,, ,, Bank	86	5	6
1870.				
Sept. 30.	,, 114 Members	57	0	0
	,, 95 Associates	11	17	6
	,, Cash for 11 Lists	0	11	0
	,, Bank Interest	2	1	10
		£162	7	6½
	To Balance brought down	73	18	8½

	£.	s.	d.
By Cash for Stationery, Stamps, Printing and Advertising	29	5	2
" Owens College Fees for Summer Course (1869) of Botany	14	12	0
" Rooms, etc., for Meetings in Memorial Hall	11	13	4
" Ditto, Mitre Chambers	9	10	10
" Porter for taking charge of Rooms	3	4	0
" Collector's Commission	2	2	6
" Furniture	15	15	6
" Gas Fittings	1	19	6
" Sundries	0	5	0
" Balance in hand	0	2	5½
" " Bank	73	17	3
	£162	7	6½

Library Fund.

1870.		£	s.	d.
Sept. 30.	To Subscriptions received	63	11	6
		£63	11	6
Oct. 1.	To Balance brought down	28	5	7

		£	s.	d.
May 16.	By Stamps and Envelopes	2	6	11
July 1.	" Cash for Books	32	19	0
Sept. 30.	" Balance in Bank	28	5	7
		£63	11	6

Examined and found correct, September 27th, 1870. } STANDEN PAINE. WILLIAM BAGSHAW.

In moving the adoption of the report, the CHAIRMAN, after remarking that he was glad to see such a large attendance of members, and friends whom they cordially welcomed and hoped to include in their ranks, said the Association was formed two years ago, under an impulse communicated by the passing of the Pharmacy Act, 1868, and they had great reason to congratulate themselves upon the continued success which had attended its operations. He thought they had been more successful than they could have anticipated; and certainly when they contrasted their progress with that of kindred associations, Manchester had no reason to be ashamed of the efforts put forth, or with the results attained. These were not only professional but social, and have had many practical outcomes in the experience mutually communicated, and the mutual confidence and goodwill established between members of the same business who had previously very little knowledge of each other. Beyond that, and as the principal object of their Association—the education of apprentices and assistants of the present day, who would be the pharmacists of the future,—they had every reason for congratulation that in the outset they decided to connect themselves with that noble institution which Manchester had the privilege of possessing, and ought to be exceedingly proud of—Owens College. The cordial co-operation accorded to them by the trustees of that institution had culminated in the producing for the present session of a course of lectures which he thought would bear comparison even with the Central School in Bloomsbury Square. He believed no other city or town had such a complete course of pharmaceutical education provided at so small a cost. He hoped this state of things would result in a large accession both of members and associates, for it was most important that they should have the encouragement of a large number of members and associates and large attendances, and they looked to their future connection with Owens College as likely to result in the establishment of an institution to provide pharmaceutical education, and eventually in a college of pharmacy, which might attain a high position. Efforts made in providing pharmaceutical education had been hitherto principally confined to the parent institution in London, where there was a large and flourishing educational establishment, but that was only available to a few. The application of that kind of education locally had occupied the attention of the governing body, and it was confidently hoped that in a short time a practical scheme would be devised by which assistance could be afforded to localities where such advantages as were presented in Manchester were not available. He trusted that they would be able to do without any extraneous aid at all. They had endeavoured to meet all requirements both in town and country by the arrangement of their meetings, and he hoped that the appeal they had put forth in the report would bring many new members. Let them not be content with 114 members, but go on until all who were connected with the business became associated. He hoped to see more of their friends of the medical profession, for it was most important that there should not be needless and causeless jealousy. He referred with satisfaction to the state of the library fund, and expected to see it largely increased in the future. The work of the Association, he took it, had not only had a practical effect in their own city but in many places. The action they took when some objectionable regulations with regard to the selling and dispensing of poisons were sought to be forced upon them by legal enactment, was supported by many other kindred institutions, and it resulted in the defeat of an attempt made, without protecting the public in any way, to impose restrictions that were objectionable, and rendered it difficult to carry on the business of a chemist with that freedom and care which had always characterized the trade. In conclusion, he advocated such a shortening of the hours of labour as would allow apprentices and assistants more time for study, and moved the adoption of the report and statement of accounts.

Mr. SLUGG seconded the motion, and said he considered the report an admirable one, and that the Association was in a most healthy state.

The report having been adopted, it was announced that Mr. Standring had expressed his wish to retire from the office of President; whilst he sympathized with the work of the Association, his failing health and distant residence from town, rendered it impossible for him to fulfil the duties of President satisfactorily.

It was then proposed by Mr. G. S. WOOLLEY, and seconded by Mr. F. B. BENGER, and carried unanimously, that Mr. W. S. Brown, whose energy, zeal and ability were so well known to the members, be elected President.

On the motion of Mr. HALLIDAY, seconded by Mr. HAMPSON, an alteration was made in the Bye-laws to allow of the election of two Vice-Presidents.

Mr. J. T. Slugg, F.R.A.S., and Mr. Wilkinson were then unanimously elected to these offices.

Two vacancies occurring in the Council list by the retirement of Mr. Standring and Mr. Bateman, Mr. Redford, of Messrs. Ransome and Co., and Mr. Hughes of Victoria Street, were elected; the remaining members of the Council were re-elected, as were also the Hon. Sec., Mr. F. B. Benger, and the Treasurer, Mr. G. S. Woolley.

Professor Attfield, of Bloomsbury Square, London, and Mr. T. H. Hills, of 338, Oxford Street, London, two gentlemen who had shown much kind interest in the success of the Association, were elected honorary members.

It was announced that the next monthly meeting would be held in the Memorial Hall, on Friday evening, November 4th. Tea and coffee at 7 P.M.; the subject for discussion being "Apprenticeships and Pharmaceutical Education in the Provinces."

Tannin and Glycerin Pencils.—Dr. Schuster proposes the use of tannin mixed with glycerin as a substitute for caustic injections. This material is at first waxy, but soon becomes hard, and it melts in a moist atmosphere at the temperature of the body.—*Lancet.*

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Wednesday, September 14th.

A Century of Old Books.

BY JOSEPH INCE.

(*Concluded from page* 298.)

The late Dr. Pereira's note-book on Cardamoms.

Interesting as showing with what labour and patience the author sought for and noted information relative to any particular subject on which he was at work.

Christiani Francisci Paullini Μοσχοκαρυογραφια *seu Nucis Moschatæ Curiosa descriptio, historico-medico-physica. Francofurti et Lipsiæ*, 1704. 8o.

A curiosity of prolixity, the whole work of 876 pages being devoted to a discussion on *Nutmegs.*

Herbarius Pataviæ, printed at Padua in 1485.

It consists of an alphabetical catalogue of medicinal plants, a rude representation of which heads each chapter. The name of each plant is given in German as well as in Latin.

*Otho Brunfels.—Herbarum Vivæ Eicones ad naturæ imitationem, summâ cum diligentiâ et artificio effigiatæ una cum effectibus earundem * * * Argentorati*, 1530. *fol.*

Brunfels, a native of Mentz, was a theologian and physician occupying in the latter capacity the post of *poliater* or chief medical officer of the city of Bern. In this office he died A.D. 1534. Of his numerous works that of which the title is here given is remarkable for its excellent woodcuts, which have indubitably, as the author asserts, been made from the very plants and not drawn from memory or imagination. In this respect they present a most striking contrast to the figures in other works of the period, as well as in many of those of a much later date.

It is much to be regretted that the time was too limited to examine these specimens of ancient pharmacy in detail. Pharmacopœias of various date and type, abounded. Quaint tractates, such as The Garden of Health (1649.) Boyle's Noctiluca (1680). Conclave of Physicians (1686) Pharmacopœia Reformata (1744) Holt Waters (1731) Val. Cordi Dispensatorium (1690). Speculum Lapidum Camilli Leonardi (1502) Secrets of Alexis (1568) and about forty similar productions were not wanting.

Some Latin Books were worthy of special commendation, amongst which may be mentioned Valerius Cordus, a small but most interesting volume. Mr. Haselden undertook several, and also contributed a notice of the celebrated Dr. Radcliffe, part of which we subjoin.

Dr. Radcliffe's Practical Dispensatory.

A portrait of the doctor, wearing a long, flowing, curling wig, after the fashion of the period, adorns the frontispiece, under which is written, "Johannes Radcliffe, M.D. Ob. Nov. 1, 1714. Ætat. 64. Printed for Charles Rivington, in St. Paul's Churchyard.

Before we examine the contents of the book, let us indulge in a brief account of this once celebrated doctor.

He was born at Wakefield, Yorkshire, in 1650, near which place his father was possessed of a moderate estate, who having a numerous family, did not think it prudent on account of the expense, to breed his children to letters, but at the prompting of his neighbours was induced at length to send this son to a school at Wakefield. Having shown great aptitude in learning he was removed at fifteen to Oxford, and entered at University College, 1665. In 1669 he took his first degree, and was chosen Senior Scholar of this college. In June, 1672, he took his degree of M.A., and in 1675, Bachelor of Physic. After this he practised in Oxford until 1684, when he came and settled in London.* In the autumn of 1689, when he resided in Bow Street, Covent Garden, an urgent message reached him rather late in the day. Hurrying into his carriage, he hastened with all speed to Kensington House, then the palace of his Majesty King William the Third. He was ushered into the sick chamber of the king, who had been some time unwell. "Doctor," said the king, "Bentinck (Earl of Portland) and Zuleistein (Earl of Rochford) have been urgent with me that I should again send for you; and though I have great confidence in my two body physicians here, yet I have heard so much of your skill, that I desire you will confer with Bidloo and Laurence [the medical attendants], whether some other plan might not be adopted." "May it please your Majesty," said Dr. Radcliffe, "I must be plain with you, sir. Your case is one of danger, no doubt, but if you will adhere to my prescriptions I will engage to do you good." The consultation between the professionals was short, the treatment altered, and the royal patient was soon restored, and a few months afterwards, he fought the battle of the Boyne.

The doctor was a great frequenter of taverns and clubs, where the choicest spirits of the day were wont to assemble. He was at one time engaged to be married to the daughter of a wealthy citizen, but a discovery which he seemingly made during his courtship, and which did not redound to the lady's credit, caused him to break the engagement, although a source of regret at the time; but in his plain peculiar way he infers that the lady, however a very deserving gentlewoman, is not fit to be his wife, as she is, or ought to be, another man's already.

His practice was very large, and increased daily. He had considerable humour, and once when sent for to a gentleman suffering from quinsy, for which no application had been of service, he desired the lady of the house to have a hasty pudding prepared, and when done his own servants brought it up. It was placed on the table in full view of the patient. "Come, Jack and Dick," said Radcliffe, "eat as quickly as possible; you have had no breakfast this morning." Previously instructed, they commenced a fierce attack upon the pudding; but one dipping faster than the other, a quarrel arose, ending in the pudding being pelted at each other. The patient was seized with a hearty fit of laughter, the quinsy burst, discharged its contents, and the cure was thus speedily effected. He always spoke confidently, and thus inspired hope and faith in his patients. When in his sixtieth year he was once more in love with a very young lady, but was unfortunate and rejected, and so remained single for the rest of his life. Speaking of himself in the latter part of his days, he says, "By following the dictates of common sense, while I practised at Oxford, after taking my degree of Bachelor of Medicine, instead of stoving up my patients who were ill of the small-pox, I gave them air and cooling emulsions, and thus rescued more than a hundred from the grave." He always discountenanced quacks and intermeddlers, as he styled them.

He realized by his practice a princely fortune, and is now more particularly remembered by the way in which, looking upon Oxford, his Alma Mater, he bequeathed property. He left his Yorkshire estate to the Master and Fellows of the University College for ever, in trust for the foundation of two travelling fellowships; £5000 for the enlargement of the building of the University College; £40,000 for building a library at Oxford; £500 yearly for ever towards mending the diet of St. Bartholomew's Hospital.

The 'Pharmacopœia Practica' is divided into two parts and an appendix. In the first part, twelve chapters treat of Cathartics, Glysters, Suppositories, Diaphoretics, Leeching, Tapping, etc. etc. In the second part, six chapters treating of Restoratives, Attenuants, Neutrals, etc. etc. The appendix of Opiates, Milk, Dipping, Axioms concerning local medicines, etc. etc., an index to the first and second parts, referring to every remedy or disease mentioned in the work.

* From the *Universal Magazine* for July, 1760.

To give an example or two of the style of the Author and his treatment of disease, we quote this, touching on Cholera.

"When Persons are inclinable to a Vomiting, Promotion is often necessary; and therefore in a *Cholera Morbus*, where there is an abundance of bilious and sharp Humours, there you may gently promote it by giving Chicken Broath or Whey or Barley-water; after you have diluted and washed well, give 'em *Decoct. Alb.* and attemperating Draughts with *Laudanum* in 'em till the Vomiting ceases. I speak upon a supposal that you are called early in; because if the Vomiting has continued so long as to have exhausted the spirits, nothing remains to be done save the giving of Opiates and Cordials." The learned in treatment may decide how far this differs from modern usage.

The following for an Enema may in some degree surprise dispensers accustomed to the extreme simplicity, simple sometimes to a fault, of modern prescribers.

Take the decoction of Aromaticks, viz., Calamus Aromaticus, Galangal, of each half an ounce; Leaves of Mint, Wormwood, Centaury Tops, of each two Pugils [handfuls]; Seeds of Caraways, Anise Seeds, and Cardamoms, of each half an ounce; mix with it Electuary Lenitive, and *Epsom* Salt, of each one ounce; Oil of Amber, half a dram; mix and make a Glyster, to be thrown in."

There are numerous eccentric forms similar to the above, and many others simple as those in general use at the present time. Some of the means prescribed would scarcely admit of being printed now, therefore we pass them over. Many of the observations are full of sound reasoning, and, deprived of peculiarities, might stand side by side with the writings of modern authors; and with this we close our remarks on Dr. Radcliffe's Pharmacopœia Practica.

Farther we need not quote; but we must reprint two articles—the first by Professor Wanklyn, and the second by Mr. Ince.

The Hermetical Triumph, or, the Victorious Philosophical Stone. A Treatise more compleat and more intelligible than any yet Extant, concerning the Hermetical Magistery. Translated from the French. To which is added, The Ancient War of the Knights, being an Alchymistical Dialogue betwixt our Stone, Gold, and Mercury; of the true Matter, of which those who have traced Nature do prepare the Philosopher's Stone. Translated from the German. London: Printed by F. Noble, at Otway's Head, St. Martin's Court, near Leicester Fields. 1740.

Opposite the title page there is a very elaborate frontispiece.

"The Ancient War of the Knights" was "composed originally in the German tongue by a very able Philosopher," and is given in duplicate in this book.

One English translation, which is to be found towards the end of the book, was made directly from the German. The other English translation was made from the French version, which itself had been made from a Latin translation of the original German. As might be expected, the English direct from the original German is vigorous and terse, whilst the other is comparatively weak and verbose.

The "War" consists mainly of a discussion between the "Stone" and "Gold" as to their relative merits; the part taken by Mercury being very slight, and confined to a single expression of assent made to a remark made by Gold.

A very curious passage, warning the reader against attributing the plain and literal sense to works of this kind may be quoted from the dialogue. "But when they name barely the name of Gold and Mercury, they do it to hide the Art from the senseless and the unworthy, knowing very well that such only dwell upon Names and written processes, without meditating further upon the foundation of this Matter. But the Prudent and Diligent read with Prudence, and ponder how one squares with the other, out of which they get a Foundation; finding thus by speculation, and from the Philosopher's sentences, the true matter which no Philosopher ever named and described openly by its true Name."

That the writings of "true Philosophers" should be somewhat hard to understand, need therefore not occasion much astonishment.

There is gold, such as we find it, and there is an ideal gold such as we never find it, and which never appears to be endowed with infinite perfections. With our modern ideas and modes of thought it is hard to bring our minds into a proper frame for the study of these old alchemical writings.

J. A. Wanklyn.

Primitive Physick; or an Easy and Natural Method of curing Most Diseases. By John Wesley. Homo sum: humani nihil a me alienum puto. Bristol: Printed by William Pine, in Narrow Wine Street; and sold at the New Room, in the Horse-Fair; and at the Foundery, near Upper-Moor-Fields, London. 1762.

This was the book that afforded so much amusement to Robert Southey, who, with the most good-natured pleasantry, reviewed its contents. He recounts how the laborious evangelist, wearied with his efforts, retired to a friend's house and applied a certain plaister, the healing merits of which he subsequently described in terms of extreme laudation. Southey was inclined to think that cessation from apostolic work, and needed rest, should have had their share of credit in the cure effected.

The chief interest of the treatise lies in the preface, some passages of which have become household words in the community which the writer founded. Wesley first states that man before the fall was in perfect health; he was in harmony with nature—nature at peace with him. Then came sin, and disease followed in its train; but great remedies are provided of which temperance and exercise are chief. Physick was at first traditional, the father handing down his observations to the son; or else these stores of knowledge remained in the keeping of the elders. Further advance was made by what is termed accident: a man walking in a grove of pines finds out the use of the natural, exuded gum, just as in later times the value of Peruvian bark was brought to light. Eventually hypothesis dethroned experience, theories sprung up and the science of medicine was established. Physicians were held in honour, and profit attended their employ; hence the wish to shroud their art in mystery, to talk splendid darkness about astrology and astronomy, and to keep the profane vulgar at a distance. "Yet there have not been wanting from time to time, some lovers of mankind who have endeavoured (even contrary to their own interest) to reduce Physick to its antient standard: [they have shewn] that every man of common sense (unless in some rare cases) may prescribe either to himself or his neighbour, and may be very secure from doing harm, even where he can do no good. Even in the last age there was something of this kind done, particularly by the great and good Dr. Sydenham."

"Without any regard to this, without any concern about the obliging or disobliging any man living; a mean hand has made here some little attempt toward a plain and easy way of curing most diseases. I have only consulted herein experience, common sense, and the common interest of mankind." Such is the intention of the book. In its day it commanded a large sale, though it will scarcely bear the test of modern investigation. The author started with two inestimable blessings: a comfortable appreciation of his own abilities, and thorough confidence in himself. It seems that full allowance being made, the perusal of the directions will create a feeling of disappointment. The following sentence has been often quoted. "The Love of God, as it is the sovereign remedy of all miseries; so in particular it effectually prevents all the bodily disorders the passions introduce, by keeping the passions themselves within due bounds. And by the unspeakable joy and perfect calm, serenity and tranquillity, it gives the mind, it becomes the most powerful of all the means of health and long life." The idea is twice repeated. "In uncommon or complicated diseases, or where life is more immediately in danger, I again advise every man without delay to apply to a physician that fears God." In his third preface, Wesley used a word that has been a motto ever since throughout the Methodist connection; to remedies the effects of which he had himself observed, he added "*tried.*" Also he insists on the application of electricity as a remedial agent: in the Appendix, no less than 37 diseases are declared to yield to its influence.

The collection of receipts are more curious than useful, they are not equal to the average of such compilations. "*For an Ague.* 8. Make six middling pills of cobwebs. Take one a little before the cold fit: two a little before the next fit: the other three, if need be, a little before the third fit. I never knew this fail. *Cholera Morbus.* 131. Drink two or three quarts of cold water, if strong; of warm water, if weak. 132. Or, boil a chicken an hour in two gallons of water, and drink of this till the vomiting ceases." This would excuse the man, who during the outbreak of this pestilence at Paris, sold half-ounce bottles of distilled water at a franc a-piece, upon the Pont-Neuf.

We next come to Dr. Dovers's successful treatment of Consumption. "Mr. Masters, of Eversham, was so far gone that he could not stand alone. He was advised to lose six ounces of blood every day for a fortnight, if he lived so long; and then every other day; then every third day, then every fifth day, for the same time. In three months he was well. *Tried.*"

Wesley, however much the above may be called in question, describes three eye-waters, the third of which is prescribed occasionally now; and we wonder that in these days of advertisements no one has brought it out as a patent medicine. Moreover, it is efficacious, and to it we can add, *tried.* The first is—"(303.) Heat half an ounce of Lapis Calaminaris red hot, and quench it in half a pint of French white wine, and as much white Rose Water: then pound it small and infuse it. Shake the bottle when you use it. It cures soreness, weakness, and most diseases of the eye. I have known it cure total blindness."

The form still used is—"(305.) Boil very lightly one spoonful of white copperas scraped, and three spoonfuls of white salt, in three pints of spring water. When cold, bottle it in large vials without straining. Take up the vial softly, and put a drop or two in the eye morning and evening." To the surprise of the writer of these lines, he has been in the habit of preparing an eye-lotion without being aware that he was indebted to Wesley's pages for its origin. "306. An eye-water which was used by Sir Stephen Fox, when he was 60 years of age, and could hardly see with the help of spectacles; but hereby in some time recovered his sight, and could see to read the smallest print without glass or spectacles, till above 80. Take six ounces of rectified spirit of wine, dissolve it in one drachm of camphor; then add two pugils of dried elder flowers. It is used as an embrocation for the forehead and eyelids."

Powdered Assarabacca is *Major's* snuff. We pass over a large quantity of receipts, expressing astonishment that they should have found favour. The gout is to be cured by the application of a raw lean beef-steak (368); while for the iliac passion, Sydenham orders a live puppy to be held constantly on the belly (431)—a singular mode of giving bark; while rupture in children (588) is treated by boiling a spoonful of egg-shells dried in an oven, and powdered, in a pint of milk to three quarters of a pint. Feed the child constantly with bread boiled in this milk. What shall we say when for green sickness, we are gravely instructed to take an ounce of quicksilver every morning; while for twisting of the bowels, one, two, or three pounds of quicksilver in water, are suggested. Our age has taught us better things.

Experience and common sense are the handmaidens of abstract science. Wesley forgot that though a rudder may be a most sensible invention, it requires a skilful hand to guide it. Nevertheless, he can well forgive a passing smile, for there is no man who has lent a stronger impulse to religious intelligence and activity than the author of Primitive Physic.

JOSEPH INCE.

One hundred volumes were included in this collection: those only were noticed of special interest. Mr. Ince, in conclusion, paid a well-deserved compliment to Mr. Tilden for his energetic and successful aid.

UNIVERSITY OF DURHAM COLLEGE OF MEDICINE.

NEWCASTLE-ON-TYNE, 1870–71.

The Winter Session commenced on Monday, October 3, when the Very Reverend the Dean of Durham, Warden of the University, presented the scholarship and prizes to the successful candidates. The successful students in Pharmacy were—Henry Melhuish (silver medal and 1st certificate of honour), George Foggon (2nd certificate of honour); in Practical Chemistry, C. W. Wilson (medal and certificate of honour); in Botany, John Murray (medal and 1st certificate of honour), William Johnson (2nd certificate of honour); in Materia Medica, John Murray (medal and certificate of honour), William Johnson (2nd certificate of honour).

The Warden and Senate, desirous of adding to the facilities of medical students, and of promoting pharmaceutical education, last year instituted a lectureship on pharmacy.

The curriculum for students in pharmacy consists of attendance on lectures on botany, materia medica, chemistry and pharmacy. The lectures on the two former of these subjects are delivered in the summer, and those on the two latter in the winter session of study.

The Chair of Pharmacy, which was specially instituted for pharmacy students, is held by Barnard S. Proctor, Esq.; the other portions of the pharmacy curriculum being obtained by their attending the courses instituted for the medical students, the respective lecturers in which are, Botany—J. Thornhill, Esq., and W. C. Arnison, Esq., M.D., M.R.C.S.; Materia Medica—Thomas Humble, Esq., M.D., M.R.C.P.; and Chemistry—A. Freire-Marreco, Esq., M.A.

The order in which students in pharmacy attend the several courses of lectures is optional, but as the study of materia medica and pharmacy involves the application of knowledge acquired from the courses on botany and chemistry, it is recommended that the following order be adopted as far as circumstances admit:—botany, chemistry, materia medica and pharmacy.

The course on practical pharmacy includes—general processes and physics applied to pharmacy—pharmacopœial processes and the most important recent improvements in pharmaceutical preparations—dispensing operations—testing and the test solutions of the Pharmacopœia—and is illustrated with apparatus, experiments, and processes in operation.

FEES.

	£.	s.	d.
Perpetual ticket for pharmacy curriculum....	6	6	0
(This applies only to students at present engaged in pharmacy, and who enter before October, 1871.)			
Separate courses of lectures ....each	4	4	0

The perpetual ticket entitles the holder to attend the lectures on botany, chemistry, materia medica and pharmacy, and to use the Museum of Materia Medica in the Library of the College.

At the end of each Session, a silver medal and certificates of honour, if merited, will be awarded, after examination, to the best students in each of the following classes, viz. pharmacy, (practical) chemistry, botany, materia medica.

MEETING FOR THE ENSUING WEEK.

THURSDAY, *London Chemists' Association, at* 9.30 P.M. "The Double and Triple Salts in General Use." By Mr. M. BELL.

Parliamentary and Law Proceedings.

THAMES POLICE COURT, *October 11th.*

BEFORE MR. PAGET.

Susan Denman was charged with swallowing a quantity of laudanum with intent to commit suicide. On Monday evening the prisoner entered the station-house in Arbour Street East, and said she had purchased threepennyworth of laudanum and swallowed it. She appeared in a very bad state, and was immediately conveyed in a cab to the London Hospital, where the stomach-pump was used and the poison dislodged. She had taken enough laudanum to kill half-a-dozen persons. Mr. Paget asked where she had obtained so much laudanum. The prisoner replied at the shop of a chemist and druggist in Stepney, and she could get as much more if she required it. Mr. Paget said this must be looked to by the police. The prisoner, who said she was tired of her wretched existence, and had bought the poison with the intention of destroying her life, was remanded for a week.—*Times.*

BIRMINGHAM POLICE COURT, *October 5th.*

A wholesale chemist, Mr. Frederick Green, carrying on business in Weaman Street, Birmingham, was summoned under the Petroleum Act, for keeping petroleum stored on his premises within fifty yards of a dwelling-house, without having a licence. An inspector visited the shop and found several casks of the oil, some four-gallon canisters packed in boxes to be sent away, and about 50 or 60 gallons in a cistern; altogether about 400 gallons. For the defence it was stated that Mr. Green had applied for a licence to the Town Council, but it had not yet been granted. He thought he could sell in the meantime. A penalty of £15 was imposed, with costs.—*Liverpool Daily Courier.*

Obituary.

AUGUSTUS MATTHIESSEN, F.R.S., was born in London, 2nd January, 1831, and died 6th October, 1870, under very painful circumstances. He occupied the Chemical Chair at St. Bartholomew's Hospital, and at the time of his death was one of the most distinguished and most promising chemists in the country.

His earliest chemical work, now of about fourteen years' standing, was devoted to an investigation of the method of preparing the metals of the alkalies and alkaline earths by electrolysis; this was carried out in the laboratory of Bunsen in Heidelberg. He was the first to isolate the metals calcium and strontium, which he found to be yellow, as well as very malleable and ductile.

A most laborious and protracted investigation into the conductivity of metals and alloys was also begun in the laboratory of Kirchhoff about the same date. This was continued in his own laboratory in London during several years; the results being recorded in nine papers published in the *Transactions of the Royal Society.*

Some years ago, in conjunction with Mr. Foster, he executed a brilliant piece of work on the constitution of narcotine, from which iodide of methyl was procured by means of the action of hydriodic acid. The real structure of narcotine seems to have been disclosed by this investigation.

His recent labours on the alkaloids of opium, on morphia and codeia, are also calculated to throw light on the constitution of the natural alkaloids. They have, moreover, furnished a new therapeutical agent, viz. "apomorphia," which promises to be of some degree of importance in medicine. In his last researches he was joined by Mr. Wright.

Dr. Matthiessen was elected a Fellow of the Royal Society some years ago. Last year he received a Royal Medal for his researches on metals and alloys. He was likewise one of the editors of the *Philosophical Magazine*, and was last year appointed to an examinership in the University of London.

Conservancy of the Thames.—An important step has now been taken towards the ultimate purification of the Thames. The Twickenham Local Board have been informed by the Thames Conservators that effluent sewage water discharged into the Thames must not contain more than 3 gr. of suspended and 70 gr. of soluble matter, nor more than $2\frac{3}{4}$ gr. of organic matter (2 gr. of carbon and $\frac{3}{4}$ gr. of nitrogen). This standard is to be universally adopted in the case of all towns and villages draining into the Thames.—*Lancet.*

The following journals have been received:—The 'British Medical Journal,' Oct. 8; the 'Medical Times and Gazette,' Oct. 8; the 'Lancet,' Oct. 8; 'Nature,' Oct. 6; the 'Chemical News,' Oct. 7; 'Journal of the Society of Arts,' Oct. 6; 'Gardeners' Chronicle,' Oct. 8; the 'Grocer,' Oct. 8; the 'English Mechanic,' Oct. 8; the 'Produce Markets Review,' Oct. 8; the 'Archiv for Pharmaci og technisk Chemi med deres Grundvidenskaber,' for January to June, from Mr. S. M. Trier of Copenhagen.

Notes and Queries.

⁂ *In accordance with a wish expressed by numerous correspondents, a column will in future be devoted to notes and queries, with the object of facilitating the exchange of information among members of the trade and students.*

I should be glad to have, through the columns of the Journal, an experienced dispenser's opinion as to how he would prepare and send out the following prescription:—

℞. Acid. Gallici ʒiij
Sp. Vini Rect.
Aquæ Rosæ, aa ℥v
Misce, fiat solutio.

To be used as directed. W. M.

Will any subscriber inform me how I may mount microscopical objects, especially sections of leaves, wood, etc.?
R. J. M.

Are chemists and druggists having more than one shop for the sale of patents compelled to take out separate licences for each? T. MARSHALL.

"*Cymri*" desires to learn by what means he can dissolve ordinary isinglass without acid, so as to fit it for brewers' finings, in the manner of Coleman's Tasteless Beer Finings.

"*Botanist*" desires to be informed where he can procure the proper paper for mounting "dried specimens;" also labels with the words, Tribe, Habitat, Date, etc., printed on them with places to be filled in.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the Editor, 17, *Bloomsbury Square.*

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

"Help for Students!"—Pharmaceutical Education in the Provinces.

Dear Sir,—At the recent Liverpool Conference two papers were read, and a lengthened discussion arose on the "educational question." It was my privilege to be present as a delegate, and to listen to the observations of our worthy President and other gentlemen whom we have long esteemed for their intelligence and earnest efforts to promote the elevation and best interests of our body. I quite agreed with the various speakers that no subject in connection with our association is deserving of more careful consideration than the training and education of the young men, who will in due time become our successors and the future chemists of this country. In every branch of society these questions are receiving more universal attention, and increased facilities are being offered for thorough mental culture.

We, therefore, on whom so much responsibility devolves, must not be behind the age in vigilance and activity in these matters. Already special privileges have been accorded to us by Government, but in conjunction therewith additional duties also devolve upon us, viz. to protect the public against accidents through ignorance and the incautious use of dangerous and powerful medicines. The prolonged controversy and correspondence which have taken place on the "Poisons" question may be cited as a proof that we are fully alive to the responsibilities of being entrusted with the safe storage and dispensing of deadly and hazardous drugs. It seems almost impossible by any simple arrangement of chemists' establishments to avoid the possibility of accidents, neither would it be agreeable to gentlemen of liberal education and experience to subject the details of their business to the inspection or dictation of others, probably less conversant with its requirements than themselves; at the same time we are all, I think, agreed that a systematic and complete course of education is of vital importance, and that this is the best guarantee for safety we can offer to the Government and the public at large.

The question therefore arises, "How can this be most effectually encouraged and carried out?"

From long experience I may venture to say that, as a class, the young men entering and engaged in the drug business are as thoughtful, intelligent and diligent in the pursuit of knowledge as those in any other department of business or science. Many, in their earlier days, had not the advantages which are now offered; and we owe much to the founders and various members of the Pharmaceutical Society for the example and stimulus they have given. We revere the memories of Allen, Bell and other noble pioneers of the past. Much, however, still remains to be done. The Society is well represented by the learned and able members of the Council for the present year; and we rejoice to see that so many young men are coming forward each season to compete for the prizes and to pass the examinations. It involves no little amount of energy, application and self-sacrifice for those who are in most cases closely occupied with business all day, to find the time (often wrested from the hours of sleep) to pursue the course of study necessary for success.

I believe the very struggle will itself be a good thing for those young men in years to come, teaching them the importance of industry, perseverance and economy of moments; but at the same time I would say that there is a word we might use and perhaps carry into practice with good effect for all parties, that word is "Sympathy." How often it cheers the drooping spirit and reinvigorates relaxing energies! I have generally found that the diligent student at nights is also the most active and faithful apprentice or assistant during the day, and thus becomes more valuable to his master. A word of kindly encouragement now and then,—the offer of more time for reading when the day's work and duties are over, or half an hour for study during the day,—often stimulates and creates a genial reciprocity of feeling. A youth thus taken into the business and treated as a son, generally grows up thoughtful and steady, and proves a comfort and a credit to the house with which he was connected. Pleasing remembrances of this character can never be forgotten; and while it is thus desirable that mutual sympathy should be cultivated in the family circle and business establishments, I think the same principle might with profit be applied to our Society at large. I believe all those who joined in the recent Conference, felt cheered and highly gratified by the hearty welcome and generous reception they met with at the hands of their Liverpool friends. We went as it were with tears (for the first day was very wet), but we certainly returned again "rejoicing," having also assisted the Liverpool Chemists' Association to celebrate its "majority." The same feeling of sympathy often leads members and associates in the country to look with affection and interest to the parent Society,—to you, our fathers and seniors in the metropolis. Some of us, however, have watched and assisted the Society even from its commencement. I well remember (a youth, as I then was, just entering the business) with what zest we received and read the first numbers of the new Pharmaceutical Journal, and thinking the objects it sought were very good, I joyfully sent up my first half-guinea as an associate more than twenty-eight years ago; yet my interests and sympathy have never declined, and though it has cost me now some £25 to £30, I have always been glad to contribute my share to its support. As "children," therefore, we in the provinces have been faithful to our "parent" in the capital. I am happy, too, to find that your resources are increasing, and that last year £500 was able to be set aside for the "Benevolent Fund"—a noble institution, and that you are also in so good a pecuniary position as to feel justified to devote other sums as bonuses to indicate your appreciation of long and valuable services, and I have confidence that the members at large (when appealed to) will support any right expressions of gratitude for help and sympathy thus rendered to the association.

In reflecting upon the present income of the "Pharmaceutical Society" I have occasionally asked myself how its funds, a considerable proportion of which are derived from the provinces, might be turned to the best account. Before a chemist can obtain the diploma (and I would urge each young friend to determine on taking the highest position), the sum of ten guineas will have been paid, in the three separate fees of two, three and five guineas each. In the case of many whose first resources are but limited, this is no trifling consideration, apart from the expenses of books, classes, hours of study, etc.

Now how can we best assist and show our "sympathy" for these laborious students, especially for those who reside in our smaller towns, and therefore have not all the advantages which London and other cities or larger towns afford? Your interest and desire, I may fully presume, would be to encourage and secure young men of character and ability, and help them to elevate themselves to higher social positions, and none is nobler than that of a "pharmaceutical chemist." I therefore beg respectfully to suggest that wherever a chemists' association is established in a town or neighbourhood, principals, assistants, and apprentices uniting to commence a library, museum, reading-room, etc., and to raise, say £10, £20, or £50 amongst themselves, that the parent Society (*i. e.* our London friends) should kindly offer an equal amount, or at least some stated sum in proportion to that which they may raise. It would thus stimulate local effort, and be a suitable return for the subscriptions some of us have for so many years been forwarding and still forward to you. There are about twenty-five associations already formed, and on their behalf I beg most respectfully to make this proposition,—trusting you will bring it before the President and Council for their consideration and approval. While helping to scatter abroad the seeds of knowledge, they also will ultimately realize an "abundant harvest."

Believe me, dear Sir, yours faithfully,

W. Bostock, *Local Secretary.*

Ashton-under-Lyne,
September 30th, 1870.

Prison Compounders.

Sir,—In an unfair fight the bystanders generally interfere; will you act that part between Parliament Street and us poor compounders?

The army and navy compounders have lately been recognized; how is it that the convict service has been passed over? or in a prison of 1600 men the "*dispensing*" (*sic*) is allowed to be done by some of the warders (as for some years past), who receive no extra pay for thus keeping another officer out.

In conclusion, I beg to call your attention to the terms offered to any young man anxious for "*service.*" He must submit himself to the Civil Service Commissioners for examination, and to a duly appointed person for examination in pharmacy, and to two or three medical men as to bodily health; and after, perhaps, three months waiting, he is appointed, and will receive £57 per annum, reaching to £72 in ten years, with an allowance of 2*s.* per week for lodging, and 7*s.* per week for board in lieu of living in the prison; and for the better information of the public, they mark you as an atom of the broad arrow, by clothing you in blue and brass buttons. There being no chance of promotion, as in the army and navy, where more are employed, could they not honour us with the title of Dispenser?

I am yours, etc.

Parkhurst Prison. Broad Arrow.

"Extra Charges after or before Business Hours."

Sir,—The question as to the advisability of making extra charges on anything purchased after or before business hours, is one which ought to be more generally considered, and many will be glad to see that the subject has been started in the Journal by your correspondent Mr. Jessop.

The idea has often occurred to me that an extra charge of at least 25 per cent. should be exacted on the articles procured from chemists' establishments on Sundays or after hours on the other days of the week.

I think if the subject were fairly laid before the public they would see the justice of such action, for those who really need medicine at such times would not object to an additional charge; whereas others who come at such hours not urgently requiring physic, should be made pay for the needless trouble and labour they give.

I am, Sir, yours obediently,
Kappa.

Sir,—It was with much pleasure that I saw in your last impression a letter on "extra charges after business hours." It is the custom here, and I believe our rule is not an exceptional one, to charge half-a-crown if called up after eleven at night or early in the morning; and this has effectually put a stop to what otherwise might have become an intolerable nuisance.

That a man should have to leave his warm bed to supply, at the usual prices, "antibilious pills," paregoric, soda water, or any other such article, to people who only consult their own convenience in the matter, is, I think, positively humiliating to those who passively submit to it.

This subject reminds me of another which I should like to see reformed, viz. "Sunday trading." I think most of my *confrères* will agree with me, that a great proportion of the articles sold on Sundays are either absolutely unnecessary, or might, by the exercise of a little foresight, have been obtained on the preceding Saturday night. I am of opinion that it would be well if chemists were to charge, say, 25 per cent. on every article so supplied; and such extra charge would, I hope, be devoted, in the majority of cases, to our "Benevolent Fund."

Let us all strive to make Sunday, as far as possible, what it should be, a day of rest.

I remain, yours respectfully,

Sept. 24th, 1870. T. H. P.

Hospital Dispensing.

Sir,—Allow me to correct a misapprehension existing on the part of Mr. Edward Barber, a hospital dispenser of sixteen years' standing, as to the purport of my recent note. I distinctly drew attention to the mode in which the prescription was dispensed, and made no attack upon the use of private formulæ or quality of the drugs supplied. The sneer conveyed in his remark, "a patient's *greasy* card," is not pertinent, for this was a freshly-written prescription. I also remind Mr. Barber that it is nonsense to offer a puzzle of professional ciphers in his postscript, as he had previously informed your readers "the prescriber knows very well that it is intended only for his own dispenser, and that he will understand it."

In conclusion, I repeat my conviction that the law to be equitable must eventually place the storing and retailing poisons, as well as matters relating to pharmacy and dispensing, whether conducted by the surgeon, charity or dispensing chemist, under the control of the Pharmaceutical Council, freely and indifferently elected by its own constituents.

Robert Owen Fitch.

Well Street, South Hackney,
September 9th, 1870.

Dear Sir,—The letter of a "Pharmacist" is certainly not one of the most complimentary to those whose duty it is to dispense the medicine prescribed by the physicians of public hospitals and dispensatories.

In the first place, I will thank "Pharmacist" to explain what he means by an "average type of hospital dispensing" or his "waste of public money." Let him ask himself whether if the authorities of these benevolent institutions thought it a waste of money, they would keep it on? In respect to the labelling of the medicines, "Pharmacist" must not take St. Bartholomew's as a pattern. He must understand that every hospital or dispensary standing upon its own basis has its own way of doing things.

I think I may safely say that nine out of ten dispensers would take the trouble to stick the labels on the bottles, and also to adjust the corks in a more decent and proper manner. Perhaps if the details of the case that "Pharmacist" mentions came to be thoroughly sifted, only about a fourth part of that which "Pharmacist" asserts would be found to have really taken place, and that there was no necessity for putting him to the trouble of discerning between a mixture and a gargle.

Ebenezer S.

London, September 28th.

Pharmaceutical Titles.

Dear Sir,—I passed the "Minor" the latter part of last Session, and at that time had no intention of attempting the "Major," for the simple reason, I thought the title "Pharmaceutical Chemist" scarcely worth the trouble to obtain it. Seeing some of your readers are agitating on "Pharmaceutical Titles," and feeling sure the Council will help us in the matter, I have changed my plans, now purpose becoming an "Aspirant for the Major," and hope to have the pleasure of chatting over the subject with the gentlemen who have written under that name, during the coming session at Bloomsbury Square.

I think "Omega" in his letter of the 17th instant is scarcely going the nearest way to promote reform; grumbling at what has been done is certainly not the best course to pursue, nor do I think he shows his "brotherly love" in endeavouring to ridicule the diplomas of a Society to which he pays an annual subscription.

Hoping steps may be taken to bring the subject of "Pharmaceutical Titles" prominently before the Council,

I am, dear Sir, yours faithfully,
Spes.

Sir,—Your correspondent "Omega" seems to be labouring under a mistake with regard to the motive which influenced me (at least) in taking up the subject of "Pharmaceutical Titles."

That there is any wish in my mind to "parade my intellectual status before the eyes of my *confrères*" I most emphatically deny; in fact, there is no need for such a desire. Those who are connected with our business are already fully aware of the exact worth of the existing titles, and if the public were equally well informed the necessity for an addition to the means of distinction would be obviated. That they are not so becomes to me more and more apparent, and the wish that they should be made so increasingly urgent.

But though I do not wish to parade the "Major honours" (which I hope to attain) for the sake of "parading," and though I do not look to "F.R.C.P.G.B." as the only reward for my future attainments, I do candidly admit that one of the motives which induced my longing for an amendment in the present state of affairs is "*£. s. d.*"

This may be thought a very mercenary reason for any action connected with a scientific subject, but whilst pharmacy continues a "business," "*£. s. d.*" must be a consideration, and a very important one, to those concerned in it.

As I tried to express in my former letter, it is the manifest injustice of allowing "Modified" gentlemen to reap equal advantages with "Majors" of which I complain, and that injustice I hope to see before long swept away.

As to showing "brotherly love" toward our "Modified brethren," I think a reperusal by "Omega" of my letter of August 20th will show that I wish to see all fairness done to them as to the other members of the community, though I cannot help thinking that they already enjoy their share of title, for if they wish no higher test of their knowledge than the "very modified curriculum" they surely ought to be (and doubtless, being of "retiring dispositions," are) satisfied with what they already possess in "Chemist, by examination of the Pharmaceutical Society."

But "Omega" goes on to complain that those who have passed the Modified Examination do not possess a "grand flaming diploma" to show for their success. Now, of course he cannot be speaking the minds of those gentlemen themselves, for they, being of a "retiring demeanour," would by no means wish an opportunity for "parading" their attainments, so he must of necessity be judging them incorrectly in one or the other particular when expressing himself in this manner.

I am glad to see that he joins with me in counselling "agitation" as the great means for success in this point, which "agitation," however, has been very poorly shown up to the present time by the numbers who I am sure are desirous of a reformation in these matters.

I am, Sir, yours obediently,
"An Aspirant to the Major."

Poisonous (?) Feeding Bottles.

Sir,—I wish to bring under your notice a rather singular statement in a letter which has appeared in the *Leicester Chronicle and Mercury*, and to ask the opinion of those more experienced than myself whether they consider it possible for such a poisonous action to take place. Speaking of the now prevalent use of feeding-bottles the writer (Dr. W. L. Emmerson) says,—

"Unfortunately the caoutchouc or india-rubber decomposes the warm milk very quickly, and a poisonous compound remains. Nurses are often surprised when the cork is removed and the offensive gas escapes; but they are seldom aware of the mischief which the poisonous milk is effecting, and it is often too late when the medical man is called to supply a remedy. I have often been grieved to see children suffering from this cause, and alas, in many cases, the patients were so reduced by diarrhœa and blood-poisoning that death was inevitable."

I can only think that the "poisonous compound" mentioned by the doctor is *sour milk* arising from a want of cleanliness in not well-washing out and cleaning the tubes before use. As it is a rather serious charge against the tribe of "Feeders" now so much in vogue, I lay the letter before your readers and am

Yours, etc. C. B. N.

Advertising by Postage Cards.

Sir,—I think it high time for the retail trade to adopt some effectual means for arresting the evil of wholesale houses making the public at large acquainted with trade prices. I allude to the advantage that is taken of the halfpenny postage cards for advertising (more especially) articles for the toilet. Since its adoption on Saturday last I have received three of these cards, two of the same not only with trade prices affixed, but stating extra allowances if a certain quantity is ordered at one time.

I may add that one of the preparations is, comparatively speaking, a new article in the market, and, in my opinion, the proprietor could not possibly have put a more effectual obstacle in the way of the retail trade introducing and recommending the articles to the notice of their customers than by advertising in this public manner both the retail and wholesale prices.

I remain, Sir, yours faithfully,
Newnham, October 5th. A Country Chemist.

Sale of Poisonous Materials.

Sir,—In this district a large quantity of sulphate of copper is used for *dressing* wheat. This trade is being done to some extent by grocers, who send out the article with no label, and, of course, at sometimes a penny per pound cheaper than the chemists. This is obviously unfair,—is it legal? These men would rather not sell the more virulent poisons; customers who ask for them are referred to the nearest druggist, while the provision dealer, happy in having no responsibility, pockets the profits accruing from the sale of senna, Epsom salts, castor-oil, and a variety of articles certainly not in the category of provisions. If the Pharmacy Act gives the pharmacist and the druggist a greater responsibility, it should also give him protection. Sulphate of copper looked at in the light of *sugars*, and retailed at $3\frac{1}{2}d.$ per pound, is derogatory to the dignity of the beautiful crystal, and the people who vend it are treading on our corns. Can you give me the remedy?

Yours, etc.,
October 4th, 1870. Breasting the Hill.

Pharmacy and Medical Practitioners.—We have received a letter from Mr. George Mee, stating that in consequence of only a portion of a former communication having appeared in the Journal of last week, his meaning is liable to be misinterpreted. He thinks that chemists cannot appreciably lower their charges, and that this is never done without a corresponding deterioration in the skill and materials employed. If practitioners made their attendance more valuable, they would order less medicine; and in good neighbourhoods, where practitioners have given up their dispensing, not a tithe of the medicine has been prescribed, without any loss of *prestige* on their part.

[*⁎* From want of space we are unable to print the letter entire.—Ed. Ph. J.]

An Assistant (Thirsk) complains that some chemists do not make the tinctures, etc., which they sell retail, according to the B. P., and thus are enabled to undersell others who do. He suggests that the liability to a penalty of £5 for not making up prescriptions according to the B. P. should be extended, and that before going any further with the poison question, steps should be taken to secure a uniform strength for all tinctures, spirits, etc.

J. H. Baldock.—Our correspondent's letter does not contain anything that is not thoroughly well known and appreciated, and since his arguments do not seem relevant to the subject he refers to, the publication of his letter would be on all grounds undesirable.

J. Bingley (Northampton).—We believe that the hydrated chloride of aluminum is being introduced by Messrs. Bolton and Co., Holborn Bars.

"*Young Dispenser*" (Oldham) should apply at the War Office.

"*Spero.*"—(1.) The examinations must be passed separately. (2.) Bentley's 'Manual of Botany' will be ready in a few days. (3.) At a herbalist's. (4.) Either would probably suit. (5.) Yes, if properly studied.

T. L. (Everton).—We do not know of a work so comprehensive that is published at so low a price.

An Apprentice of the Society (Bromley).—There is danger of an explosion while rubbing up chlorate of potash with any organic substance.

J. Thompson (Liverpool) should apply to the Excise Commissioners at Somerset House.

"*Cymri*" (Chester).—There is a work by Mulder on wine, but not, that we are aware, one on beer.

Andrew Barfoot (Leicester).—An article will shortly appear on the subject referred to, so far as is consistent with its treatment in a pharmaceutical journal.

G. B. (London).—The Botanical Exchange Club, of which Dr. J. Boswell Syme is the Curator. A copy of the last Report and the Regulations of the Club might be obtained by applying to the Secretary, Dr. Trimen, 71, Guilford Street, Russell Square.

Communications, Letters, etc., have been received from Mr. F. B. Benger (Manchester), Dr. Divers (London), Mr. T. B. Groves (Weymouth), Mr. A. H. Mason (Liverpool), Mr. Houlton (Witherby), Mr. F. M. Rimmington (Bradford), Mr. W. W. Stoddart (Bristol).

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

THE LOSS OF SPIRIT IN MAKING THE TINCTURES OF THE BRITISH PHARMACOPŒIA.

BY C. UMNEY, F.C.S.

As a considerable portion of a pharmacist's time is necessarily occupied in the preparation of tinctures, any subject connected with their production must always be of interest to him. To those who have little opportunity of making laboratory notes, the record of the loss of alcohol (in its officinal forms of proof and rectified spirit) entailed in the manufacture of tinctures, may be of service; and even to those who possess such memoranda of their own, the perusal of the preceding schedule may be interesting.

	Quantity made.	Alcohol ·838 to make up measure.	Alcohol ·920 to make up measure.	Loss p. c. by volume.	Gain p. c. by volume.
	Gals.	Pints.	Pints.		
Tinct. aconit.	4	2·5	......	7·9	
„ arnicæ	10	3·0	......	3·8	
„ aurantii	10	......	5·0	6·3	
„ belladonnæ	2	......	·7	4·1	
„ benz. comp.	5	......	......	......	10·0
„ buchu	2	......	1·0	6·3	
„ calumbæ	5	......	3·0	7·1	
„ camphor. comp.	10	......	·5	·7	
„ cantharid.	4	......	·6	1·9	
„ capsici	5	1·0	......	2·5	
„ cardam. co.	20	......	......	......	2·5
„ cascarillæ	5	......	2·0	5·0	
„ castor	2	·5	......	3·2	
„ catechu	5	......	no loss	......	
„ chirettæ	2	......	2·0	12·5	
„ cinchonæ	10	......	12·0	15·0	
„ „ co.	10	......	9·0	11·3	
„ cinnam.	5	......	4·0	10·0	
„ cocci	1	......	·25	3·1	
„ colchic. sem.	2	......	1·5	9·4	
„ conii	2	......	·75	4·6	
„ croci	1	......	·6	7·5	
„ cubebæ	2	·5	......	3·2	
„ digitalis	5	......	3·0	7·5	
„ ergotæ	2	......	2·0	12·5	
„ ferri acet.	1	1·2	......	15·0	
„ gallæ	1	......	·4	5·0	
„ gent. co.	10	......	7·0	8·7	
„ hyoscyam.	10	......	6·0	7·5	
„ jalapæ	5	......	2·0	5·0	
„ kino	1	no loss	......	......	
„ krameriæ	5	......	2·0	5·0	
„ lavand. comp.	20	2·0	......	1·3	
„ limonis	2	......	1·5	9·4	
„ lobeliæ	3	......	2·5	10·5	
„ „ æther.	3	*3·5	......	14·5	
„ lupuli	5	......	4·0	10·0	
„ myrrhæ	5	2·5	......	6·2	
„ nuc. vomic.	4	2·0	......	6·2	
„ opii	10	......	·75	1·0	
„ „ ammon.	2·5	·5	......	2·5	
„ pyrethri	1	1·0	......	12·5	
„ quassiæ	1	......	·7	8·7	
„ rhei	10	......	4·0	5·0	
„ sabinæ	2	......	·8	5·0	
„ scillæ	5	......	3·0	7·5	
„ senegæ	1	......	·75	9·3	
„ sennæ	10	......	2·0	2·5	
„ serpentar.	1	......	·9	10·9	
„ stramon.	1	......	·5	6·3	
„ sumbul	3	......	1·0	4·2	
„ valerian. am.	5	†3·5	......	4·4	
„ valerian.	5	......	2·3	5·7	
„ veratr. virid.	2	2·5	......	15·6	
„ zingiberis	5	2·5	......	6·3	
„ „ fort.	10	3·6	......	37·5	

* Sp. æther. sulph. † Sp. ammon. aromat.

It must always be remembered that the quantity of spirit required to make the measure of tinctures to a given bulk, will only be strictly uniform, in so far as the operators proceed under precisely the same circumstances.

No causes will be found to influence results more than the manufacture of tinctures upon a small as compared with a large scale, and the use of the screw as contrasted with the hydraulic press, in the final removal of the spirit from the marc; even the difference between the temperature of summer and winter may cause a variation in the results.

The loss of alcohol noted in these tinctures has not been the subject of special experiment, but merely the memoranda made in the ordinary routine of manufacture. It may be well to remark that hydraulic pressure has always been used for the recovery of the spirit, when the quantity of ingredients has been sufficiently large to admit of its application.

	Gals.	Menstruum required p. c. by volume.	Ingredients occupy when in solution, filtered, and made to prescribed volume.
Tinct. aloes	3	95	5 p. c. by vol.
„ guaiac. am.	3	92·7	7·3 „
„ tolutani	2	93	7 „

In those tinctures in which the ingredients are directed to be macerated in a portion only of the spirit, and the measure finally made up when their solution has been effected, the percentage volume such ingredients occupy when dissolved and filtered has been determined; the difference therefore in volume will be the amount of menstruum required to produce the exact measure. To the tinctures directed to be thus made in the Pharmacopœia, the compound tincture of benzoin might have been added, as a considerable augmentation in volume is produced by using the whole of the alcohol for maceration.

Laboratory, 40, *Aldersgate Street, E.C.*

TESTING OF BITTER ALMOND OIL AND OIL OF CLOVES.*

BY F. A. FLÜCKIGER.

Since the foundation of the anilin dye industry, nitro-benzol, or oil of mirbane, has become a readily obtainable substance, costing no more than one-twentieth as much as the true bitter-almond oil, which it resembles in many characters. For some purposes there is, in reality, little more reason for objecting to the use of nitro-benzol than to the use of crude bitter-almond oil containing prussic acid. Existing toxological experience has proved nitro-benzol to be a narcotic poison, though it is scarcely more dangerous, on the whole, than bitter-almond oil.† Every now and again the problem of distinguishing these two liquids comes forward in phar-

* Abstract from the author's paper.

† Compare Husemann, Supplement to the 'Handbuch der Toxicologie,' 1867, p. 118.

maceutical literature, and for that reason the author deems the publication of the following remarks to be appropriate.

There is no difficulty in distinguishing between bitter-almond oil and nitro-benzol when these substances are pure and unmixed. The specific gravity of bitter-almond oil is from 1·04 to 1·044, or at the utmost 1·075;* that of nitro-benzol is 1·20 to 1·29, so that Wagner has based on this difference a method of determining the amount of nitro-benzol in bitter-almond oil. If at the same time advantage be taken of the solubility of the aldehyde in a solution of bisulphite of soda, it is possible to effect an approximatively accurate separation of bitter-almond oil from nitro-benzol, leaving prussic acid out of account.† However, it is but seldom that a quantitative determination is needed; more frequently the mere detection of nitro-benzol is alone requisite, and this must be attempted before the application of Wagner's method, by means of some characteristic reaction. Reactions of this kind have been suggested for the purpose by Maisch and Dragendorff. The former relies upon the conversion of nitro-benzol into a brown resin by alcoholic solution of potash, and the conversion of bitter-almond oil into benzoate of potash by the same reagent. Dragendorff has shown that these substances behave differently with sodium, —nitro-benzol becoming dark-coloured, while bitter-almond oil gives white flocks. However, Wagner regards both these methods as insufficient. Flückiger quite agrees with him, and considers that the only reaction worth considering in regard to this subject is the conversion of nitro-benzol into anilin and its coloured derivatives. Some anilin is formed even in Maisch's test, as was shown by Zinin; but much more is formed by treating the nitro-benzol with hydrogen generated by zinc and hydrochloric acid, according to Hofmann's plan, or by iron and acetic acid as Béchamp recommends,—the latter being the plan adopted in manufacturing anilin from nitro-benzol.

Nitro-benzol may be readily recognized by diluting it with alcohol, leaving it in contact with zinc and hydrochloric acid, and, when the evolution of gas has ceased, supersaturating with potash and producing the colour reactions of anilin. It is evident that this method would be applicable for detecting nitro-benzol in bitter-almond oil as well as in other liquids; and, although it has come into use, the author found a want of any statement as to its delicacy, and for that reason he undertook the following experiments. He finds it is not necessary to add alcohol, nor to separate the anilin formed, unless very great accuracy be required. The test is applied as follows: granulated zinc is covered with dilute sulphuric acid (1·11 sp. gr.), adding the oil to be tested, and shaking up well; after about two hours the watery part of the liquid is to be poured on a moist filter. When heating has been prevented, the filtered liquid is colourless. The anilin salt on the filter may be, without further purification, converted in the usual manner into coloured compounds by any of the suitable oxidizing agents. The author recommends chlorate of potash, chromate of potash or perchloride of iron.

On adding to a small portion of the filtrate a few grains of chlorate, a violet colour is produced, or, with small quantities of anilin, a red colour. The chromate produces a blue colour that soon passes into red, brown, dark green; perchloride of iron gives a red coloration. The action of chromate is very delicate; but the chlorate is to be recommended as cleaner. If the latter salt does not react at once, a drop of concentrated sulphuric acid must be added, and the tube left for an hour or so.

By this very simple test 1 per cent. of nitro-benzol may be detected with certainty in bitter-almond oil. The reactions are obtained also when only 1 or 2 grms. of oil containing 1 per cent. of nitro-benzol is operated upon with 10 grms. granulated zinc, and 10 grms. dilute sulphuric acid during 1 or 2 hours. Very intense colorations are produced when the nitro-benzol in the oil amounts to 5 per cent.

However, it is not absolutely necessary to use hydrogen or acids for producing it, in order to convert nitro-benzol into anilin. If bitter-almond oil containing nitro-benzol be mixed with finely divided iron or zinc, and the pasty mixture exposed to a temperature of 100° C. in a closed vessel for some hours or days, the formation of anilin takes place. It is facilitated by the addition of a little alcohol. Afterwards, the mixture is diluted with some alcohol and filtered, the solution containing the etherial oil and the anilin is mixed with some dilute sulphuric acid, so as to obtain sulphate of anilin in solution for testing.

Pure bitter-almond oil treated in this way does not give any colour reactions. When the action of metallic iron or zinc upon the oil has been continued too long, the filtrate obtained after addition of sulphuric acid is rather brownish, but even then chlorate of potash would not produce any blue, red, or green coloration if there were no nitro-benzol present.

Lastly, the author remarks that although a well-adjusted addition of alcohol, as well as nitro-benzol, to bitter-almond oil, would not affect the specific gravity, still 5 or 10 per cent. of spirit would be indicated by the action of fuming nitric acid. Equal volumes of true bitter-almond oil and of this acid mix together without disturbance, while the presence of alcohol would give rise to a violent reaction.

Oil of cloves is so well characterized by its chief constituent, and is at the same time so cheap, that it is not likely to be much adulterated, unless it be with carbolic acid.

If the acid be combined with bases, most of the etherial oils that might have been added as adulterants would be recognizable by the smell they give to the remainder of the oil of cloves. Fat oils would show their presence by reduction of the specific gravity, and, excepting castor oil, by the reduced solubility in alcohol, which dissolves pure oil of cloves in all proportions. In order to detect carbolic acid, the author suggests the following test:—shake from 2 to 10 grms. of the oil to be tested with 50 to 100 times as much hot water, and, after cooling, pour off the clear liquid. Add to a portion of this liquid a drop of ammonia, and then a pinch of chloride of lime. If the oil of cloves contains carbolic acid, the liquid then acquires, on shaking, a greenish colour that passes into blue, and lasts for some days. Pure oil of cloves does not give this reaction. If it be desired to apply this test very delicately, the liquid may be gently evaporated to a small bulk at a moderate heat.—*Schweitz. Wochenschrift für Pharmacie.*

* Gmelin, 'Handbuch,' vi. 15.

† Wagner; Fresenius, Zeitschrift für Analyt. Chem. v. 286.

SYNTHESIS OF OIL OF RUE.*

BY E. VON GORUP-BESANEZ AND FERD. GRIMM.

The volatile oil of garden rue, which had been regarded by Gerhardt and Cahours as the aldehyde of capric acid $C_{10}H_{20}O$, was examined by Williams and Hallwachs, who assigned to it the formula $C_{11}H_{22}O$. Hallwachs, moreover, suspected that it might turn out to be a ketone, and not an aldehyde. This view was maintained by Harbordt, who, working in Strecker's laboratory, showed that it did not undergo oxidation easily, and that it did not yield the acid $C_{10}H_{20}O_2$ on oxidation. According to Harbordt, oil of rue consists of methyl-nonyl ketone $CO\left\{\begin{matrix}CH_3\\C_9H_{19}\end{matrix}\right.$.

The authors have confirmed this formula by preparing it synthetically. They subjected to destructive distillation, at as gentle a heat as possible, a mixture of acetate of lime and caprate of lime in equivalent proportions, and obtained an oil which, on examination, turned out to be identical with the natural oil of rue, and to have the composition $C_{11}H_{22}O$. The equation explaining its production is as follows:—

$$\underset{\text{Caprylate.}}{\left.\begin{matrix}C_9H_{19}CO\\Ca\end{matrix}\right\}O} + \underset{\text{Acetate.}}{\left.\begin{matrix}CH_3CO\\Ca\end{matrix}\right\}O}$$

$$= \left.\begin{matrix}CO\\Ca_2\end{matrix}\right\}O_2 + \underset{\text{Methyl-nonyl ketone.}}{CO\left\}\begin{matrix}CH_3\\C_9H_{19}\end{matrix}\right.}$$

It boils at 223° to 224° C., and has a sp. gr. of 0·8295 at 17·5° C., and forms a crystalline compound with bisulphates. The capric acid employed in the research had been extracted from a specimen of Hungarian fousel oil.—*Abstract from the Neues Repert. für Pharm. von Buchner*, 1870.

ACRIDINE—A NEW ORGANIC BASE.

Græbe and Caro have discovered an interesting volatile alkaloid of the formula $C_{12}H_9N$, on which, from its violent irritating and acrid qualities, they have bestowed the mame *Acridine*. It accompanies anthracene, the hydrocarbon from which artificial alizarine is made, and was discovered during the purification of anthracene. It is one of the most stable organic compounds, being capable of withstanding a temperature of 360° C., which is its boiling-point. It is a colourless crystalline substance, and fuses at 107° C. In ether and in alcohol it is easily soluble. In cold water it is almost insoluble; hot water, however, dissolves it to some extent. It is a strong base, capable of uniting with acids to form salts.—*Journal für Praktische Chemie*, No. 14, 1870.

GLUCOSE.

BY PROF. CHARLES A. JOY.

In the year 1811, Kirchhoff, a celebrated German chemist, discovered that it was possible to convert starch, by means of sulphuric acid, into sugar. Great expectations were founded upon the announcement of the discovery, as, in consequence of Continental wars and the English blockade, sugar had become a very dear article, and it was at first thought that an ample supply could be obtained in this way; but everybody was destined to be grievously disappointed as soon as the subject was more thoroughly investigated, and it was found that the sugar thus produced was of a different character from that to be obtained from the cane and beet. Still, the discovery of Kirchhoff was of great importance, and has led to many practical applications. It was soon found that glucose or grape sugar could be made in several ways, and that it was always the product of the germination of starch grains, and sometimes occurred already formed in nature.

It is probable that both cane and grape sugar are formed from the starch contained in the cellular tissues of the plant, cane sugar being formed first, and then grape sugar, if acids be present. Acidulous fruits contain only grape sugar, whereas cane sugar occurs in those that are free from stronger acids. The chief natural sources of the grape sugar are in the sap of the grape vine, in plums, cherries, figs, honey, in the liver and in diabetic urine; but it would not be economical to prepare it from any of these sources.

One of the latest methods for the preparation of grape sugar is the one proposed by Maubré, and is as follows:—The mixture of dilute sulphuric acid and starch meal is boiled under pressure of six atmospheres. The necessary boilers are similar to those used for high-pressure engines, and are lined with lead and provided in the interior with a perforated lead tube for the passage of steam. The boiler is further furnished with safety-valve, stop-cocks, thermometers, etc. In the process of manufacture 56 lb. of sulphuric acid of 66° B. are diluted with 5600 lb. water, and heated to 212° F. A mixture of the same amount of acid and water is made in a separate wooden vessel, the heat of which is raised to 86° F. Into the second mixture 2240 lb. of starch meal are well stirred and heated to 100° F. This is gradually added to the first mixture, and after heating with open valves for a few minutes to 212° F., the stop-cocks are all closed and the heat raised to 320° F. and continued until all of the starch is converted into sugar, which requires from two to four hours.

The contents of the boiler are then run into a wooden tank, and 168 lb. of pure chalk or carbonate of lime, previously stirred up with 500 lb. of water, is gradually added to neutralize the acid; the gypsum is caught on a filter and the filtrate evaporated to 20° B., and afterwards clarified by blood and bone-black and again filtered. In this way the product is obtained pure, and free from bitter and empyreumatic taste, and is well suited for any of the purposes to which grape sugar is adapted.

Another way is to convert the starch into sugar by means of malt. For this purpose 10 to 12 lb. of barley-malt are well stirred with 400 lb. of water, and to this is added 100 lb. of starch, and the whole is heated to 158° F., and kept at that temperature for several hours, under constant agitation. At 158° F. the starch becomes pasty, the grains burst, and at first there are no signs of sugar, but in a quarter of an hour the liquid becomes more fluid and begins to have a sweetish taste. Great care must be observed to retain the heat at the same temperature, not to have it either higher or lower than above indicated, and to ensure this several thermometers ought to be put in different parts of the apparatus. After six hours the liquor can be filtered and clarified, and evaporated to a syrup. The sugar prepared in this way always retains the taste of malt and is only adapted to use in breweries, where this property will not prove deleterious.

Grape sugar, or glucose, can be prepared in open vessels by allowing a mixture of starch and water to flow gradually at a temperature of 130° F. into a vat containing water acidulated with 1 per cent. of sulphuric acid. By keeping it at a boiling-point the starch is at once altered, without producing mucilage. The amount of starch taken is usually about one-half the weight of water employed. After all of the starch is added, boil for half an hour and decant. The sulphuric acid is neutralized by carbonate of lime as before, and the liquid evaporated to the specific gravity of 1·28, and set aside to crystallize. The molasses is allowed to drain off, and the sugar is dried at a gentle heat in a current of dry air.

In the United States, especially in the west, it is more

* Read at the Royal Bavarian Academy on June 11.

economical to make grape sugar from corn. There are several large establishments where this business is now extensively prosecuted. The corn is steeped in weak soda lye to separate the husk and soften the gluten. It is then ground wet and run through revolving sieves, by which the husks and gluten are separated. The starch flows through long ways and troughs, in which are slats against which the solid particles lodge, and thus separate from the water. The wash water is run into a large cistern, where it can be fermented into weak vinegar. The starch is put wet into a mash-tub and treated with 1 per cent. sulphuric acid in sufficient water for three to eight hours. Where it is intended to make sugar the whole of the starch is converted, but if syrup is sought then some part of the dextrine is left unaltered. The acid liquor is neutralized with chalk as before, and evaporated in vacuum pans, and after the separation of the gypsum is run into barrels and allowed to crystallize. For syrup a certain percentage of dextrine is left in the liquid unconverted, which helps to keep it from crystallizing, and in the manufacture of syrup special care must be observed to neutralize all of the acids. The sugar is sometimes cast into blocks six inches square and dried on plaster plates, in a current of dry air, as hot air would be apt to discolour it. It has been found that glucose can be made from cellulose as well as from starch, but the process is too expensive for practice; it is, however, interesting from a scientific point of view, and ought to be mentioned in this connection.

Two parts of clean linen shreds are gradually added to three parts of sulphuric acid, and they are allowed to stand twenty-four hours; the whole is then largely diluted, and the sulphuric acid neutralized by carbonate of lime or carbonate of baryta. In a similar manner any other kind of cellular tissue, as cotton, wood-shavings, paper, etc. can be converted into grape sugar.

It is a singular fact that, although we can prepare grape sugar from cane by the action of acids, no way is at present known by which glucose can be reconverted into sucrose. It would be a discovery of great importance if we could make cane sugar from glucose, as in that event common sugar could be prepared from a great variety of refuse matters, and would be largely reduced in price.

There was a time when much grape sugar was manufactured in England clandestinely, for the purpose of adulterating Muscovado sugar, but this illegitimate business was destroyed as soon as the tariff on sugar was reduced. The price of cane sugar must be very high before manufacturers can afford to make grape sugar for its adulteration.

The starch of potatoes can be converted into glucose by digesting for a few hours with parings of the potato. This operation is largely practised by German farmers in the preparation of food for fattening hogs. The starch is rendered more digestible in this way, and from the glucose some of the larger proprietors manufacture alcohol, for which they obtain a high price.

An excellent article of starch sugar can be prepared from Indian corn, which will yield alcohol one-eighth cheaper and quite as pure as that from cane sugar. As by a recent decision of our Courts the manufacturers of alcohol and vinegar from this source are not distillers within the meaning of the tax levy, the business is not hampered by licences, inspections, or stamp duties, and has thus a great advantage over ordinary distilleries.

In some parts of Europe large quantities of grape sugar are used to add to wine, but in this country it is not so much the wine growers as the brewers who make such an extensive use of it as to give rise to its regular importation. This can hardly be justified excepting in times when the price of barley is very high.

We find in the *Zymotechnic News* of St. Louis an interesting article on the uses of starch sugar in the manufacture of beer, from which we quote the following paragraphs:—

"Barley contains on an average 57 per cent. of starch and cognate substances. These pass into the wort, partly as sugar, partly in the shape of dextrine (gum). The relative proportions of these ingredients vary in accordance with the method of brewing, but experience teaches that, on an average, one bushel of barley yields about 12 lb. of sugar and 15 lb. of dextrine. A portion of the latter substance is further transformed into sugar during fermentation, so that a bushel of barley represents, on an average, 16 lb. of sugar and 11 lb. of dextrine (gum).

"Both dextrine (gum) and sugar are equally essential to the brewing process. The latter furnishes the alcohol, without which no beverage can be called spirituous; while the former constitutes almost the entire extractive matter, or body of the beer, which is one of the chief distinguishing features between beer and wine. Now it is true that all (commercial) starch sugar contains a certain amount of dextrine,—the more, the poorer the quality; but this portion would be insufficient in case a good article was used, while in the contrary case it would be paid for at an extravagant rate.

"Imported potato sugar of good quality, containing some 15 per cent. of dextrine (gum), costs about 12 cents per pound at New York. Maize sugar of equal purity can be furnished at 8 cents per pound. 20 lb. of either article, costing respectively \$2·40 and \$1·60, would yield 16 lb. of fermentable sugar and 3 lb. of dextrine (gum), while a bushel of barley will not only yield 16 lb. of sugar, but 11 lb. of dextrine or gum besides. Thus, starch sugar can be added to beer wort only in small quantities, unless when it is desired to impart a vinous character to the beer. When the latter object is not in view, the best substitute for barley will always be found in maize or some other cheap grain.

"Not so in the manufacture of wine. For this purpose, good starch sugar, containing not exceeding 15 per cent. of dextrine, is decidedly preferable to cane sugar. A pound of the latter, of the quality suitable for wine manufacture, costs at least 15 cents; whereas, as just stated, good starch sugar from maize can be sold at 8 cents. Now, as 5 lb. of starch sugar are equivalent to 4 lb. of cane sugar as regards their yield of alcohol, the balance is altogether in favour of maize sugar, to wit:—

4 lb. cane sugar at 15 cents . . . 60 cents.
5 lb. grape sugar at 8 cents . . . 40 cents.

"The 15 per cent. of dextrine (gum) contained in the maize sugar will (according to the usual proportion of sugar added to must) increase the amount of 'extract' in wine only by a few per cent., and will tend to give it the 'mouthly' taste (body) which in meagre wines, already fermented, is sought to be produced by the addition of glycerine.

"Enormous quantities of cane sugar are already being consumed in the wine manufacture in this country; so that even as a consideration of national economy it is highly important to supply in maize sugar a partial substitute for imported cane sugar."

In France there is a use for grape sugar arising from the fact that the sugar manufacturers do not prepare molasses ready for the market as they do in this country. The crude molasses is bought up by second parties and the grape sugar is used very largely by them to extend it and give it body. An alkaline solution of grape sugar is converted by heat into a dark brown body, called melassic acid. This acid has a powerful affinity for oxygen, and reduces the CuO to Cu_2O. Some of the tests for grape sugar are founded upon this reaction. One of them, known as Fehling's test, is prepared as follows:—A standard copper solution is made from 1 oz. crystallized sulphate of copper, 3 oz. cream of tartar, $1\frac{1}{2}$ oz. pure carbonate of potash, 14 or 16 oz. of a solution of caustic soda (sp. gr. 1·12), and water until the solution measures 15,160 water grains; 200 measured grains of this solution contain a quantity of copper that would be reduced by 1 grain of sugar, each atom of sugar reducing 10 atoms of the black oxide of copper to the state of suboxide. Cane sugar is converted into grape by boiling with weak sulphuric acid, and it can then be easily tested by the standard solution. It sometimes becomes necessary to test for sugar in diabetic urine; this is accomplished in various ways. One of them, called Trommers' test, is as follows:—Add caustic potash, and filter if necessary, then dilute solution of sulphate of copper in small quantities; the precipitate that first forms dissolves on stirring, and the solution becomes azure blue, but after standing, a fawn-coloured precipitate of suboxide of copper will be formed. The conditions and precautions to be observed are fully given in medical works and need not be repeated here. The property of grape sugar to reduce metallic salts is made use of for the preparation of silver mirrors. Add to the nitrate of silver a few drops of ammonia and then some grape sugar, and the metal will be precipitated.

Chloride of silver can also be reduced by grape sugar, and this method affords a way for reclaiming photographic wastes, and of preparing pure metallic silver. Take 14 parts of well-washed and still moist chloride of silver, 24 parts of caustic soda, sp. gr. 1·333, $11\frac{1}{4}$ parts ammonia, sp. gr. 0·925; to this add, with constant agitation in a flask, $7\frac{1}{2}$ parts pure honey, or $9\frac{1}{2}$ parts grape sugar syrup, and let the mixture stand in a warm place until sulphuretted hydrogen affords no sign of silver. Decant and wash out all traces of chlorine. The reduced silver can then be dried and melted in a crucible.

Platinum black, finely divided metallic platinum, can be obtained from the chloride by adding carbonate of soda in excess, and heating the solution for ten minutes. The precipitate can be collected in a filter, and then well washed and dried.

Grape sugar crystallizes in warty, cauliflower concretions, composed of hard transparent cubes. It is less soluble in water than cane sugar, but more soluble in alcohol. Two and a half parts of glucose are required to produce the same sweetening effect as one part of cane sugar. Sulphuric acid does not decompose it, but forms a definite acid with it, salled sulpho-saccharic acid. It forms a double salt with common salt.

$$NaCl,2(C_{12}H_{12},O_{12})+2aq.$$

It also forms definite but unstable combinations with the alkaline bases.

From the foregoing it will be apparent that grape sugar can be easily and cheaply prepared, and that it is capable of many important uses in the arts if it could be manufactured in adequate quantity and at a reasonable rate.—*Journ. of Applied Chemistry, New York, June*, 1870.

CINCHONA CULTIVATION IN INDIA.

A return has just been published of the East Indian Cinchona cultivation, including all the returns issued from April 1866 to 1870, and as was the case with the two preceding documents, it contains much useful and interesting matter. Beside the Annual Reports of the superintendents of the cinchona plantations, there are Reports of the Madras and Bombay Commissions, formed for the purpose of testing on a large scale the efficacy of the sulphates of cinchonidine, quinidine and cinchonine. The trials were conducted by a great number of civil and military practitioners, in stations notably malarious, and in cases which were types of all the forms of fever to be met with in the malarious districts of Southern India. In the first report of the Madras Commission, it is stated that up to March, 1867, 1145 cases of paroxysmal fever had been treated with these alkaloids. Of this number 410 were treated with cinchonine, 359 with cinchonidine and 376 with quinidine. Doses of 8 or 10 grains daily were found to produce the best results, larger doses producing cinchonism. Out of this number only 4 deaths occurred, and in these cases the fever was complicated with pneumonia and diarrhœa; the patients being half-starved, emaciated, and completely prostrated by the malarious influences which surrounded them. Of the remaining 1141 only 27 failed, *i. e.* about 2 per cent. In these the fevers were not recent, but the systems of the patients were chronically poisoned by malaria,—quinine failing equally in many cases. Judging from these facts, the Commissioners are of opinion that these alkaloids are scarcely inferior, if at all, to quinine. The general opinion that cinchonine is a greater irritant than quinine, was not found to hold good; the difference between the three alkaloids and quinine being looked upon by the Commission as of degree and not of kind.

From this period to April, 1868, 2472 cases were tried with the four alkaloids under precisely similar conditions, in order to make the comparative trial as perfect as possible. Of this number, 2445 were cured and 27 failed. With chemically pure sulphate of quinine, 846 cases were tried, of which 840 were cured and 6 failed; the time taken to effect a cure being from 1 to 7 days, while the doses varied from 2 to 20 grains. Sulphate of quinidine was administered in 664 cases, 660 cases were cured and 4 failed, the time taken in effecting the cure being from 1 to 8 days, with doses of from 2 to 30 grains daily. Sulphate of cinchonidine was tried in 403 cases, of which 399 were cured and 14 failed; the time occupied being from 1 to 4 days, with doses of 3 to 20 grains. Sulphate of chinchonine was used in 559 cases, 546 were cured and 13 failed; the time occupied being from 1 to 8 days, with doses of from 2 to 30 grains. The general dose was from 1 to 8 grains. This shows about 1 per cent. of failure; but the cases of failure were of patients completely saturated with fever. From this it will be seen that, with the exception of cinchonine, the other alkaloids in their therapeutical and physiological action resemble quinine in a remarkable degree. Indeed, Mr. Broughton says that for a period of thirty years much of the commercial sulphate of quinine, from the method employed in its manufacture, would inevitably contain the sulphates of quinidine and cinchonidine, and would occasionally even consist entirely of the latter salts. All the cases treated have been carefully tabulated on a uniform method, and it would appear from the results given that chemically pure and ordinary commercial sulphate of quinine and sulphate of quinidine are equal in value; sulphate of cinchonidine only slightly less efficacious, and sulphate of cinchonine, though considerably inferior to the others, is a valuable remedial agent in fever. Like quinine, they have a tonic effect, help digestion and increase the appetite.

The Bombay Cinchona Commission report that they consider all these alkaloids as febrifuges, anti-periodics and tonics, and their general effects to be similar to quinine, though perhaps in an inferior degree. They produce the same effects as quinine to the extent of $\frac{1}{2}$ or $\frac{2}{3}$; the value of the four alkaloids and the doses necessary to produce an equal result being as follows:—Quinine 3 to 20 grains; quinidine 5 to 20 grains; cinchonidine 7 to 20 grains; cinchonine 7 to 20 grains. There are many other interesting features in this valuable report, to which we shall allude in a future article.

MILK OF ROSES.

In making milk of roses, the chief object should be to produce a perfect emulsion, or one at least which, if it separates after long repose, may be restored to a homogeneous state by slight agitation. Although other perfumes may be, and are commonly added to it, the scent of roses should predominate and form its characteristic odour.

ENGLISH MILK OF ROSES.

1. Almonds (blanched) .... $1\frac{1}{2}$ ounce.
   Oil of almonds } ...... { of each.
   White Windsor Soap } ...... { 1 drachm.
   Rose water .... $\frac{3}{4}$ pint.

Make an emulsion; to the strained emulsion add a mixture of—

Essence or spirit of roses .... $\frac{1}{2}$ fl. drachm.
Alcohol.......................... $2\frac{1}{2}$ fl. ounces.

and, subsequently, of —

Rose-water .... q. s.

To make the whole measure one pint, more alcohol is often ordered and used; but much of it is apt to cause the separation of the ingredients. In many samples, and in the inferior ones generally, it is omitted altogether. Some makers add a few drops of oil of bergamot, with two or three drops each of oil of lavender and otto of roses, dissolved in the alcohol.

2. Oil of almonds } .... { of each.
White Windsor soap } .... { 1 ounce.
Salts of tartar .... ½ drachm.
Boiling water .... ¼ pint.

Triturate and subsequently agitate until perfectly united. When cold, further add,

Alcohol .... 2 fl. ounces.
Spirit of roses .... a few drops.
Rose-water .... q. s.

to make the whole measure a pint.

The above are used as cosmetic washes in a similar way to "Gowland's Lotion," also to remove scurf, freckles, and acne or other pimples, and cruptions in slight cases.

FRENCH MILK OF ROSES.

1. Tincture of benzoin.... (simple) ½ fl. ounce.
" " styrax .... ¼ fl. ounce.
Spirit of rose.......... 1 to 2 fl. drachms.
Alcohol .... 2½ fl. ounces.

Mix, and add gradually, with agitation,
Rose-water .... 16½ fl. ounces.

Augustin recommends the addition of a little carbonate of potash (say 1 dr. to the pint) when it is intended to be used as a lotion in acne.

2. Tincture of benzoin.. (simple) 1 fl. drachm.
" " balsam of Peru .. 20 drops.
Rose-water .... ½ pint.

The addition of an ounce of alcohol, in lieu of a like quantity of rose-water, improves it.

3. Almond paste .... 3 drachms.
Rose-water .... ½ pint.
Tincture of benzoin .... ½ fl. ounce.

and make an emulsion as before. Use, etc., same as the preceding.

GERMAN MILK OF ROSES.

Dilute solution of diacetate of lead...................... ½ fl. ounce.
Lavender-water.............. 2 fl. drachms.
Alcohol .... 2½ fl. ounces.
Rose-water.................. ¾ pint.

Mix, with agitation. The alcohol is often improperly omitted, or less is used. It is cooling and astringent, and is employed as a wash, like the preceding; also in most eruptions, excoriations, etc., but it is more active and less fitted for very frequent use.—*New York Druggists' Circular.*

TESTIMONIAL TO EMPLOYERS.

On Wednesday, the 19th inst., one of those pleasing events so indicative of good feeling between the employers and employed took place at 16, Coleman Street, City. Messrs. Thomas and Frederick Burbidge, of the firm of Burgoyne, Burbidge and Co., were each presented with a handsome silver goblet and salver and an illuminated memorial. In addition to the crests the goblets bore the following inscriptions:—"Presented to Thomas [or Frederick] Burbidge, Esq., by the *employés* of Messrs. Burgoyne, Burbidge and Co., as a mark of their esteem and good wishes, 19th October, 1870." The goblets and salvers were executed by the well-known silversmiths, Messrs. Johnson, Walker and Tolhunt, of Aldersgate Street. The whole of the arrangements were carried out by a committee appointed by the *employés*, consisting of Messrs. Bartliffe, Chamberlain, Close, Frith, Webb, Weeks, Udger and Yanley. One of the rooms in the large warehouse was cleared, and the proceedings, which were of the most enthusiastic description, commenced at two o'clock. Mr. Yanley was called to the chair, and delivered the following address:—

"Messrs. Thomas and Frederick Burbidge,

"Gentlemen,—As the Chairman, and therefore the representative of my fellow-workers in your establishment, it is my great privilege and pleasure to occupy the position I hold to-day. Gentlemen, the object of our asking you to meet us is to testify to you that the many kindnesses we have received under various circumstances at your hands, and the good wishes each and all of us bear to you for your future prosperity, call for something more enduring than mere words or acts of duty. It is to the credit of Mr. Charlos Chamberlain that the idea was started of presenting a testimonial to you.

"Gentlemen, that idea has culminated in the present proceedings. Out of the number of your *employés* you will find that eighty-eight have contributed their portion to these testimonials, and—with one or two exceptions, from illness or business arrangements—they are now present. For many reasons it was not considered expedient by the committee appointed to take the management of these proceedings, to solicit from the juniors or from those recently engaged in your establishment any contributions whatever, and we trust this arrangement will be approved of by you.

"Gentlemen, we are deeply grateful for the interest you take in us, individually and collectively. Our benevolent and excursion funds receive at your hands a large amount of support; and in any amusements we have hitherto adopted, we have always found you to take the deepest interest, not only assisting us by your purse, but by your presence and counsel.

"It is now my pleasing duty to ask you to accept these small tributes of our regard,—presenting you, Mr. Thomas Burbidge, with a silver goblet and salver and an illuminated memorial, and you, Mr. Frederick Burbidge, with a silver goblet and salver and an illuminated memorial.

"We thank you for your courtesy in meeting us to-day, and assuring you of our united efforts to place your business in a still higher position than that it has already attained, we wish you long life and health to enjoy the fruits of your enterprise."

EAST INDIAN CINCHONA BARK.

One of the most interesting features at a recent drug auction in London (13th inst.) was the sale of cinchona bark, grown in the Royal Botanic Gardens, Darjeeling, East India.

On one occasion previously this bark has found its way into commerce but in small quantity. This parcel consisted of nineteen cases, each about eighty pounds in weight, and was described as red bark (*Cinchona succirubra*).

At a glance it was apparent that the greatest care had been bestowed upon its collection and preparation, and that it had been obtained from young trees whose ages did not vary considerably. It consisted entirely of quills, exceedingly uniform in their length (about fifteen inches), varying in thickness from the size of cinnamon bark to that of one's thumb; externally somewhat smooth, without lichens, of a greyish colour, with a pale reddish interior, resembling, to an unpractised eye, grey bark.

An average sample selected from five cases gave upon analysis in 100 parts—

Total alkaloids (hydrated)	3·36
Quiná (by ether)	2·40
Cinchonidine and Cinchonine......	·95
Crystallized Sulphate of Quinine ..	1·81

The Pharmaceutical Journal.

SATURDAY, OCTOBER 22, 1870.

PHARMACY IN IRELAND.

It is generally supposed that there will be an attempt to assimilate the law of Pharmacy in Ireland to the recent enactments in England and Scotland. It is probable that Sir Dominic Corrigan, M.D., the new member for Dublin, will take an active part in this contemplated Bill. Although the object will be to create a body of qualified pharmacists, as in the English Bill, still, in this case it will in some degree be a process of levelling down, not of levelling up.

The draft will probably be the Bill of the Apothecaries' Hall, modified to meet some objections, and separated from the "Poisons Bill," which, as our readers are no doubt aware, has already become law.*

The draft of the Pharmacy Bill in its original form was, as we stated at the time, fair, and would, with some few alterations in committee, have met the requirements of the time.

We shall look forward with some interest to the future prospects of pharmacy in the Sister Isle. From the fact that every compounder in Ireland has become a licensed medical practitioner, pharmacy, as an art, may be said to be almost extinct in that country.

THE POSTAL REGULATIONS.

We have received several complaints that the Journal is now sent out uncut and unstitched. This has been done in order to comply with the regulations laid down by the Post-Office authorities in reference to the transmission of periodical publications for one halfpenny postage. The fact that some readers of the Journal object to the new arrangement will be submitted to the consideration of the Council at its next meeting.

THE SALE OF LAUDANUM.

It would appear from the police cases reported this week as well as last week that some of our magistrates are not acquainted with the Sale of Poisons Act. Under its provisions it is competent for registered druggists to sell any quantity of laudanum under certain conditions. Moreover, we believe druggists are generally careful in the exercise of their discretion as to the sale of poisons. Therefore the remarks of the magistrates in both these cases, implying censure of the druggists who sold the laudanum, were uncalled for so far as the facts are made known.

* "Poison Bill for Ireland," *vide* Pharmaceutical Journal, Vol. XI. p. 746.

It will be seen from the report, at p. 334, that a correction has to be made in the statement that the message received from the American Pharmaceutical Association was an answer to the message sent by the Conference meeting at Liverpool.* Both messages were sent spontaneously and almost at the same moment.

We understand that Mr. Wanklyn is a candidate for the chair of Chemistry connected with the medical school of Bartholomew's Hospital. Considering this gentleman's reputation at home and abroad, as well as the importance of this chair, and the fact that so few of our chemists, who hold high position, are active cultivators of their science, we venture to think that Mr. Wanklyn's appointment would be a step well calculated to make good the great loss this school has suffered in the death of Dr. Matthiessen, and for that reason we wish him all success.

An interesting letter from Mr. Ernest Hart has appeared in the *British Medical Journal*, containing an account of his recent visit to the seat of war in company with Mr. Berkeley Hill. These gentlemen took with them private stores furnished by Mr. Hills (Bell and Co.), Messrs. Savory and Moore, Mr. Blaise (Savigny and Co.), Mr. Edwin Arnold and Mr. Von Glehn. Mr. Hart was authorized to expend a certain amount of money on account of the French Committee, and Colonel Lindsay, on behalf of the British Society, placed at his disposal a store of assorted surgical instruments, together with a letter authorizing the Society's agents, in case of necessity, to furnish what stores they could spare from their depots. They arrived immediately after the battle of Sedan, and Mr. Hart speaks highly of the arrangements made for the reception of the wounded by the Belgian authorities.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

October 14*th*, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden and Ince.

MODIFIED EXAMINATION.

Forty-five Candidates presented themselves for Examination; the following thirty passed, and were duly registered as

CHEMISTS AND DRUGGISTS.

Allsop, George William ...... Birmingham.
Booth, Edwin .... Southport.
Clark, John .... Sheffield.
Evans, Gomer .... London.
Farrer, Robert S. .... Brighton.
Fewster, William Longwood. . Liverpool.
Forster, William Day .... Godalming.

* See No. 15, p. 297.

	Fudgé, Charles William	Shepton Mallet.
	Gregory, John	Stockton-on-Tees.
	Ham, William	London.
	Harland, Richard Thomas	Geneva.
	Hughes, William, junior	Presteigne.
	Jones, Ellis	Bala.
	Keast, Samuel John	Camborne.
	Lidgett, Walter Fletcher	Leicester.
	Light, John Henry	Bristol.
	Manfull, Horatio John	Nottingham.
	Mason, Frederick	Rotherham.
	Oakey, Joseph	Liverpool.
	Passingham, George William	London.
	Philpots, George Payne	Leyton Green.
	Rowley, Seth Breaks	London.
	Shirtliff, Francis	Blackheath.
	Sproat, Robert	Hull.
	Stevens, Edmund Matthew	London.
	Tabor, Samuel	Reading.
	Thomas, Horace Alfred	Norwich.
	Walton, Henry	Manchester.
	Wightman, James Temple	Whitehaven.
	Wilson, Joseph Gilpin	Dublin.

FIRST, OR PRELIMINARY EXAMINATION.

Two hundred and twenty-four Candidates were examined; the following one hundred and sixty-four passed, and were registered as

APPRENTICES OR STUDENTS.

	Macaulay, Joseph John	Manchester.
	Martin, William Thomas	Lewes.
	Maitland, Leslie	Aberdeen.
Equal.	Bell, Charles John	Wellingborough.
	Pendrigh, John Cuthbertson	Sanquhar.
	Savory, Harry Banting	Painswick.
Equal.	Davies, Arthur	Swansea.
	Jupp, John	East Grinstead.
	Evans, John Watkin	London.
Equal.	Ford, Francis	Pendleton.
	Jackson, Henry Lawson	Crediton.
Equal.	Clayton, George	Aberdeen.
	Giles, William	Aberdeen.
	Blake, Charles Alexander	London.
	Cassie, Ralph Jas. Forbes Leith	Aberdeen.
Equal.	Barron, Alexander	Aberdeen.
	Spencer, James	Manchester.
	Cooper, Frederick Richard	Manchester.
Equal.	Cleaver, Edward Laurance	London.
	Fryer, Charles Hart	Norwich.
Equal.	Gostling, William Ayton	Diss.
	Samson, Ernest	Bristol.
	Miller, Nathaniel	Preston.
	Willcock, George	Bedford, near Manchester.
Equal.	Hall, Henry Stacey	Doncaster.
	Morrison, William Hay	Aberdeen.
Equal.	Hosie, John	Aberdeen.
	Hall, Henry Thomas	Stafford.
Equal.	Allan, Alexander Stuart	Aberdeen.
	Glover, William	Newcastle, Staffs.
	Heppell, James	Forest Hill.
	Russell, Matthew Rawlings	Whitehaven.
Equal.	Bradley, William	Dudley.
	Ellis, Henry	Rochdale.
	Highmoor, George Samuel	Leeds.
	Ragg, William Watkins	Edmonton Green.
Equal.	Foggon, George	Newcastle-on-Tyne.
	Norman, William Haswell	Wellingborough,
Equal.	Gilkes, Frederick George	Banbury.
	Handford, Joseph John	Gt. Torrington.
	Sturton, Richard	Cambridge.
Equal.	Bradshaw, John	Runcorn.
	Paulden, Henry	Liverpool.
	Sumner, Robert Mason	Liverpool.
Equal.	Butler, George Henry	Christchurch.
	Cruickshank, Joseph	Aberdeen.
	Cruickshank, William	Aberdeen.
Equal.	Fairman, George Peters	London.
	Norweb, Arthur	Nottingham.
	Stoddart, Joseph	Alresford.
	Marsh, William	Manchester.
Equal.	Braddock, James	Manchester.
	Wren, Henry	Bermondsey.
Equal.	Kirkby, Robert	Ulverstone.
	Simpson, James	Foveran.
Equal.	Bartle, William Frederick	Tyldesley.
	Davies, David C.	New Quay.
	Inglis, William	Ashton-under-Lyne.
	Oakes, Henry	Pickering.
	Emerson, Isaac Brown	West Hartlepool.
Equal.	Atkinson, Miles	Manchester.
	Southerst, Marshall	Haslingden.
Equal.	Beck, Alfred Wallis	Norwich.
	Gordelier, William Gibbs	Sittingbourne.
	Willan, Robert	Ulverstone.
	Newhill, John William	Huddersfield.
Equal.	Stevens, Richard	Leeds.
	Taylor, Herbert Edwin	Hadleigh.
	Cullen, Harry	Tewkesbury.
	Cheyne, Andrew	Liverpool.
Equal.	Harrison, James	Horncastle.
	Mills, John P.	Taunton.
	Wilson, Richard Edward	Newport, Mon.
Equal.	Carr, George	Sheffield.
	Chambers, Pearson	Cockermouth.
	Forth, William Pilcher	Ashford.
	Fowler, Thomas	Torrington.
	Holmes, William James	Bacup.
	Hope, William Hodgskin	Wellingborough.
	Fraser, Andrew	Aberdeen.
Equal.	Pattinson, Dan	Whitehaven.
	Warrack, Arthur Forbes	Aberdeen.
Equal.	Bull, Edward Samuel	Liverpool.
	Harsant, Frank Worsley	Epsom.
	Herbert, Samuel	Bristol.
Equal.	Brown, Frederick	Lincoln.
	Carruthers, Robert Buck	Withington.
	Cruickshank, George	Aberdeen.
	Gordon, John	Aberdeen.
Equal.	Bates, William Richard	Liverpool.
	Price, Benjamin Meredith	Hereford.
	Fegan, John	London.
Equal.	Abbott, Thomas Eastoe	Darlington.
	Bradley, John	Leeds.
	Broomhead, George Emmet	Aberdeen.
	Dingle, William Alfred	Ashton-under-Lyne.
	Edey, George	Rochester.
	Minett, Thomas Samuel	East Grinstead.
	Thompson, Fred	Sheffield.
	Walker, George	Doncaster.
	Watson, Joseph Henry	Halifax.
	Woolley, Harold	Manchester.
	Walton, Major Foulds	Sowerby Bridge.
Equal.	Crofts, Henry Baptist	Cranbrook.
	Cowe, Samuel M'Cutchan	Whitehaven.
Equal.	Hogg, Edward Grindle	Ealing.
	Marsh, William Henry	Norwich.
Equal.	Coumbe, John Butten	Plymouth.
	Lewis, Joseph	Milborne Port.
	Newton, John Titus	Sedgley.
	Case, Perkins William	Trowbridge.
	Twist, Edward Herbert	Prescot.
	Sharp, William George Graham	Birmingham.
Equal.	Eckersley, Moses	Wigan.
	Evans, David	Newcastle Emlyn.
Equal.	Dunlop, Thomas Hall	Newcastle-on-Tyne.
	Weeding, William Samuel	Hastings.
Equal.	Bannard, Henry	London.
	Davey, Thomas Seccombe	Exeter.
	Gooding, Henry	Woburn.
	Hope, John Hart	Wellingborough.
	Kirton, Richard Gervase	Boston.
	Storey, John Charles	Hull.
	Wilmer, Frederick Joseph	Newport Pagnel.

Equal. { Forsbrook, William Henry .. Birmingham.
Grove, Harry Nicholas ...... Walsall.
Roberts, David Prosser ...... Hereford.
Hambridge, Thomas .... Tottenham.
Equal. { Bake, Alfred Benjamin ...... Guildford.
Christie, James .... Aberdeen.
Avison, David .... Wakefield.
Equal. { Bristow, Charles Robert ...... Ryde, Isle of Wight.
Lund, Richard John .... Leeds.
Severs, Samuel Thomas ...... Leeds.
Wheeler, William Henry .... Bristol.
Woolldridge, George .... Birmingham.
Haworth, Edwin .... Oswaldtwistle.
Gould, Henry Thomas ...... Newport, I. W.
Broadbent, Sidney .... Saddleworth.
Equal. { Boulton, Henry Hamer ...... London.
Bunn, Charles Grinling ...... Colchester.
Hetherington, Martin Luther . Highbury.
Heward, George .... Havant.
Hodgson, Alfred .... York.
Jameson, William Edward .... Bristol.
Mills, Robert .... London.
Urwin, James Alexander .... Harton.
Pott, Frederick Fore .... London.
Equal. { Clarke, Thomas Edward ...... Shrewsbury.
Hargreaves, Joseph .... Liverpool.
Equal. { Holgate, Sam .... York.
Harry, Seth .... Gravesend.
Equal. { Kirkwood, Daniel .... Beith.
Bumpstead, Robert George.... Colchester.
Fox, William .... Grantham.
Harrison, William Hopper.... Barnstaple.
Husband, John Cecil .... Berwick-on-Tweed.
Jeffery, Henry Thomas ...... Tring.
Macdonald, George Edward .. Ashton-under-Lyne.
Smith, Arthur John.......... London.
Stephan, William Henry .... Chipping Norton.
Stubbs, Edwin .... Hull.
Thompson, Lawrence Joseph.. Thirsk.
Walbran, Francis Maxwell.... Leeds.

The Certificates of Examination of the following by other bodies were accepted in lieu of the Society's Preliminary Examination:—

Birch, Charles .... Chesterfield.
Cogman, Charles .... London.
Lansdale, John Anstey ...... High Wycombe.
Overton, Charles Arthur...... Horncastle.
Utting, Charles Edward ...... Diss.
Walton, Thomas .... Bishopwearmouth.
Webb, Herbert Charles ...... London.

The Questions for Examination were as follows.

Time allowed: Three Hours.

LATIN.

Translate into English two or more of the following sentences:—

1. Ita dies circiter quindecim iter fecerunt, uti, inter novissimum hostium agmen et nostrum primum, non amplius quinis aut senis millibus passuum interesset.

2. Quos quum apud se in castris Ariovistus conspexisset, exercitu suo præsente, conclamavit: Quid ad se venirent? an speculandi causâ? Conantes dicere prohibuit, et in catenas conjecit.

3. Liquorem ammoniæ spiritu misce: tum ex retortâ vitreâ, lento igne, destillet octarius; denique in hoc liqua camphoram.

4. Optimè terantur simul, dein in pulveres octo æquales dividentur, quorum capiat æger unum omni horæ quadrante, donec adsit catharsis.

5. Decline *cyathus vinarius*.

6. State the superlatives of *bonus*, *multus* and *nequam*.

7. Give the accusative endings of the five declensions.

8. Give the third persons singular and plural, indicative mood, present tense of *capio*, *sumo*, *adhibeo* and *cogito*.

9. How does the relative agree with the antecedent? Give an example in Latin.

ARITHMETIC.

10. A cow and a calf were worth £16. 7*s.* $10\frac{1}{2}$*d.*: the calf alone was worth £2. 6*s.* $7\frac{3}{4}$*d.*, what was the value of the cow?

11. A wall 28 feet in height was built in 15 days by 68 men; how many men working at the same rate could build a wall 32 feet high in 8 days?

12. Reduce $\frac{378}{1233}$ to its lowest terms.

13. Multiply $3\frac{5}{8}$ by $4\frac{5}{6}$.

14. Divide 267·15975 by 1·25.

ENGLISH.

15. Name the relative pronouns; why are they so called?

16. Give the masculine nouns corresponding to duchess, heifer, witch and roe, and the feminine to beau, lord, master and executor.

17. How are the comparative and superlative degrees formed? Give examples, and state what change takes place in dissyllables in *y*.

18. What is meant by a *neuter* verb? and write down a sentence containing one.

19. Parse the following:—The Imperial troops took possession of the bridge.

20. Write from 15 to 25 lines upon *one* only of the following subjects:—

a. War and the consequences thereof.
b. Steam, its advantages and disadvantages.
c. The holiday trip.

EXAMINATION IN EDINBURGH.

October 11th, 1870.

Present—Messrs. Aitken, Baildon, Brown, Buchanan, Kemp, and Young.

Twenty-two Candidates were examined—two Major, six Minor, nine Modified, and five Preliminary; the following passed:—

MAJOR (registered as Pharmaceutical Chemists).

Paton, James................ Edinburgh.
Robinson, James .... Darlington.

MINOR (registered as Chemists and Druggists).

*Oscroft, James .... Salford.
Brewis, Thomas .... Rothbury.
Elder, William Nind .... Pulteney Town.
Strachan, Alexander .... Aberdeen.

MODIFIED (registered as Chemists and Druggists).

Cant, David .... Forfar.
Clarke, Joseph Adam .... Glasgow.
Clarkson, Thomas .... Hartlepool.
Coates, Joseph .... Newcastle.
Purdie, James .... Glasgow.
Sibthorp, Stephen James Kenneth .... Glasgow.
Tocher, George.............. Portobello.

PRELIMINARY (registered as Apprentices or Students).

Attwood, Henry Ernest ...... Edinburgh.
Forewell, Henry...... ...... Edinburgh.
Linklater, James .... Edinburgh.
M'Glashan, Alexander ...... Perth.

ERRATUM.—Page 309, col. 2, lines 13 and 14,
for Martin, John .... Seacombe.
Miller, William Henry .... Ridgeway.
read
Martin, John .... Ridgeway.
Miller, William Henry .... Seacombe.

* Passed with honours.

PHARMACEUTICAL EDU

TABULATED RETURNS FROM PROV

(THE NUMBERS OF STUDENTS RE

	NAME OF SOCIETY AND YEAR OF ESTABLISHMENT.	PREPARATION FOR THE PRELIMINARY EXAMINATION.					CHEMISTRY (INORGANIC AND ORG			
		Teacher.	Fee.	Lesson Hour.	No. of Students entered.	No. of Lessons.	Teacher.	Fee.	Lecture Hour.	No. of Students
ABERDEEN	Society of Chemists and Druggists (1839).	Mr. Roy	5s. per qr.	9 P.M.	34	4 weekly	Dr. Beveridge (a)	......	......	....
ASHTON-UNDER-LYNE.	Ashton-under-Lyne and Dukinfield Chemists' Association (1869)	....	......	......	....	......	(b)	......	......	....
BATH	Chemists' Assoc. (1864).	....	......	......	....	......	....	......	......	....
BIRMINGHAM ..	Midland Counties Chemists' Assoc. (1869) ..	....	......	......	....	......	(c)	......	......	....
	Chemists' Assistants' Association (1868)	....	......	......	....	......	....	......	......	....
BRADFORD	Chemists' Association	Mr. J. Trotter .. (Latin only.)	......	8.30 P.M.	....	......	Geo. Ward, F.C.S.	(d)	8.30	3 In. O
BRISTOL	Pharmaceutical Association (re-estab. 1869)	....	......	......	....	......	Thos. Coomber..	(e)	8. P.M.	26
COLCHESTER ..	Association of Chemists and Druggists (1845)	....	......	......	....	......	....	......	......	....
DUNDEE	Chemists and Druggists' Association.	....	......	......	....	......	....	......	......	....
EDINBURGH ..	....	W. Skae, M.A...	31s. 6d.	Various	....	3 mo. daily.	....	42s.	10 A.M.	2
EXETER	Exeter Pharmaceutical Society (1845)	....	......	......	....	......	(f)	......	......	....
GLASGOW	Chemists and Druggists' Mutual Improvement Association (1854)	....	......	......	....	......	(g)	......	......	....
GOSPORT......	....	....	......	......	....	......	....	......	......	....
HALIFAX	Halifax and District Chemists and Druggists' Association (1868)	Mr. Gibb (h) .. (Latin only.)	5s. per Sess.	8–9 P.M.	10	50	Mr. Jarmain (h)	5s. per Sess.	El. 8–9 Adv. 8.30–9.30	
HULL	Chemists' Assoc. (1868).	....	......	......	....	......	W. A. Rudd, (i) M.R.C.S. Includes Prac. Ch., Mat. M	21s.	8-10 P.M.	2
LEEDS	Chemists' Association (1862)	Mr. Megilley ..	A 42s. B 21s.	8–10 6–8	5 3	26 13	G. Ward, F.C.S. Mr. Jefferson, F.C.S. }	Inorg. { 21s. 5s.	8.15–10 8–10	1
							Mr. G. Ward Org.	10s. 6d.	8.30–9.45	
LEICESTER	Chemists' Assistants and Apprentices' Association (1869) (j)	Mr. W. B. Clark	......	8.30–10.30	....	6	Mr. Josh. Young	......	8.30–10.30	1
		Mr. Cooper (Latin)		ditto		5	Includes Prac. Chemistry.			
LIVERPOOL....	Chemists' Assoc. (1868).	....	......	......	....	......	Edward Davies, F.C.S.	free	7–8 P.M.	1
MANCHESTER ..	Chemists and Druggists' Association	Pr. Wilkins, M.A. A. Symonds, B.A. (Latin only.)	15s.	7.30 P.M.	20	27	Professor Roscoe, F.R.S. C. Schorlemmer	15s.	8.30 P.M.	3
NEWCASTLE-ON-TYNE	University of Durham..	....	......	......	....	......	A. Freire-Marreco, M.A.	(k)	4 P.M.	1
NOTTINGHAM ..	Nottingham and Notts Chemists' Association.	Mr. Cokayne .. (Latin only.)	10s.	9–10 P.M.	27	26	Mr. Taylor	5s.	8–9 P.M.	1
PLYMOUTH (l)	Association of Chemists for Plymouth, Devonport and Stonehouse	....	......	......	....	......	Mr. Ryder......	10s.	......	....
SCARBOROUGH..	Chemists' Assoc. (1870).	....	......	......	....	......	....	......	......	....
SHEFFIELD	Pharmaceutical and Chemical Association	....	......	......	....	......	Mr. Geo. Harrison, F.C.S.	10s. 6d.	9–10	3
SUNDERLAND ..	Chemists' Association ..	....	......	......	....	......	....	......	......	....
TAUNTON	Chemists' Assoc. (1870).	....	......	......	....	......	....	......	......	....
YORK	Chemists' Association ..	....	......	......	....	......	....	......	......	....

(a) These classes are in connection with the Mechanics' Institution.

(b) Students attend the classes in Manchester, the distance being six miles.

(c) The Midland Institute supplies lectures in Latin, Chemistry and Materia Medica, which are well attended by chemists' assistants. See note on page 332.

(d) Fee for Chemistry and Botany, inclusive, 5s.

(e) Fee for Chemistry and Botany, inclusive, 5s. See no[te] on page 332.

(f) There are Chemistry and Botany classes at the Govern[]ment Science School.

(g) Anderson's University and the Mechanics' Institu[]

N IN THE PROVINCES.

ASSOCIATIONS.—SESSION 1869-1870.

O THOSE ENGAGED IN PHARMACY.)

Chemistry (Practical). Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	Materia Medica and Pharmacy. Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	Botany. Teacher.	Fee.	Lecture Hour.	No. of Students entered.	No. of Lectures.	Total Number of Lectures. (Prel. Ex. excluded.)
......	......	......	......	..	Dr. Beveridge (a) Including (b)	21s. Botany.	7–9 P.M.	8	3 weekly	Included in Mat. Med. and Pharmacy. (b)				..	......
......	......	......	......	..		......	......	......	......		......	......	......	..	......
r. Gatehouse	10s.	8 P.M.	6	13	......	......	......	......	......	......	......	......	......	..	13
......	......	......	......	..	......	......	......	......	......	(c)	......	......	......	..	......
......	......	......	......	..	W.J.Churchill Does not include Pharmacy.	nom.	8	18	14	......	......	......	......	..	14
......	......	......	......	..	......	......	......	......	......	L.C.Miall, F.L.S.	(d)	8.30	33	14	26
......	......	......	......	..	......	......	......	......	......	A. Leipner	(e)	8 P.M.	20	52	108
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	......
r. W. Laird	free	......	......	..	......	......	......	......	......	......	......	......	......	..	......
......	42s.	11 A.M.	....	50	......	42s.	9 A.M.	14	100	......	42s.	8 A.M.	13	50	300
......	......	......	......	..	......	......	......	......	......	(f)	......	......	......	..	......
C. Moffat, M.D., F.R.S.E.	21s.	9.30 P.M.	13	25	......	......	......	......	......	(g)	......	......	......	..	......
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	......
......	......	......	......	..	......	......	......	......	......	Mr. Walker	5s. per Sess.	8.30–10	13	25	85
......	(i)	......	......	..	(i)	......	......	......	......	J. C. Niven	6s.	6.30–7.30 A.M.	24	16	42
r. Geo. Ward, F.C.S.	21s.	7.30–10	7	31	......	......	......	......	......	......	......	......	......	..	84
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	
......	......	......	......	..	Mr. Torbitt ..	......	8.30–10.30	7	6	Mr. W. E. Hill .	......	8.30–10.30	6	3	21
Edward Davies	63s.	7–9 P.M.	5	26	Dr. Carter.... Includes Botany.	42s.	7–9 P.M.	2	26	Included in Mat. Med. and Pharmacy.					67
......	......	......	......	..	Mr. Somers .. Does not include Pharmacy.	15s.	8.35	20	27	Prof. Williamson, F.R.S.	15s.	7.30	21	27	81
A. Freire-Marreco, M.A.	(k)	9.30 A.M.	16	50	T. Humble, M.D. Materia Medica. B. S. Proctor Pharmacy.	(k)	4.0 7.30	16	75 25	J. Thornhill .... W. Arnison, M.D.	(k)	3 P.M.	16	50	300
......	......	......	......	..	Mr. Hughes ..	free	9–10	30	20	Dr. Burnie	free	9–10	30	16	62
......	......	......	......	..	......	......	......	......	......	F. P. Balkwill .. Sys. Ec. and Struc.	Sys. 5s. .. 5s.	10–12 7–8.30	13 13	30 30	......
Mr. Ward ..	free	9–10	30	12	Mr. Gowland, F.C.S.	10s. 6d.	9–10	15	12	Mr. Birks	10s. 6d.	9–10	22	10	46
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	......
......	......	......	......	..	......	......	......	......	......	......	......	......	......	..	......

hitherto supplied students with lectures in Latin, Chemistry and Botany, but the business hours of a large portion of the trade are such as to prevent many from taking advantage of them.

) In connection with Haley Hill College.

) The course includes Chemistry (Inorganic, Organic and Practical), Materia Medica and Pharmacy, and the fee is 21s.

(j) The classes are free to all members of the Association.

(k) The fee of £6. 6s. entitles to admission to all the classes. See additional note.

(l) The classes are in connection with the Plymouth and Devonport Science School.

PHARMACEUTICAL EDUCATION IN THE PROVINCES.

The following is an epitome of the additional information furnished by the various societies:—

Aberdeen.—The Latin class is spoken of favourably by the teacher. In the Chemistry (Organic and Inorganic) class two students have received second-class government certificates, and a large number intend applying for the Preliminary Examination in October next. The Library is a very select and valuable one, numbering 300 volumes, and is well used. It is open once a week from 8 to 9 P.M., and for reference during the meeting of the classes. Books may be obtained at other times by giving an hour's notice. There is but a mere commencement of a museum. This Society was established in 1839, before the Pharmaceutical Society; and Mr. John Mackay, in his evidence before the House of Commons, referred to the benefits which had followed its institution. The members formerly paid an entrance fee of £2. 2*s.* and an annual subscription of 10*s.* 6*d.*, but this year the entrance fee has been abolished. The assistants are allowed the use of the class-room; they meet fortnightly in the winter months, and monthly during the remainder of the year, when papers are read and subjects discussed in connection with the business. The greatest wants are a museum and a Practical Chemistry class.

Ashton-under-Lyne and Dukinfield.—There are no classes immediately connected with this Association. Some students attend the Manchester classes, others are preparing for the Preliminary Examination by private tuition. No library or museum. Several lectures on chemistry and kindred subjects were delivered during last session, which were well attended.

Bath.—A small library, from which books may be obtained at any time; it is not much used. No museum.

Birmingham.—(1.) The Midland Counties Chemists' Association was established last year mainly for the protection of trade interests. Arrangements have been made with Dr. Alfred Hill for the delivery of a course of twelve lectures, commencing the 5th of October, on Pharmaceutical Chemistry, in his laboratory at the Queen's College. (2.) The Chemists Assistants' Association report that those attending the lectures on Materia Medica in connection with it have found them of great assistance in preparing for their examinations. There is no library at present, but the formation of one is contemplated. A small museum. There are also classes and lectures in connection with the Midland Institute, comprising Chemistry, Botany and Latin, which are well attended by chemists' assistants in Birmingham.

Bradford.—The payment of 5*s.* annually by Apprentices and Associates as members of the Society entitles them to free admission to the classes. Two Associates have passed the Modified and one the Major Examination. No library or museum.

Bristol.—The classes are the science classes in connection with the Educational Department of the Government. The Council have arranged with the two professors, that by the payment of a lump sum they should be entitled to send to their lectures any number of pharmaceutical students. Of the 26 who entered for Inorganic Chemistry, 12 underwent the Government examination, of whom 11 passed and 1 failed. In Organic Chemistry, out of 9, 8 were examined, 7 passed and 1 failed. In Botany, 8 were examined, 2 passed. The details of these examinations will be found reported, PHARM. JOURN. No. 9, p. 173. No library or museum.

Colchester.—No educational organization. The library, numbering about 300 volumes, is open daily, and contains the books required in preparing for the Society's examinations. The number of books issued last year was 164. No museum.

Edinburgh.—The North British Branch of the Pharmaceutical Society at Edinburgh has a library in which there are upwards of 250 volumes. These are available to all members, associates and apprentices of the Society. There is also a museum, containing more than 400 specimens, which is open to all students in pharmacy on application to the Secretary. The books are not much used, although there are constantly several volumes in circulation. The museum is in request generally by those who are preparing for their examination. Some years ago an effort was made to open special classes in the evening for young men. At first this was successful, but the attendance became gradually so thin that they were given up. Since then no separate classes have been opened, but the University and other lectures have been attended by Pharmaceutical students. Last session admission was given to regular courses on materia medica, chemistry and botany, at the reduced fee of £2. 2*s.*, to all who were engaged in the study of pharmacy. It is hoped that similar arrangements may be made for next session. It should be borne in mind that in a place like Edinburgh, young men have a choice of teachers, and as no special lecturers are named by the Society, they may and do attend any class they please. In regard to education for the Preliminary examination, there are opportunities given for instruction in Latin. One gentleman advertises a class, at a suitable hour, for persons preparing for the Preliminary examination; and also for those who, wishing to pass the Minor, may require to study a short time to enable them to pass the classical: fee 31*s.* 6*d.* per quarter.

N.B.—By the kind permission of Professor Archer, students in pharmacy have the privilege of inspecting the valuable collection of materia medica and other specimens in the Edinburgh Museum of Science and Art.

Exeter.—No educational organization in connection with the Society, but there are classes for Chemistry and Botany at the School of Science. About 120 books belonging to the Society have hitherto been kept in the counting-house of one of the members; efforts are being made to provide a more convenient place for reference and study. No museum.

Glasgow.—Anderson's University and the Mechanics' Institute have hitherto supplied students with education in Latin, Chemistry and Botany, but the business hours of a large portion of the trade are such as to prevent many from taking advantage of them. There are no classes for Materia Medica or Pharmacy, except at the Universities, where the hours and fees are both unsuitable. No library or museum.

Gosport.—Only a trade society for the regulation of prices.

Halifax.—The classes in Chemistry and Latin are in connection with Haley Hill College. The class in Botany is founded by the Association, and any deficiency is supplied from its funds. Two great obstacles exist, preventing that thorough application of the young men to their studies which is now so much needed. One obstacle is the apathy of a great proportion of them, and the other is the late business hours of the trade. Great efforts are at present being made to remove both these barriers. Special prizes will be offered for competition at the end of the present session, which it is hoped will rouse the spirit of the students, and a movement is on foot "which has fair prospects of success" for an earlier uniform closing hour. No library or museum.

Hull.—The fees received from the classes do not pay much more than half the expenses, the deficiency being made up by subscriptions. The past session is looked on as a success by the Committee, but it is doubtful whether the institution can be kept up without further aid. The lectures on Botany are given in the Hull Botanical Gardens, where there is a splendid collection of plants and an able curator. The average attendance at the Chemistry class is 14; at the Botany class, 15. The progress of the students is spoken of by the teachers as satisfactory. No library, but a few books are promised. No museum.

Leeds.—Chemistry classes are conducted at two Institutions in the town (the Mechanics' Institute and the Young Men's Christian Association), and Associates of the Society are allowed to attend either course on the same terms as the members of the respective societies. In a letter to the Secretary, Mr. George Ward says, "Several of the students distinguished themselves by their success at the examinations in connection with the Science and Art Department, and on the whole their attention to the subjects of study was highly satisfactory. The interest manifested in the organic branch of the science was not equal by any means to that shown in the inorganic and practical." The students in Mr. Jefferson's class were also very successful at the examinations. There is a library of about 180 books, which can be obtained between 9 A.M. and 10 P.M. It is also open as a reading-room from 8 to 10 P.M. The number of books issued in 1869 was 170. The museum consists of a materia medica cabinet, containing 226 specimens, neatly arranged and labelled, in bottles and glass tubes, and various other articles. This collection was made by the Associates.

Leicester.—Of 25 assistants and apprentices who are members of this Association, 9 have passed eleven examinations during the last half-year, viz. 3 Minor, 2 Modified and 6 Preliminary. A prize of 5*s.* has been given in each class at the close of the last two sessions. Some assistance is rendered to the Association by the subscriptions of employers as honorary members. The library numbers twelve volumes, and is open once a week; subscription 1*d.* per week. There have been 35 issues of books during the last six months. The museum consists of one of Evans, Lescher, and Evans' 50*s.* cabinets of materia medica.

Liverpool.—In 1868–69 two members passed the Minor Examination, and in 1869–70 two more passed. There is a library of 565 volumes, open every day from 9 to 5, and on meeting nights from 7 to 10; there have been 290 issues of books in 1868–69. The museum contains a complete illustration of the materia medica of the British Pharmacopœia, and a good general collection of chemical and materia medica specimens.

Manchester.—In 1868–69 the lectures, in consequence of the passing of the Pharmacy Act and the small fees demanded, were largely attended, but were not self-supporting, the deficiency being made up by the Association. The classes are now arranged in connection with Owens College, that institution taking the fees and supplying the instruction. A chair of Pharmacy has been established at the suggestion of the Association. Great efforts are now being made to form a good library and museum. About £70 has been collected, and a suitable room engaged at a rent of £25 per annum. The library at present consists of about 70 valuable works of reference; the museum of about 130 furnished drawers, similar to those at Bloomsbury Square, and 50 dried and mounted medicinal plants. They are open three evenings a week from 6 to 10.

Newcastle-on-Tyne.—The classes for pharmaceutical education are in connection with the Pharmacy section of the Durham University College of Medicine, whose head-quarters are in Newcastle. To meet the requirements of "students in pharmacy" a lectureship in Practical Pharmacy has been instituted by the Senate of the University, a curriculum for such students has been recognised, and the lecture hours have been arranged as far as practicable to suit their convenience. A winter-evening course of lectures on Chemical Physics, by A. Freire-Marreco, M.A., Reader in Chemistry in Durham University, is not included in the tabulated return. There is a museum of materia medica, containing about 360 specimens, of which 200 are organic, the remainder chemical. Most of the specimens are good, both in quality and size, and are enclosed in the usual museum jars, arranged in glass cases at one end of the library. The specimens of organic materia medica were presented to the College some years ago by Mr. H. B. Brady, and require some additions to make the collection completely represent the organic materia medica of the present Pharmacopœia. The Library consists of several hundred volumes, but being the library of a medical college, to which pharmacy has only recently been added, it is as yet destitute of works suited to pharmacy students.

Nottingham.—The classes, confined to apprentices, most of them very young, have been successful, and the examinations very satisfactory. Arrangements are in progress for fitting up class and reading-rooms, library and museum. It is intended to institute during the winter months classes for the Preliminary Examination, Inorganic Chemistry and Pharmacy. Classes for Botany and Materia Medica are to commence in February, and continue during the spring and summer months. The library contains 74 volumes, and is open four times a week. Museum very small.

Plymouth.—The Chemistry and Botany classes are in connection with the Science School. No library. The Museum consists of a case presented by Mr. H. S. Evans.

Scarborough.—An attempt will be made to form a class during the winter. No library or museum.

Sheffield.—A collection of specimens of materia medica, chemical and pharmaceutical preparations, forming the nucleus of a museum. Also a small library, of 65 volumes, which it is intended to increase largely. The reading-room is open once a week from 8 to 10 P.M., but not much used. The Association also possesses a valuable microscope, which is lent to members on certain conditions. The educational course is not duly appreciated. The young men are evidently not fully awake to the requirements of the Pharmacy Act. The advantages of the classes have not been sought by those living in neighbouring towns. Access to the library and museum for purposes of reference may be had by members.

Sunderland.—The Society has two rooms, one for reading and the other for classes, open every evening. The nucleus of a library has been formed, consisting of 40 volumes, which it is expected will be increased by donations from the members. A cabinet of materia medica, and a few specimens of chemicals, form the museum. Arrangements are being made to form classes for the Preliminary examination during the ensuing winter.

Taunton.—Only a trade association, with no organization for educational purposes.

Provincial Transactions.

SUNDERLAND CHEMISTS' ASSOCIATION.

The First General Meeting of the Session 1870–71 was held in the Society's Rooms, Fawcett Street, on Monday evening, October 10th; HARRISON THOMPSON, Esq., Vice-President, in the chair.

Mr. J. J. NICHOLSON read a paper on the "Advance of Practical Chemistry during the past Year," describing some of the novelties shown at the exhibition of pharmacy at Liverpool; and explaining, by the aid of diagrams and specimens, the process for the manufacture of alizarine from coal tar; Mond's process for the recovery of the waste sulphur in alkali works; and Weldon's and Deacon's methods for the continuous production of chlorine.

At the close of the Address, on the motion of Mr. ROBINSON, seconded by Mr. J. HARRISON, a hearty vote of thanks was accorded to Mr. Nicholson.

Mr. J. HARRISON gave notice that at the next meeting he would bring forward a motion that steps should be taken to extend the exemption from juries to registered chemists and druggists.

It was announced that the next lecture in connection with the Society would be given by Mr. Sharp on November 7th.

After the transaction of other business, and the usual compliment to the Chairman, the meeting separated.

The work of this Society is now fairly inaugurated.

A library has been established; a reading-room, to which many of the leading medical and pharmaceutical periodicals are supplied, is open nightly, a course of lectures has been arranged, and classes have been formed for the instruction of the apprentices in the various branches of knowledge required for their examinations.

Proceedings of Scientific Societies.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Meeting at Baltimore.

The Eighteenth Annual Meeting of the American Pharmaceutical Association was commenced on Tuesday, September 13, in the Lecture Room of the University of Maryland, Baltimore, under the presidency of Mr. E. H. Sargent, of Chicago.

The President, after a few words of welcome to those present, referred to the concurrence in the time of meeting of two kindred associations in different and widely separated nations. He thought that as the British Pharmaceutical Conference was in session in Liverpool at that moment it would be appropriate to render something more than a formal recognition of the fact, and that some expression of interest in an Association having the same aims and speaking the same language was called for.

A list of forty-eight applications for membership from all parts of the country was read, and the applicants having complied with the requirements of the bye-laws were unanimously elected.

On the motion of Mr. A. B. Taylor, of Philadelphia, it was resolved unanimously that "the Secretary be requested to telegraph a fraternal message to the British Pharmaceutical Conference, now in session in Liverpool."

After reports had been received from various committees, the President read his Annual Address, which was well received. A committee was appointed to consider and report upon its recommendations and suggestions.

On Wednesday morning, after the minutes of the previous meeting had been read, the Secretary said that on the previous evening he had sent a telegram to Liverpool, in accordance with the resolution adopted:—

"Pharmaceutical Conference, Liverpool.

"Fraternal greetings of American Pharmaceutical Association. Maisch, Secretary."

About two hours later he received the following telegram, signed by the President of the British Pharmaceutical Conference:—

"American Pharmaceutical Association, Baltimore.

"The most successful meeting ever held sends hearty fraternal greeting."

Their English brethren had thus preceded them in time, and the messages passed each other *in transitu*.

The officers for the ensuing year were then nominated and elected, the office of President being conferred on Mr. Richard H. Stabler, of Virginia.

The Secretary then read the Annual Report, which referred specially to the regulation of pharmacy in the United States. It mentioned that the State of Rhode Island had adopted a law, compelling all persons desiring to engage in the business to pass a satisfactory examination before a committee of five pharmacists, appointed by the Governor. In New Jersey efforts were made to have a drug law passed by the Legislature, but they were not successful. It is expected this will be accomplished in the next meeting of the Legislature. The Maryland Legislature has passed a law, compelling all persons who intend to practise pharmacy in the city of Baltimore to pass a similar examination.

A list of queries was then submitted, thirty-seven in number; these had been prepared for acceptance, and the names of the persons who had agreed to prepare the replies for the next annual meeting were reported. Among the subjects referred to were—

I. The preparations of rennet, pepsine, and pancreatic juice, which have been recommended to assist assimilation of fat in the human stomach. In the course of the day Mr. S. M. M'Collin read a paper relating some of his experience in the preparation of pepsine. He prepared fluid preparation, in which glycerine was the chief preservative agent.

II. The system of apprenticeship and the amount of preliminary education to be required of apprentices. Interesting meetings were held by the delegates on the evenings of Wednesday and Thursday for the discussion of this subject, at which a series of resolutions were passed, which will be given in our next number.

III. Granulated effervescing compounds sold by druggists under popular names that do not correspond with their composition.

IV. The comparative value of carbolic acid and other disinfectants and antiseptics.

The reading of answers to queries of last year was then proceeded with, and occupied nearly the remainder of Wednesday and Thursday.

Mr. Joseph P. Remington, of Philadelphia, read a paper "On Glycerine," giving the results of some careful experiments on samples of the leading kinds in the market. The experiments showed conclusively that the lower grades of glycerine were unfit for medical use, while the best quality of several of the leading manufacturers were inodorous, colourless, free from impurities, giving with the usual reagents negative results in almost every case. The specific gravity varied from 1·245 to 1·253.

Dr. E. R. Squibb inquired if he had met with formic acid as an impurity, but Mr. Remington replied that he had not noticed it. Dr. Squibb stated that it had been asserted that that acid was the cause of the unpleasant symptoms in some cases where it had been used. To detect the unpleasant odour of glycerine, it was best to dilute it to about ten times its bulk with water, and apply heat, when the odorous principles are more readily distinguished than if it be heated alone.

The Secretary read a paper upon a case of poisoning by fluid extract of aconite, by Dr. S. P. Duffield, of Detroit, in which it appeared that there was culpable negligence of an *employé* of a large manufacturer, who had labelled a pound bottle, "Fluid Extract Actæa Racem.," instead of "Fluid Extract Aconit. Rad." The question would naturally suggest itself, how many more bottles were thus labelled, and had any others died from this criminal neglect? In the course of some remarks by Dr. Squibb and others, it was elicited that the odour and chemical reactions of *Veratrum viride* are almost identical with aconite; and that cimicifuga and aconite root have been found repeatedly mixed in the same package. It was also stated that owing to negligence on the part of the physician, who had written badly, or of the pharmacist, who had imperfectly translated the wretched hieroglyphics, fluid extract of belladonna had been substituted for taraxacum, and fluid extract of veratrum for valeriana.

Mr. William Procter, jun., contributed a paper on the assaying of opium to determine its contents of morphia. After narrating various processes conducted on several portions of the same solution of opium, Mr. Procter said that he preferred a slight modification of the present United States Pharmacopœia process, more familiarly known as Staple's process, which he thought would best meet the wants of pharmacists who desire to test this drug. The chief points to observe are to exhaust the drug thoroughly, evaporate with care to a small bulk, and, after adding alcohol to the remaining solution, to add the ammoniated alcohol, allowing it to stand 24 to 36 hours, preventing the loss of ammonia by evaporation.

Dr. Squibb said that in the case of opium, he always advised pharmacists to buy it already in powder and test it for themselves, With all other drugs he advised, on the contrary, that they should buy them whole and powder them themselves. He attributed the cause of the considerable superiority found in the morphia strength of some of the grades of opium to superior cultivation, care in preparation, and freedom from diluting substances.

Mr. B. F. Stacy, of Charlestown, Mass., read a very interesting paper on the "Honey Trade in the United States." From the statistics furnished, it appeared that the various States yield honey in the following order:—New York, North Carolina, Kentucky, Missouri, Tennessee, Ohio, Virginia, Pennsylvania, Illinois, Indiana; the yield of the other States was not given. In 1868, the total production sent to market was over 30,000,000 pounds, besides 212,000 gallons imported from the West Indies.

Mr. A. B. Taylor called attention to the resolution adopted at the National Pharmacopœia Convention, which directed the abolition of all measures of capacity, and showed some of the difficulties which would be met with in its practical application. Statements were also made by Dr. Squibb and others upon the subject.

Resolutions were passed tendering the thanks of the Association to Messrs. Gail and Ax, to Messrs. Maltby and Co., and Messrs. Thomas Kensett and Co., for the courtesy shown by them to the Association upon its visit to their respective establishments; also to the faculty of the University of Maryland for the free use of their hall for the purpose of the meeting.

Another resolution was passed thanking the pharmaceutists of Baltimore and their friends, especially the Reception Committee and the Local Secretary, for their endeavours to render the visit pleasant and social.

Before the meeting separated, however, it was decided to appoint a committee to take into consideration a suggestion to invite the International Congress of Pharmacists to meet in the United States in 1876, the committee to report upon the subject in 1871.

Messrs. Maisch (Philadelphia), Sargent (Chicago), M'Murdy (Albany), Menninger (Ralegh) and Ash (Jackson) were appointed a committee to report upon the legislative action upon pharmacy and the drug trade in the different States of the Union.

Dr. E. Hoffman (New York), Professor John Maisch (Philadelphia) and Mr. E. H. Sargent (Chicago) were appointed a committee to draw up an address of felicitation, embodying the kind sentiments of the Association on the occasion of the fiftieth anniversary jubilee of the North German Apothecary Association, and to forward the same to its permanent President Mr. William Dankworth, at Magdeburg, in the name of the American Pharmaceutical Association.

It having been resolved to reassemble at St. Louis, Mobile, on the second Tuesday in September, 1871, the Convention adjourned.

In connection with the meeting there was a very interesting and instructive exhibition of drugs, chemicals, druggists' sundries, materia medica and pharmaceutical preparations.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Wednesday, September 14th.

(*Continued from page* 316.)

Discussion on Facilities for Pharmaceutical Education in the Provinces.

The following communication received from the Secretary of the Pharmaceutical Society was read:—

"At a Meeting of the Council of the Pharmaceutical Society, held on the 7th September, 1870, it was resolved,

"That a copy of the following resolution of the Provincial Education Committee be forwarded to the General Secretaries of the British Pharmaceutical Conference:—

"*Copy of Resolution.*

"This Committee recommend that the Council invite the British Pharmaceutical Conference to bring forward the question of Provincial Education for discussion at its Meeting in Liverpool, in September, which would give an opportunity for the interchange of opinion amongst those best acquainted with the question."

The President expressed his great regret that his friend Mr. Schacht was unavoidably prevented from being present. It was very much to Mr. Schacht's earnest interest in the question of Provincial Education that its present prominent position was due. They were, however, fortunate in having amongst them the President of the Pharmaceutical Society, Mr. G. W. Sandford, and he would invite that gentleman to favour the meeting with any remarks which he might be disposed to make. He was glad to refer the meeting to the proof-sheets of a return on Provincial Education from 1868 to 1870, obtained by the Pharmaceutical Society, a supply of which had been forwarded for the use of those present.

The President of the Pharmaceutical Society, Mr. Sandford, said that in responding to the invitation made by his friend Mr. Stoddart, he felt that his own position there, during the present discussion, ought rather to be that of a listener than a speaker. The meeting would understand that some reticence was a duty in connection with his official position, since he could not lay down any special line of policy as having been agreed upon by the Society which he had the honour to represent. At the same time, he made no secret of his personal wish to promote Pharmaceutical Education in the provinces. It was impossible to ignore the fact that under the present transitional system, there were many masters who would not—he should hardly be wrong in saying could not—teach their apprentices the essentials of their duties in connection with pharmacy. Where, then, should this want be supplied? It was not to be expected that all young men could afford the means necessary to come up to Bloomsbury Square, and avail themselves of its curriculum, but if proper means were provided in the provinces, there would be no difficulty in young men fitting themselves to pass the Minor Examination very soon after completing their apprenticeship. When the Pharmaceutical Society was first established, one of its earliest proceedings was to open a school of pharmacy, accessible to young men at a very slight cost. It was by carrying on that sort of expenditure for a few years that the Society could help Pharmaceutical Education. "Providence helps those who help themselves," and the Society should only help those who were inclined to help themselves. Some persons suggested rewards for passing good examinations; others wanted something to go on with at the beginning. The Society wanted to encourage the schools which would send up lads for examination, and should in a moderate way give grants where there were lectures established and a sufficient number of pupils to warrant the grant. Some candidates came up from employers who had taught them so well that they were able to pass their examination without going into the Society's laboratory at all.

Mr. W. D. Savage (Brighton) said he had had thirty-eight years' experience of apprentices, and his opinion was that if they were afforded opportunities for study there would soon be a better class of assistants.

Mr. H. S. Alpass (Liverpool) said the difficulty was to find apprentices with a sufficient preliminary education to begin with. They had not a proper knowledge of Latin, and their general knowledge was defective.

Mr. Sandford remarked that the difficulty would be obviated if masters would agree only to take apprentices who had passed the preliminary examination of the Pharmaceutical Society.

Mr. F. B. Benger (Manchester) urged that there should be assistance afforded in scientific education during apprenticeship; and that there should be a special technical school which would give instruction in sound elementary knowledge of chemistry, botany and materia medica.

Mr. Abraham (Liverpool), in reply to a question, said that for the last twenty years the Liverpool Chemists' Association had provided classes and lectures free to the apprentices, but the number of pupils had been and still remained extremely small. But he quite expected that the stringent changes already effected in the state of the law permitting the practice of pharmacy would compel a very much larger number to seek scientific instruction. The means provided in Liverpool had been ample,—good instruction in the classes and free lectures of the best character, yet they had been poorly attended; the apprentices and assistants to whom the opportunities had been offered either did not know their necessity, or they were unable or unwilling to take advantage of them. The lecturer on chemistry was Mr. Edward Davies, the secretary of the local committee of that Conference. He (Mr. Abraham) was anxious that the rudiments of chemistry should be taught in secondary schools for boys, so that they might have the groundwork of the science before commencing their special technical training. That such a system was practicable had been convincingly shown in a large and excellent school in Liverpool, where about eighty boys had at once passed the Government examination in chemistry.

Mr. H. Matthews, F.C.S. (London), said that as a former pupil of the City of London School, he could not refrain from naming its early and earnest labours in promoting science-teaching. A sufficient number of years had now elapsed to judge of the fruit of such a system, and they found accordingly that amongst the old pupils of the City of London School the following well-known chemists could be ranked, viz., Messrs. Perkin, Bloxam, Spiller, Heaton, Divers, etc., whilst other departments of science included amongst their active workers the former students of the same school. It was unquestionable that the future tastes and pursuits of the man depended upon the bent given to them during boyhood.

Mr. E. Bremridge, Secretary and Registrar of the Pharmaceutical Society, said that most of the failures of students to pass the Minor Examination arose from deficient elementary education. He thought that masters should require every youth to pass the Preliminary Examination before he commenced his apprenticeship.

Mr. Mackay (Edinburgh) cited his own apprenticeship to show the extreme difficulty that formerly existed for study. When he was an apprentice he used to steal from his meal times one hour for the study of pharmacy and another for materia medica. The system of apprenticeship in Scotland differed from that of England. The apprentice did not reside in the house, and his parents paid no premium; but, on the other hand, the employer paid a small salary, which might be progressive or not. About twenty years since, the chemists of Edinburgh mutually agreed that they would make it a condition of every apprentice's indenture that his friends should pay the fees for his attendance upon classes in chemistry and materia medica, the master covenanting at the same time to allow sufficient time. He and some other chemists in Edinburgh still adhered to this system. In Scotland now chemistry was being taught in most schools. It is also extended to ladies' schools. Physiology and chemistry were taught in the High School of Edinburgh, and a regular lecturer was appointed. There was, therefore, no excuse for lads going into the establishment of a chemist and druggist without passing the Preliminary Examination. The Pharmacy Act gave the pharmacists much power, and they ought not to take an apprentice without he could produce evidence that he had passed the Preliminary Examination of the Pharmaceutical Society—an examination not over-severe or over-strict.

Mr. H. C. Baildon (Edinburgh) confirmed the statements of the previous speaker, and concurred in his opinions.

Mr. A. T. Horton (Liverpool) referred to the limited attendance on the classes of the Liverpool Chemists' Association as described by Mr. Abraham, and suggested that it might partly be accounted for by the fact that there were in the town many other classes for instruction in chemistry.

Mr. H. B. Brady (Newcastle-on-Tyne) wished to make a few remarks on preliminary education. Firstly, with reference to botany. It had been his intention, till quite a recent period, to have made a communication to that meeting on the *means* of teaching botany, supplementary in some measure to Mr. Schacht's paper of last year. Mr. Matthews had spoken of the importance of the bias given to the mind at an early age. This was eminently true of botany; and whilst they knew that at Professor Henslow's village schools, where the scientific teaching absorbed but an hour or two per week, girls of from ten to thirteen years of age acquired an excellent knowledge of English botany, it was monstrous to suppose that it presented any difficulties for pharmaceutical students. But *method* of teaching was a most important point. Let botany be regarded in the first place as a subject for observation rather than one of mere book definitions. The Sunday afternoon walk would yield material for study; but if not, the student had a fair claim on his master for the medium of time necessary for the purpose, and he could not believe it would ever be refused. Professor Oliver's 'Elementary Lessons in Botany' would stand in the place of a teacher. As to the general question, and the modes of facilitating provincial education, he had last year given some account of what had been done at Newcastle, viz. the establishment of a chair of practical pharmacy in the University of Durham (the medical faculty of which has its head-quarters in Newcastle), and the institution of a distinct programme for students in pharmacy. Many present at that meeting had thrown doubt and distrust on the association of pharmaceutical with medical students, and it was gratifying to be able to report on the authority of Mr. Freire-Marreco, the reader in chemistry, that so far as could be observed the arrangement worked in every way satisfactorily. He maintained that if the experiment should go on as satisfactorily as it had begun, it would, in their case at least, be a distinct waste of teaching power to separate the two classes of students. It was interesting to find that an arrangement almost exactly identical, even to the amount of fees demanded, was already in vogue at Chicago. Whilst they were calling upon medical men to refer to them in matters touching chemistry, materia medica and the like, he (Mr. Brady) thought it absurd to fix a lower standard of education and shorter courses of lectures for pharmaceutical students than medical students themselves enjoyed.

Mr. Sutton (Norwich) lamented the want of opportunities afforded for instruction in some districts. Norwich, for instance, did not yet possess the means of scientific instruction which Liverpool had. The remedy for the difficulty mentioned by Mr. Alpass was in the hands of the pharmacists themselves. He would not take an apprentice under sixteen years of age, and unless the youth was well educated.

Mr. Ekin (Bath) said he was surprised that no mention had been made of the Government scheme of education, which, he thought, would go far to get us out of our difficulties. The second-grade schools which were shortly to be established all over the kingdom would give just the education that was required. The scheme was to give a boy a thorough knowledge of his own language, to enable him to read Latin easily, and to give him a sound elementary knowledge of chemistry, botany and physics. If only the Pharmaceutical Society would require in addition to the subjects now insisted upon at the Preliminary Examination a thorough elementary knowledge of chemistry, botany and physics,

—and by an elementary he by no means meant a superficial knowledge,—they would get just the class of pharmaceutical students they wanted. He did not believe in the science-teachers holding certificates from the Science and Art Department, who were for the most part men of deficient education, and who would entirely fail to command the respect of boys of the class from which pharmacists were taken; and he need hardly say that if boys had no respect for their teachers, they would get but little benefit from their teaching. If needs be, and until these second-grade schools, as they were called, were fairly established, technical schools, as recommended by his friend Mr. Benger, would fill up the void; but he thought they need not be under much concern about ways and means; only let the Pharmaceutical Society create the demand by their requirements at the Preliminary Examination, and the supply would quickly arrange itself.

Mr. Savage (Brighton) suggested that in publishing the names of those who passed the Minor Examination, the names of the institutions where their education had been obtained might be added.

Mr. Payne (Wallingford) wished to call the attention of the meeting to the position of pupils in small towns, where there were insufficient numbers to employ combination.

Mr. R. Sumner (Liverpool) said that it had always been an opprobrium to their local Chemists' Association, that it received so little support from Associates. He felt strongly upon the extensive and growing refusal of the larger establishments to receive apprentices,—a refusal which some of them even blazoned abroad, adopting as a motto, "No apprentices taken, and no arsenic kept on the premises." He held that this was an evil which required correction.

Mr. Dymond (Birmingham) said that they need not be too anxious about young men availing themselves of the means of instruction. The legal position would now compel them to do this. For the subjects required by the Preliminary Examination, Government Science Classes might be looked to as valuable auxiliaries, and they saw how extensively such subjects as chemistry were being introduced into middle-class schools. Doubtless, much remained to be done, for whilst there were about 8000 chemists and druggists in Great Britain, he only found 245 students recorded in the returns on provincial education as attending classes in chemistry. He thought that they should appeal to the Government to aid such science-teaching.

Mr. Martindale (London) feared that the distribution of aid from the Pharmaceutical Society would produce local jealousies, and that the smaller towns would be neglected. He agreed with Mr. Ekin that the elements of chemistry and botany should be introduced into the Preliminary Examination. The School of Pharmacy at Bloomsbury Square had now spread over the country a large number of well-trained pharmacists, to whom we might look as competent teachers of Materia Medica.

Mr. Atherton (Nottingham) gave the experience of the Local Chemists' Association to which he belonged, and said that all the assistants and apprentices of the town had joined it. In the organization of lectures, it was most desirable that they should be delivered by those who knew the exact requirements of the students of pharmacy, since a want of this knowledge on the part of medical or other lecturers had sometimes defeated the object of the course.

Mr. M. Murphy (Liverpool) continued the discussion.

The President agreed with Mr. Alpass as to the importance of primary education, and regretted that the education of the present day was getting too superficial, the simple fact being that pupils neglected to learn how to spell. In the Crimean war many dispensers were thrown out because of their inability to spell even one-syllable words. Few persons who had not given special attention to this subject would credit the extent of the evil. He had examined a class of five boys, supposed to be prepared for the Preliminary Examination, and, upon dictating a sentence of words of one syllable, none of the boys made less than three mistakes in the spelling. It had long been a rule with him to give time for instruction to his assistants and apprentices. He wished to take that opportunity of commending to the notice of all their young men the admirable little work by Professor Oliver, entitled 'Lessons in Elementary Botany.' The use of this text-book would afford a very delightful introduction to the science.

Mr. R. Reynolds (Leeds) could not allow the discussion to end without alluding to the facts disclosed by the printed return on provincial education, of which the proof-sheets were before the meeting. It appeared to him a hopeful circumstance that, in several towns, there was already provision for teaching some of the subjects required in the technical training of pharmacists. It was to the aid and extension of these existing means that they should look. He must specially allude to the experiment which had been made by the University of Durham, in connection with the College of Medicine at Newcastle-on-Tyne, where sixteen students had paid a fee of six guineas each for perpetual tickets to a full curriculum of pharmaceutical education. In the discussion of this subject last year, several members, including himself, had expressed doubts whether the affiliation of schools of pharmacy with those of medicine would be to the interest of the former. It was now placed on record by their friends in Newcastle, as the result of a year's trial, that no inconvenience had been found, and that they were pefectly satisfied with the arrangement. If this continued to be the case in the future, it would much simplify their task, since there were eight or nine other towns having schools of medicine, to which the system could be extended. He (Mr. Reynolds) hoped that they would not overlook the necessity for thoroughness in any system to which they gave their sanction. Now that a certain standard of professional training was required by law, students must be prepared to be thorough; and those providing the classes must not let their duties to be performed a *dilettante* spirit. It must be a serious part of tha work of the day, and not merely depend on spare time.

The Conference adjourned at 12.30 p.m.

Parliamentary and Law Proceedings.

Worship Street Police Court, *October 17th.*

BEFORE MR. NEWTON.

Miss Alice Maud Kemp was charged with having attempted to commit suicide by taking laudanum. A police-constable said, that on Saturday night, having been called to a house in Stoke Newington and told that a young lady had taken poison, he went upstairs and found the prisoner in a state of semi-insensibility. He was informed that she had taken something from a bottle, and a small phial was shown him which smelt of laudanum. A medical man attended, and she gradually recovered. She told witness that she had procured the laudanum from Mr. Cooper, of Amherst Road, and had bought an ounce and a half.

A solicitor here said he appeared on behalf of Mr. Cooper.

Mr. Newton said that no doubt Mr. Cooper would be called on to answer what had been stated against him, but at present he was not before the Court. He had better attend on a future day.

The prisoner was remanded for a week.—*Standard.*

Notes and Queries.

*** *In accordance with a wish expressed by numerous correspondents, a column will in future be devoted to notes and queries, with the object of facilitating the exchange of information among members of the trade and students.*

In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.

[2.]—MOUNTING MICROSCOPIC OBJECTS.—*R. J. M.* may mount sections of leaves, wood, etc., for the microscope, as follows:—Make several sections, which may be roughly viewed under the microscope, with the object of choosing the thinnest and most regular one for the purpose. Having done this, place it on the centre of one of the glass slides that are sold for the purpose by most philosophical instrument makers, and carefully drop on it one or two drops, or just sufficient to cover it, of Canada balsam. One of the very thin little squares of glass, which are also sold by the above, is now carefully dropped on to the object, and the slide has then to be heated very gently over the flame of a spirit-lamp to dispel any air-bubbles that may have formed, and this part of the process is very essential. The slide should be put away for a week or so to dry, either on the top of a bookcase or the cabinet-work of the shop. It will have been sufficiently long when the superfluous balsam that has oozed out from the sides is found to be quite hard. This should be carefully rubbed off the glass with a little turpentine, or cut and scraped off, and, the name being appended, the slide is complete. This is a simple process, which will render most opaque organic substances transparent and permanently mounted.—"GIVE AND TAKE."

If *R. J. M.* will forward his address to Mr. Alfred Laslett, Market Place, Hadleigh, Suffolk, that gentleman will be happy to give him a few hints on mounting microscopical objects.

[3.]—PATENT MEDICINE LICENCE.—*T. Marshall* is informed that chemists keeping more than one shop are required to take out only one licence for the sale of "patents," etc.—"GIVE AND TAKE."

COMPOUND SALTS.—*Major Associate*, in reply to "*Spes*," refers him to the manufacture of hydrochloric acid (HCl); the acid of pharmacy is obtained by the action of sulphuric acid on chloride of sodium, the resulting gas being dissolved in water. The following represents the decomposition which takes place:—

$$\left.\begin{matrix} 2\,NaCl \\ H_2SO_4 \end{matrix}\right\} = \left\{\begin{matrix} Na_2SO_4 \\ 2HCl \end{matrix}\right.$$

showing that hydrochloric acid is a *compound* of hydrogen and chlorine. He would also refer "Spes" to sulphuric acid (H_2SO_4), oxide of antimony (Sb_2O_3), ferrous sulphate ($FeSO_4$), and ferric sulphate ($Fe_2 3SO_4$); the decompositions occurring in the manufacture of each of these compounds are given in Attfield's 'Chemistry.'

[6.]—ESSENCE OF COFFEE.—*R. J.* (Manchester) desires to be informed what is the best method of making essence of coffee.

[7.]—CHILBLAINS.—*J. W. D. H.* (Yorkshire) would feel obliged if any of our readers would tell him of a remedy for chilblains "to be taken internally."

[8.]—PATENT MEDICINES.—"*Socius*" wishes to know whether any registration, certificate, or special licence is required for the introduction of a new patent medicine.

[9.]—GREEN FIRE.—*T. M.* (Nottingham) wishes for a good recipe for making green fire.

[10.]—WHOLESALE DRUGGISTS' ASSISTANTS' SOCIETY.—*J. Hart* (Bow) having heard that the assistants in the wholesale drug trade are about to form a society, which would afford them the means of interchanging trade opinions and tend to improve their social and intellectual position, would feel obliged by any of our readers furnishing him with further information on the subject.

[11.]—AUSTRALIA.—Can any of your correspondents inform me what chance there is of a druggist, with moderate capital, succeeding better in Australia than in this country? —W. MILLER.

Correspondence.

Communications for this Journal, and books for review, should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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

THE POISON QUESTION.

Sir,—I hope the action taken by Messrs. Brown and Reynolds, and those who joined them at the Council meeting held on the 5th instant, will meet with the hearty approval and appreciation of the majority of the members of the Pharmaceutical Society and of druggists generally. I imagine that the recommendations made by the late Council were sufficiently well understood, and had for their object the compulsory adoption of one or other of the methods suggested for the storing and selling of poisons, and that the objectionable feature in the scheme was that it was to be made compulsory, and, of course, to be attended with the obnoxious machinery of inspector, etc., to ensure its being put in operation.

I do not think the number of cases of accidental poisoning, arising from carelessness on the part of chemists, calls for such interference with their rights and privacy as the making imperative of any such measure necessarily would.

At the general meeting Mr. Haselden, in seconding the adoption of the regulations, said, "that it was much better to saddle themselves than let anybody else do it," but is it not best not to be saddled at all?

Let the Council be united and object to any scheme, by whomsoever proposed, which has for its object the fettering of the members of our profession.

I trust that the compulsory scheme will again be successfully opposed.

JOHN R. THOMPSON.

Bishopwearmouth, Sunderland, Oct. 18th, 1870.

"EXTRA CHARGES AFTER OR BEFORE BUSINESS HOURS."

Sir,—There are very few assistants or apprentices but are rejoiced to see this subject brought forward. It is one which exerts great influence on their future mental prospects.

How many of us are there who, by reason of frequent interruptions, are prone in despair to cast aside, *pro tem.*, "Attfield," "Royle" or "Bentley," the study of which demands close application! The experience of many will doubtless coincide with mine, that often the greater part of the evening's business is done between 8 and 10 o'clock. That such a state of things should continue is what I hope few will affirm. I beg to suggest that as it does not appear (to me) to be a subject for the "Council," the local secretaries should take the matter in hand. Let them canvass the chemists in their own districts, and, having obtained the signatures of those willing to adopt the plan, advertise it with the signatures appended in the principal local papers,—say, for four weeks,—the expense of which I am sure would be cheerfully borne by the assistants and apprentices.

Of course the extra 25 per cent. would be at the disposal of the chemists themselves, but I hope it would be willingly devoted to the benefit of Associations or to the Benevolent Fund.

I look forward to the time when we shall cease, like the medical men, to be at the beck and call of the public, without extra charge.

October 18th. H. B.

NOTES AND QUERIES.

Sir,—I congratulate you on the new feature introduced in the last number of the PHARMACEUTICAL JOURNAL; I refer to the space you intend devoting to "Notes and Queries." Doubtless the advantages will be incalculable, if our members only enter into the matter with spirit and "give and take" in their ideas for the general weal of our body. In one of your contemporaries—*The English Mechanic*—the system has been found to answer so well, and the readers have been so generous in their anxiety to help their brother readers in all subjects, whether mechanical, chemical or philosophical, etc., that that part of the work alone, in itself, forms quite an encyclopædia of useful information and formulæ. I should like to see our "Notes and Queries" answering the same useful ends.

May I also suggest that the "Queries" and "Answers" be both prefixed with a number and the name of the subject in large type, and that should the "Queries" remain unanswered for two weeks, that the number be again inserted under a list called "Unanswered Queries," as many contributors would not answer some of the queries, thinking that others would be sure to reply to them. And, again, should two or three answers, differing in detail, be given to the same query, I think that they should be inserted, thus affording a choice of replies to the querists.

Wishing the new feature every success.

October 17th, 1870. J. Ross Faulkner.

Poisonous Feeding Bottles.

Dear Sir,—About nine years since my wife used a feeding-bottle, having a glass tube reaching to the bottom, armed with a tip of vulcanized india-rubber; in the night she observed an offensive smell from it, and, calling my attention, I found the disgusting odour of sulphuretted hydrogen very strong. I at once got up and washed it, but not until I had used pure chlorine could I get rid of the smell; of course we did not use the bottle again. In the morning the child's body was inflated and very tense, and we have no doubt but that a few minutes more use of the bottle would have proved fatal.

The milk, which was perfectly new, was thus prepared:—

2 oz. new milk, mixed with 2 drams sugar of milk, dissolved in 2 oz. hot water and a very little salt added.

I presume the sulphur of the vulcanized india-rubber acted on the hydrogen of the milk, but whether the process was facilitated by the presence of salt or the sugar of milk, I do not know. We ever after used the plain old bottle and calves teat, fitted with sponge, well washed with hot water every time, and the teat taken off and kept in spirit.

Plymouth, October 17th, 1870. F. P. Balkwill.

Dear Sir,—Your correspondent C. B. N. asks for a little information respecting feeding-bottles, in consequence of a statement made by Dr. W. L. Emmerson; which statement he considers singular, but the truth of which is beyond a doubt. If I understand your correspondent correctly, he wishes to know what chemical change takes place in the milk, which would cause it to become poisonous? I will endeavour simply to explain it to him. The following is the composition of milk:—

Water	858
Casein	68
Butter	38
Sugar with extractive	30
Salts	6
	1000

The casein comes under the head of the nitrogenous food-stuffs, which compounds are essentially necessary to build up the principal tissues of the body, as muscular fibre, nervous substance, etc. Now it is well known that the nitrogenous compounds are most easily decomposable; and though, as in milk, the sugar and salt are sufficient to preserve the nitrogenous principle, casein, when in the living tissues, they are not in sufficient quantity to preserve it when out of the living tissues. Casein is under the most favourable circumstances for decomposition when allowed to remain for any length of time in an india-rubber tube with warmth applied. Though the nitrogenous compounds are so very essential in building up the tissues, they are, nevertheless, when decomposed, most poisonous. If taken into blood-vessels by the absorbent in only small quantities, pyemia, or blood-poisoning, takes place, and death in the majority of instances is the result. Can these unfortunate circumstances take place through the means of feeding-bottles? I believe they can; and, moreover, I believe hundreds of children die annually of pyemia, caused through the decomposition of casein in the tubes of feeding-bottles. I do not for one moment blame the feeding-bottles, the blame rests entirely upon those who have the management of them; in short, it is for want of cleanliness. I would recommend that the tubes be no longer than six inches; that the milk which is put in the bottle should always have a little salt and sugar added to it; that every time the bottle is used, the teat and pipe should be separated, and with the aid of the tube-brush well washed out with salt and water; the strength of which solution should be a small teaspoonful of salt to one pint of water. If these precautions are taken, no one need fear blood-poisoning by means of feeding-bottles; and their safety will be equal to their use, which is great.

Thomas Pemberton.

Birmingham, Oct. 17th, 1870.

Pharmacy and Medical Practitioners.

Sir,—"Reformer," the *Lancet* correspondent, appears to me to be writing on a subject of which he knows nothing at all; and in writing thus only exposes his ignorance to those "dignitaries" whom he so contemns. If a doctor of any standing at all, he ought to know that an ordinary prescription does not easily cost from 2*s*. 6*d*. to 3*s*. Of course, if there should be mixture, pills and ointment on one prescription, it may easily cost 2*s*. 6*d*. or 3*s*.; but an ordinary prescription contains a mixture only, which would be charged 1*s*. 9*d*. or 2*s*. at the most.

"Reformer" says that "people whose family doctor does not supply his own medicines find their drug bill is equal to, or even exceeds, their doctor's bill." Granted that a chemist gets 3*s*. even for a prescription, we will suppose written by "Reformer," I think that he ("Reformer") would be something more than astonished at his patient if he offered him only 3*s*. as his fee; and if a doctor's practice is among so poor a class that he can only get 3*s*. as his fee, it is very certain that it is impossible for a chemist to get 2*s*. 6*d*. or 3*s*. for the medicine. And yet "Reformer" states as a fact that the patient's drug bill equals or exceeds the doctor's.

Mr. Mee, in commenting on "Reformer's" letter says, "It seems a most extraordinary fact that a chemist in one part of town should charge as much for preparing a prescription as a licensed apothecary or medical practitioner should charge for both visit and medicine in another." As Mr. M. is a chemist, he ought to know that such is not the case. That a chemist at the West-End charges more than one at Highbury we can all understand; for a man who pays £300 or £400 rental cannot be expected to charge the same as one whose rent is only £60, and whose general expenses are in the same ratio. But I do not think that Mr. M. knows of an instance where a surgeon's fee for visit and medicine is as little as the chemist's charge for medicine only. As Mr. Mee dispenses for a surgeon, it is very possible that he speaks feelingly when he says, "We must be friendly with them (the doctors), for they are our best friends;" but I fail to see as yet in what way they are "a most generous race."

So long as practitioners persist in prescribing medicines in such concentrated forms as now appears to be general, they must not be surprised if their patients' bills are rather heavy. I have to-day dispensed for a surgeon the following prescriptions:—

No. 1.

℞. Tr. Cinchonæ Simpl. ℥iv
Ft. Mist. Sig. ʒj bis die ex aq. sd.

No. 2.

℞. Tr. Cinchonæ Co. ℥iij
Acid. Nitr. dil. ʒiv
Tr. Aurantii ʒiv.
M. ft. Mist.

Two teaspoonfuls three times a day in a wineglassful of water.

It is a curious, though an undeniable fact, that the surgeon who dispenses his own medicine prescribes the most simple remedies, and not in a concentrated form. Another grievous sore with "Reformer" is chemists' prescribing, and he insinuates that they do harm rather than good. What would he say to a doctor who ordered tr. lyttæ for a child suffering from hooping-cough? If a chemist ventured to prescribe it he would be put down as an ignorant man, to say the least. I know, however, a M.R.C.S. who ordered it. So far as my experience goes, I think that chemists cure their patients sooner than medical men. If doctors would give up dispensing, the chemists would give up prescribing, but not till then, I think.

Bristol. An Assistant.

Sir,—In noticing the communication of Dr. Leslie, I hope that gentleman will do me the justice to remark that I have not in any degree reflected upon the position or practice of the honourable section to which he belongs, namely, the physicians, who are, indeed, our best friends, and whose function, although exercised upon a higher level, does not conflict with the interests of pharmacists; as for the "position" we occupy, and our intelligent appreciation thereof, the learned doctor may find an illustration in the correspondence which appears in your weekly columns. The chemists would not have assumed the defensive had it not been for the unscrupulous attacks of the *Lancet*, which are not only insulting to an educated body of men, but amount to a gratuitous offence against the good manners that regulate our social system.

NON-MALCONTENT.

BRIGHTON CHEMISTS' PRICES *versus* BRIGHTON CHEMISTS' ASSOCIATION.

Sir,—Having read in the Journal a letter of Mr. W. D. Savage on the Brighton Chemists' Association, I wish to offer a few remarks in connection with that subject.

Having been for the last few months in Brighton, I have become acquainted with the "cutting" system prevalent there, of which I give the following instances:—

A six-ounce saline mixture for 6*d*. A quarter of a pound of tartaric acid for 4½*d*. Epsom salts, two ounces for 1*d*. Prepared chalk, 1½ oz. for 1*d*. Camphorated chalk, 3*d*. per oz. Citrate of magnesia, 2*d*. per oz., etc.

Now, I am persuaded that where the trade is divided against itself by such a system of underselling no Chemists' Association will stand, and no brotherly feeling can possibly exist.

A PHARMACEUTICAL STUDENT.

SPECIFIC GRAVITIES AND VOLUME MEASURES.

Sir,—In your report of the discussion, which followed the reading of my papers on "Specific Gravities and Volume Measures" at the Pharmaceutical Conference, it was stated that "the contents per ounce were coincident with the specific gravity" (solid contents being referred to). On making reference to my notes and memoranda, I find that as regards the class of fluids I have been operating on this rule does not apply, or make any approximation to the truth, and, therefore, the statement ought to be corrected.

As examples I will give two or three instances:—

Vin. Ipecacuanhæ,	sp. gr. 0·993……	solid contents,	19·2	per oz.
Tinct. Hyoscyami	„ 0·937……	„ „	18·35	„
Tinct. Opii	„ 0·940……	„ „	18·79	„
Dec. Sarsæ Co.	„ 1·027……	„ „	50·00	„

As applied to solutions of sugar and salts the approximation will be closer. A solution of pure sugar containing 30 grs. to the ounce has a sp. gr. of 1·028.

F. M. RIMMINGTON.

UNG. AQ. ROSÆ AND TINCTURÆ.

Sir,—As medical gentlemen occasionally order ung. aq. rosæ in their prescriptions, is it not desirable that dispensers should have a recognized formula for it? Nearly every establishment having its own recipe and *modus operandi*, each would prepare a prescription containing the above differently from every other; a result not at all in accordance with "uniformity in physic."

The Pharmacopée Française contains a formula, and (if I were *F.* instead of A. P. S.) I would suggest the following modification for insertion in a future edition of the B. P.:—

Ceræ Albæ ℥j
Cetacei ℥ij
Olei Amygdalæ f℥x
Aquæ Rosæ f℥iij
Tinct. Benzoini ♏xx. F. s. a.

The benzoin and the small quantity of aqua render it less liable to change than would be the case were the former omitted or the latter augmented, and that is a desideratum in a pharmacopœial preparation.

While I am on the theme of the B. P., perhaps you will permit me to say it is my opinion, founded on observation and practice, that it would add much to attaining "uniformity in physic" if tinctures were required to be kept at least one month before being used, so as to allow time for that peculiar change to take place which most vegetable solutions undergo. Tinct. aurantii, for instance, when prepared, either by maceration or percolation, from recently dried peel or from fresh peel, grows much darker and developes a finer flavour after three or four weeks. Of course the remedy for this, in respect of colour, is to use stale peel in which that resinous change, alluded to in PHARM. JOURN. Vol. XI. p. 604, has taken place. But there is no remedy, except time, for others, such as squills, colchicum, etc.

Now with regard to tinct. calumbæ, why not use the root in coarse powder instead of "cut small"? the result is far more satisfactory. The colour is richer because more calumbate of berberine (?) is taken up, and there is little or no amylaceous deposit.

The mortar instead of the knife is resorted to in the case of tinct. rhei, a proceeding which, at one time, would have been thought very unpharmaceutical.

H. E. GODFREY.

"*Ignorans*" (Tamworth).—Sulphate of lime and caustic potash would be formed.

C. C. (Taunton).—(1.) Ten ounces. (2.) In London to send ten ounces.

M. P. S. (Liverpool).—The *dilute* acid is obviously intended. We should dispense the prescription with this acid.

A. P. S. (Liverpool).—SARSAPARILLA AND QUININE.—(1.) Add the *simple* fluid extract of the B. P. to a solution of the quinine in a slight excess of dilute sulphuric acid. (2.) Probably a combination of quinine with astringent matter. Filtration would not be justifiable.

"*A Cliftonian*" (Windsor).—We know of no form for this preparation. We should suppose 1 to 5 a convenient preparation.

G. H. H. (Helensburgh).—(1) GLYCERINE CREAM. Beat almonds into a thick emulsion with water, strain, dilute, and add q. s. glycerine and otto. (2) We know of no such preparation, but it might be readily made by dissolving 5 grains of the scaly preparation in each drachm of water.

T. H. C. (Southsea).—We cannot explain the difference. The appearance should be that described as belonging to the lotion dispensed by yourself.

A. E. J. (Norwich).—We confess to being not philosophical enough to answer your question.

"*Englishman*" (Leamington).—Wanklyn and Smith's *Water Analysis*, Bowman's *Medical Chemistry*.

G. K. (Surbiton) and *Caradoc Jones* (Ebbw Vale) are informed that an article giving advice to students preparing to pass the examinations of the Pharmaceutical Society has been reprinted, and may be had on application to the Registrar.

"*Inquirer*" (Pontypool).—Such sale is not illegal, prussiate of potash not being a poison.

We have received a communication from Mr. Condy, which shall receive early attention.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. T. B. Groves (Weymouth), Mr. C. Umney (London), Mr. F. P. Balkwill (Plymouth), Mr. J. R. Faulkner (London), Mr. F. Buck (Chelmsford), Manager of the Floriline Company, The Committee of the Burgoyne Testimonial, Mr. Chapman (Manchester), Messrs. Jones and Son (Worksop), Mr. Wood (Barnsley), Mr. Reynolds (Leeds), Mr. C. R. C. Tichborne (Dublin).

The following journals have been received:—The 'British Medical Journal,' Oct. 15; the 'Medical Times and Gazette,' Oct. 15; the 'Lancet,' Oct. 15; 'Nature,' Oct. 13; the 'Chemical News,' Oct. 14; 'Journal of the Society of Arts,' Oct. 13; 'Gardeners' Chronicle,' Oct. 15; the 'Grocer,' Oct. 15; the 'English Mechanic,' Oct. 15; the 'New York Druggists' Circular' for October, from Mr. Deane: the 'Baltimore Gazette,' Sept. 17; the 'Canadian Pharmaceutical Journal' for September; the 'Journal of Materia Medica' for August and September; 'Neues Jahrbuch für Pharmacie,' numbers for February, March, April, May, June, July, and August, from the Editor.

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed for "Pharm. Journ."*

RATIONAL THERAPEUTICS.

In the introduction to a course of lectures just commenced, Dr. Richardson treated of the method to be followed in studying the relation between remedies and their effects, illustrating the connection between variation of physiological power and variation of chemical constitution by reference to the ethyl compounds. The radicle ethyl furnishes a multitude of compounds that are analogous in possessing narcotic power; commencing with the hydride $\left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}$ which is in composition least removed from the radicle itself, we find it is a gas, insoluble in blood and negative in its action on nervous material; hence it is not active either as an excitant or as a narcotic. It must be inhaled with air in the proportion of 30 or 40 per cent. in order to produce any decisive effect. Then it acts like nitrogen, producing temporary insensibility by interfering with the respiratory process, which cannot be sustained.

Again, alcohol $\left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}O$ (which differs from hydride of ethyl by containing oxygen and from water $\left.\begin{matrix}H\\H\end{matrix}\right\}O$, in having ethyl in place of half its hydrogen) is a stimulant and narcotic. It acts directly on the nervous system and excites the action of the heart. Given freely it induces deep narcotism, but as it is largely absorbed by the blood, a great quantity of it is required before there is sufficient saturation to induce narcotism. Hence it is not difficult to make an animal insensible with alcohol vapour.

Replacing the whole of the hydrogen in water by ethyl, we obtain ether, $\left.\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right\}O$, a powerful narcotic, having less direct stimulating action than alcohol, but producing its effects more rapidly. Being less soluble in blood than alcohol, it may be administered by inhalation of its vapour so as to saturate the blood, and then it acts as a narcotic. Still it is too soluble, and is, therefore, wanting in potency, so that we are obliged in using it to keep up the saturation by persistent administration to the exclusion of much air. Thus symptoms of asphyxia and restlessness are often produced, which prevent the use of ether.

In the chloride of ethyl, C_2H_5Cl, we have a substance which produces great excitation of the heart and deep narcotism. Being sparingly soluble in blood the saturation necessary for this effect is soon reached. But like chloroform, which it resembles chemically, this substance produces rigid muscular contraction as it narcotizes; it also causes vomiting, and, by arresting first respiration, then the action of the heart, it kills, as chloroform does, when its administration is continued too long.

The iodide of ethyl produces with narcotism great excitement of the heart and circulation as well as free glandular secretion.

Bromide of ethyl, C_2H_5Br, possessing good physical qualities for a volatile narcotic, produces deep narcotism and but slight muscular excitement, though to some extent, like the chloride and iodide, it excites, causes vomiting and irritates the mucous surfaces.

Sulphide of ethyl, $\left.\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right\}S$, produces rapid narcotism without excitement, and though with frogs the insensibility may be sustained for many hours without death, it induces paralysis of the nervous centres supplying the heart and the muscles of respiration.

Nitrite of ethyl, $C_2H_5NO_2$, produces, besides narcotism, a general paralysis of the nerves governing the contractile function of the blood-vessels, causing suffusion of the face, and rapid action of the heart.

A similar series of relations between constitution and physiological action is found in the amyl series. Between the actions of the ethyl and amyl series there is a difference in regard to what Dr. Richardson calls persistency of effect, due, he considers, to the radicle amyl being richer in carbon and hydrogen.

Dr. Richardson ascribes the narcotism in all these cases to the ethyl of the several compounds, and the phenomena which lie outside the narcotism he considers to be referable to the various other substances with which it is combined. He considers that wherever a basic element or radicle exists it always plays a part of its own, at the same time modifying the action of the substances with which it may be united but not destroying their action or preventing them from being recognized. But in some cases the action of the associated substance may be so determinate that it becomes the prominent fact, while the action of the base is obscured. This is to some extent the case with the nitrites, and very markedly so in the case of the cyanides.

The physical properties of a substance probably modify the physiological action belonging to its constituents; thus vapour density will regulate the rate of diffusion; the boiling-point, solubility and other characters will also exercise some influence in modifying the effects of a substance as a medicine.

We must also admit the probability that some medicines undergo chemical alteration within the body. Thus, for instance, hydrate of chloral is perhaps converted into chloroform by contact with weak alkaline liquids in the organism.

Again, though animals are, as a rule, affected in like manner by various substances, there are peculiarities in some animals in consequence of which the effects of certain substances are modified in particular cases. Pigeons are insensible to the influence of morphia, goats are unaffected by nicotine.

The specific action of substances is another point to be studied. Of late years it has been customary to suppose that all agents act through the blood; but we are now learning that many substances act directly upon the peripheral nerve-surfaces, the effect being transmitted by light or sound. Dr. Richardson considers that nitrite of amyl acts thus, for in an animal recently dead the heart can be influenced by its application to the surface of the retina, or to the olfactory tract. Dr. James Jones has also shown that prussic acid acts fatally by application to the medulla oblongata.

The study of this subject leads to ground so entirely new that it cannot easily be traversed, but having got a glimpse of what is to be learnt it is, as Dr. Richardson remarked, impossible to leave such ground untraversed. "Better get over it ever so little, and even in lame and shambling gait than not to venture at all. Let us once fairly get upon this new ground and we march straight to the positive science and art of cure; then the fate of quackery *intra* or *extra* the ranks, is sealed for ever. Let us not venture on the new ground, and we remain as we are—wiser than gross uncertainties but weak because, uncertain ourselves, we are constantly obliged by our questionings and admissions to proclaim to the vulgar that even the guides cannot find their way."

THE CHEMICAL REACTIONS OF CHLORAL HYDRATE.

BY J. F. BROWN.

The few simple experiments which I have here briefly noted were suggested by the letter of "F. B." in the Journal for October 8th, asking for a list of incompatibles with the above-named substance. Their results may perhaps fulfil, to some extent, his requirements.

The sample of the hydrate used was of the ordinary kind, in cakes and fragments of cakes, and yielded 70·9 per cent. of chloroform when tested by the method proposed by Mr. Umney in the 'PHARMACEUTICAL JOURNAL,' p. 107.

Chloral hydrate, when heated, fuses and boils, giving off an acid vapour.

Treated with strong nitric acid, fumes of nitric peroxide, N_2O_4, were evolved. On the addition of water and an excess of ammonia the usual reaction followed, a globule of chloroform collecting at the bottom of the tube.

Half a drachm was readily dissolved by f ʒss of pure alcohol, and no separation resulted on the addition of water. The hydrate is freely soluble in rectified spirit, and the solution mixes well with distilled water; but I remember some time since dispensing a mixture containing chloral hydrate, tincture of orange peel, and water, when on dissolving the hydrate in the tincture and adding it to the water, a separation took place of numerous oily drops, which were with difficulty diffused through the mixture. The sample used on that occasion was obtained from a well-known firm of manufacturing chemists, but was strikingly different to any that I have seen, either before or since, being in distinct transparent, needle-like crystals, very damp, but with difficulty soluble in water.

Ether dissolves the hydrate in the same proportion as alcohol, but on adding to the solution five times its volume of distilled water a very curious separation occurred. It was evident that a stratum of heavier liquid was forming at the bottom of the tube, but the mode in which this took place was to me a novel one.

Looking attentively at the column of liquid, I could perceive an *ascending* current of tolerably large globules. These, when they reached the surface, coalesced, to form a large drop suspended from it, which presently parted from its support, much as a soap-bubble would have done, and descended slowly to the bottom.

This was repeated until the liquids were completely separated, and on examining the lower stratum I found it to consist of an ethereal solution of chloral. A little exposed in a watch-glass left a residuum of dense, oily liquid, which imparted a transient greasy stain to paper.

Glycerine is a good solvent for the hydrate of chloral, and the solution mixes with water unchanged.

A solution of one part of the hydrate in six of water was mixed with different alkaline solutions of the same strength (except that of acid carbonate of sodium, which was one in twelve) with the following results:—Carbonate of potassium induced decomposition at the temperature of the atmosphere 62° F. Carbonate of sodium at 100° F. Acid carbonate of sodium, acid carbonate of potassium, and carbonate of ammonium at 212° F., and only after the disengagement of carbonic acid gas, from which it may, I think, be inferred that the reaction is due, not to the acid salts, but to the neutral compounds to which they are reduced by boiling.

With saccharated solution of lime a white precipitate of hydrate of calcium was obtained.

With tincture of perchloride of iron a precipitate of ferric hydrate.

With solution of subacetate of lead a white precipitate of hydrated oxide of the metal; and on boiling with solution of silver nitrate, oxide of silver was thrown down.

A solution of tannic acid, at a boiling heat, caused the evolution of pungent acid vapours, probably of formic acid.

The solution of the hydrate was apparently unaffected by sulphuric, acetic or gallic acids, and neither in substance nor in solution was it affected by iodine or perchloride of mercury.

May I, in conclusion, express a hope that the attention of my fellow-students will be called to this subject, that my statements may be confirmed or invalidated by further and more complete experiments.

Dover, October 21st, 1870.

JAVA CINCHONA BARK.

Some months ago several bales of cinchona bark were imported into Holland from the Dutch plantations in Java. Samples of this bark have been sent out by the Handels-Maatschappij in sealed packets with the analysis of Professor Gunning. In a recent number of the *Neues Repertorium für Pharmacie*, Herr Jobst describes this bark as consisting of larger pieces than the first samples sent over in 1867 from the English plantations in the Himalayas, although in both instances there was a want of that fine character presented by the older bark from the Andes as regards colour.

Dr. Henkel, of Tübingen, is now engaged in a microscopic examination of this bark, the results of which will shortly be published, and Herr Jobst gives the following results of his chemical examination:—

No. I. T. P. King's Bark.

Containing, according to Professor Gunning, when dried at 100° C.—

Alkaloid soluble in ether . 3·5 p. c. (much quinidine).
" insoluble " . 2·0 "

This sample consists of single and double quills from 2 to 7 inches long, from the size of a goose-quill to ½ an inch in diameter and about 1 line in thickness. The pieces are mostly of a dull brown colour, with longitudinal cracks and faintly-marked, transverse striæ, covered with warts at some parts, and pale yellow at the interior. Herr Jobst found it contained in all 3·2 per cent. of alkaloids, much of which was conchinine and cinchonine, only a trace of quinine and no quinidine, but an amorphous basic substance that has not yet been examined.

Nos. II. and III. T. P. King's Bark.

Containing, according to Professor Gunning, when dried at 100° C.—

Alkaloid soluble in ether . 2·1 p. c. (little quinidine).
" insoluble " . 1·3 "

This sample consists of fine, uniform quills of a grey colour, covered here and there with lichens. The quills were 7 inches long, from 5 to 6 lines diameter and about 1 line in thickness. The cracks and striæ were scarcely recognizable, and the colour of the bark inside was pale or dark yellow. The total amount of alkaloids was 3·5 per cent., consisting of 1·7 quinine with some quinidine, conchinine, cinchinine and amorphous basic substance.

No. IV. M.

Containing, according to Professor Gunning, when dried at 100° C.—

Alkaloid soluble in ether . . .	1·1 per cent.
„ insoluble „ . . .	0·9 „

This consisted of grey, greyish-brown and brown quills, and flat pieces about 8 inches long, with longitudinal cracks, but no transverse striæ: reddish-yellow inside. It contained in all 1·9 per cent. alkaloids, including 0·5 quinine, besides cinchonine, some quinidine, conchinine and amorphous base.

Brown Java bark.

Total amount of alkaloids 1·2 per cent., chiefly quinidine and amorphous base with trace of quinine, but neither cinchonine nor conchinine. This bark (*Pahudiana*) is already well known to be worthless, and the Dutch Government has forbidden its production.

These results show that only two of these samples (Nos. II. and III.) contain any sensible amount of the alkaloid that is alone of use,—crystallizable quinine,—and in regard to this the samples are nearly the same as a very ordinary sample of Calisaya bark. Consequently the Java bark, as produced at the present time, is quite unfit for the manufacture of quinine.—Abstract of paper in the *Neues Jahrbuch für Pharmacie*, xxxiv. 18.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Acidum Sulphuricum.—Sulphurous acid gas is procured either by burning sulphur or by roasting iron pyrites (FeS_2); it is passed, together with the vapour of nitric acid, in a stream of air into a large chamber lined with sheet lead. At intervals, jets of steam are thrown into the chamber. These materials react on each other in this way: oxygen from the nitric acid and water (of the steam) unite with sulphurous acid gas, and form sulphuric acid, which, being scarcely volatile, collects as a liquid at the bottom of the chamber. The nitric oxide (NO) which results from the deoxidation of the nitric acid combines with oxygen, which enters in the form of atmospheric air and produces nitric peroxide (NO_2); this, in turn, gives up oxygen to a second portion of sulphurous acid and itself is again reduced to nitric oxide. These changes go on in this order incessantly. On the one hand we have sulphurous acid gas and vapour of water, on the other atmospheric oxygen and, occupying an intermediate position, the nitric oxide. As the oxygen comes in it is handed over, by the intervention of the NO, into combination with the SO_2, H_2O.

O (*from the air*).	NO (*alternately* NO and NO_2).	$\left.\begin{matrix} SO_2 \\ H_2O \end{matrix}\right\}$ or H_2SO_3 *becoming* H_2SO_4.

The above reaction is accompanied by other changes. Sometimes, when water is deficient, a crystalline body forms in the lead chambers. This compound is believed to contain the elements of sulphurous anhydride, SO_2, nitric peroxide, NO_2, *plus* oxygen; but its constitution is quite unknown.

The weak acid of the lead chambers is concentrated first by evaporation, afterwards by distillation. Sulphuric acid is an oily liquid; specific gravity 1·843. It has an intense affinity for water, absorbing water greedily when exposed to the air, evolving considerable heat when mixed with water, and the mixture undergoing diminution or contraction of volume. When diluted, it gives with chloride of barium a white precipitate of sulphate of barium, insoluble in acids and in water. Sulphuric acid chars and decomposes almost all kinds of organic substances. In consequence of its attraction for water, it removes part of their hydrogen and oxygen in that form, and a mass of highly carbonaceous composition and appearance remains. Some bodies dissolve in it without blackening; indigo does this. Others do not blacken, but are completely decomposed; for example,—

$$\underset{\text{Oxalic acid.}}{C_2H_2O_4} + \underset{\text{Strong sulphuric acid.}}{H_2SO_4}$$

$$= \underset{\text{Carbonic monoxide.}}{CO} + \underset{\text{Carbonic dioxide.}}{CO_2} + \underset{\text{Hydrate of sulphuric acid.}}{\overbrace{H_2O, H_2SO_4}}$$

Nordhausen or fuming sulphuric acid is made by distilling at a strong heat partially dried sulphate of iron. The product, notwithstanding its ready decomposability, is generally looked upon as a definite compound. Some chemists still regard it, however, as a mere solution of sulphuric anhydride, SO_3, in sulphuric acid, H_2SO_4. The old name, *oil of vitriol*, arose from its being thus prepared from sulphate of iron, or green vitriol. White vitriol is sulphate of zinc; blue vitriol, sulphate of copper.

The sulphuric acid of commerce contains traces of many impurities; bisulphate of *potash* or *soda* would be left by evaporation in a platinum dish; *nitric* or *nitrous* acid, detected by a solution of sulphate of iron, which, poured over the surface, developes a purplish colour where the two liquids unite; *arsenic* or *lead*, by diluting with a considerable quantity of water, and saturating with sulphuretted hydrogen. A white cloud of sulphate of lead is usually observed on adding water to common oil of vitriol; this is derived chiefly from the pans in which the first concentration is effected; it is slightly soluble in the strong acid, but scarcely at all so when diluted, this is the cause of the precipitation.

Impure sulphuric acid may be freed from contamination with arsenic by heating it with a little hydrochloric acid; the arsenic is expelled in the form of chloride. It may be purified from nitrous compounds by distillation with a little sulphate of ammonia.

$$(NH_4)_2SO_4 + N_2O_3 = 2N_2 + 3H_2O + H_2SO_4.$$

[§ 5·06 grams, mixed with an ounce of distilled water, require for neutralization 100 c.c. of the volumetric solution of soda.] Sulphuric acid is bibasic;

one molecule of it will therefore require two molecules of hydrate of sodium for neutralization,—

$$\overset{98}{H_2SO_4} + \overset{40\times2=80}{2NaHO} = Na_2SO_4 + 2H_2O$$

or,—

$$\tfrac{1}{2}\overset{49}{H_2SO_4} + \overset{40}{NaHO} = \tfrac{1}{2}Na_2SO_4 + H_2O.$$

1000 c.c. of vol. sol., which contain 40 grams of soda, will therefore neutralize 49 grams of sulphuric acid; 100, therefore, neutralize one-tenth of 49, or 4·9 grams. 5·06 grams of the official sulphuric acid, which require 100 c.c. of volumetric soda, therefore contain this quantity of real acid. This is 96·8 per cent., for

5·06 : 100 as 4·9 : 96·8.

Acidum Sulphuricum Dilutum.—35·9 grams of the diluted acid are neutralized by the addition of 100 c.c. of vol. sol. of soda; this indicates 13·64 per cent. of H_2SO_4.

The strength of the diluted acids of the Pharmacopœia is so arranged that six fluid drachms of any of them contain sufficient acid to neutralize one molecule *in grains* of an alkaline hydrate.

f ℥vj	Contain
Acid. Hydroch. Dil.	1 grain-mol. (= 36·5 gr.) HCl
Acid. Nitric. Dil.	1 grain-mol. (= 63 gr.) HNO_3
Acid. Sulph. Dil.	$\frac{1}{2}$ grain-mol. (= 49 gr.) H_2SO_4
Acid. Phosph. Dil.	$\frac{1}{3}$ grain-mol. (= 32·6 gr.) H_3PO_4

Either of these quantities would neutralize

1 grain-molecule (= 40 gr.) of $NaHO$
or 1 grain-molecule (= 56 gr.) of KHO
or $\frac{1}{2}$ grain-molecule (= 53 gr.) of Na_2CO_3
or $\frac{1}{2}$ grain-molecule (= 69 gr.) of K_2CO_3.

PARICINE.*

BY O. HESSE.

This alkaloid was discovered by Winckler, in 1845, in a sample of bark brought from Pará, which, according to Howard, had been derived from *Cinchona lutea*, a tree which is called 'lengua de vacca' (cow's tongue) in Huanuco, by reason of the rough feel of its leaves. Weidenbusch made an analysis of the alkaloid, which showed that its percentage composition was very similar to that of aricine, and, on this ground, Gerhardt asserted that it was merely amorphous aricine.

Subsequently Winckler, in studying cortex chinæ pallidæ in 1865, took up the subject again, and compared paricine with beberine, because the latter has also the character of being precipitated from its solutions by nitric acid. Winckler found that these alkaloids had the greatest resemblance in their chemical behaviour towards the reagents he employed, and he was, therefore, of opinion that elementary analysis would prove them to be identical.

Upon this basis Flückiger assumes not only the identity of paricine and beberine,—buxin or pelosine,—but also conjectures that paricine probably exists in all kinds of cinchona bark. In order to separate it from the mixture of bases Flückiger suggests that those bases should be converted into the sparingly soluble iodine compounds, and the paricine extracted by ether.

Hesse disclaims the intention of examining whether the method is suitable for detecting paricine or not, but rather seeks to show that the alkaloid in question does not exist in the kinds of cinchona bark used for making quinine. During the last eight years he has given attention to this matter, but has not succeeded in obaining the smallest trace of paricine from those kinds of bark. In all instances the alkaloids readily soluble in ether, after separating quinine and cinchonine by means of tartaric acid, were submitted to examination by treating the sulphuric acid solution of these bases with concentrated nitric acid; but in no single instance was there any precipitation or turbidity caused thereby. If paricine had been present, however, it should have been found in this way.

The author adds, moreover, that paricine is not even identical with pelosine, since the latter, as Flückiger has observed, turns light towards the right, while pelosine is, according to De Vry, optically inactive.

* Abstract from a paper in the *Reports of the Berlin Chemical Society*, 1870, no. 5.

EXAMINATION OF THE RESIN OF TAMPICO JALAP.*

BY PROFESSOR H. SPIRGATIS.

The author has published the results of a preliminary examination of the resin contained in this drug with the object of comparing it with the resin of true jalap.†

Tampico jalap resin was obtained by first extracting the root with water, then digesting it with alcohol, evaporating off the alcohol and washing the resin with water. A second solution in alcohol and treatment with animal charcoal completed the purification. The author gives the resin the name of *Tampicin*.

This substance presents a general resemblance to convolvulin. It is translucent, colourless or slightly yellow, brittle, without odour or taste, and readily soluble in alcohol or ether. Its solubility in ether distinguishes it from convolvulin,‡ as well as from jalapin, the resin of the *Ipomœa orizabensis*. It also differs from them in composition. The alcoholic and ethereal solutions have a slight acid reaction.

By the action of streng bases this resin is, like convolvulin, converted with addition of the elements of water into an acid soluble in water,—Tampicinic acid.

Strong acids, such as hydrochloric, nitric or sulphuric acids, when diluted dissolve the resin gradually, converting it into sugar and a fatty acid—Tampicoleic acid. Concentrated sulphuric acid colours the resin yellow at first, then dissolves it with a fine red colour, which gradually becomes brown. With acetic acid this resin behaves in the same manner as convolvulin, dissolving without being broken up.

Tampicin is much more readily affected by heat than convolvulin. Its melting-point is about 130° C.

Analysis of the resin dried *in vacuo* at 100° C. gave results corresponding with the formula $C_{34}H_{54}O_{14}$; Mayer gives $C_{30}H_{50}O_{16}$ as the formula of convolvulin.

Tampicinic acid resembles convolvulinic acid, being an amorphous, yellowish, shining, translucent mass without odour, and having a rankish, bitter taste. It is hygroscopic, readily soluble in water and alcohol; the solution has an acid reaction, and expels carbonic acid from the alkaline carbonates. It is scarcely soluble in ether.

This acid is precipitated only by acetate of lead and chloride of mercury. Dried at 90° C. *in vacuo* and analysed, it gave results indicating the formula $C_{34}H_{60}O_{17}$; Mayer gives $C_{31}H_{50}O_{16} + 1\frac{1}{2}H_2O$.

Tampicoleic acid is white and crystalline, with a sharp taste, without smell, readily soluble in alcohol, sparingly in ether, both solutions having a distinct acid reaction. When heated it melts to a yellowish, oily liquid that solidifies on cooling to a hard, white, radiated mass. The

* Read before the Royal Bavarian Academy of Sciences, 2nd July, 1870.

† Kayser, Ann. Chem. Pharm. li. 81, and W. Mayer, *ibid.* lxxxiii. 121, xcv. 129.

‡ Sometimes this drug appears to be mixed with the tubercles of other Convolvulaceæ, perhaps those of true jalap. One sample of Tampico jalap yielded a resin only in part soluble in ether.

alcoholic solution expels carbonic acid from the alkaline carbonates. Analysis indicated the formula $C_{16}H_{32}O_3$. The alkaline salts of this acid are soluble in water, the ether crystallizes in rhombic tables.

Summarizing the result of this investigation, it appears that the resin of Tampico jalap resembles convolvulin in belonging to the class of conjugated sugar compounds or glucosides, while it differs from that substance by its perfect solubility in ether and in composition.

Experiments made in the Königsberg hospital to ascertain the medicinal action of Tampicin appear to show that in this respect it resembles true jalap resin, though it is less certain. Moreover, the use of this drug in the place of true jalap does not seem advisable, for although its price is only a third of what it was, the much smaller amount of resin it contains, and the large amount of alcohol required for its extraction, renders tampicin dearer than convolvulin.—Abstract from paper in the *Neues Repertorium für Pharmacie*, xix. 452.

KASHMIR MORELS.

BY M. C. COOKE, M.A.

That Truffles and Morels are found in North-Western India and Kashmir, has for years been an article of faith with mycologists, although no opportunity has occurred for satisfactorily determining the species. It is quite true that names have been applied to them, but without just cause.

Through the kindness of Dr. J. L. Stewart we have at length received from Mr. Baden Powell, of Lahore, a string of dried Morels procured by him from Kashmir. This string contains two species, both of them small, and neither of them the *Morchella esculenta* of Europe, which the Rev. M. J. Berkeley has quoted as inhabiting Kashmir. In a paper recently communicated to the Botanical Society of Edinburgh we have described these two Kashmir Morels.

In his 'Notes on the Products of Kashmir,'* Lieutenant Lowther says, "I saw fungi of all sizes and hues daily collected and devoured by old women, which in Europe would have entailed death to the eater. Either the soil of this favoured valley, or the stomachs of these hungry beldames, must be of an uncommon order. On the green slopes, which are constantly grazed on by sheep and horned cattle, I gathered quantities of superior mushrooms, and observed numerous champillons (a French dainty) in the thickets on the hills. Morels or Truffles are produced, which are dried and sold in the chief markets." This writer mentions a Morel which sells at two annas per seer, and is called "Kungutch."

Honigberger says,† "Morels are imported from the hills into Lahore, but are very little used by the natives, and the English use them not medicinally but for culinary purposes. The Morels which are brought from the Hozara country are large." From this it would appear that another species of *Morchella*, quite different from the two alluded to, is found in this region.

Dr. Royle states in his Himalayan Botany that he only obtained specimens of common Morels, or *M. esculenta*, the "Kana Kuchoo" of the natives of India, which are every year brought down for sale from Kashmir, whence some fine specimens were procured in 1831 by the plant-collectors detached from the Saharunpore Botanic Garden. The recently-published 'Handbook of Punjab Products' states that large quantities of Morels are brought down from Kashmir to Umritsur.

In his 'Punjab Plants' Dr. Stewart refers the Kashmir Morel to *M. semilibera*, and gives as vernacular names, "Kana kach," "Kangach," "Kana bichu" and "Girch hatra," and for the plains, "Khumb." He adds, "This appears to be abundant in and near Kashmir, from which considerable quantities are, after drying, exported to the plains. I have only once noticed it growing fresh at 6000 feet, near Chumba. It is much eaten by natives, both fresh and dry, and is said to be preferred by them to the mushroom. Dried, it is a not unsatisfactory addition to a stew, even for an European taste. I have no proof that a Morel which is found abundantly in the desert about Jhung, etc., and is said to be got near Hoshiarpur, etc., is the same species. It is considered a great dainty by the natives, and relished by those Europeans who have tasted it."

* *Journal of Agri.-Hort. Society of India*, viii. p. 207.

† 'Thirty-five Years in the East,' p. 323.

Dr. Henderson has remarked that "in Shahpur and other districts where there is 'Kalr' in the soil, both Morels and mushrooms are abundant; the former in August and September, the latter in the end of the cold season, after heavy falls of rain." He adds that he has seen Morels half a pound in weight and mushrooms half a foot in diameter.

This is the sum of information that we have been able to collect respecting the Morels of Northern India; from which it appears that there is still one or more large species of Morel, different from the two here recorded.

The dried Morels are perforated through the pileus, and strung upon coarse twine at about half an inch distance apart. Each fungus is from an inch to an inch and a half in length, and from a quarter to half an inch or more in diameter. Usually the short stem is broken off and the pileus alone remains. The specimens consist of the two species intermixed, of which the following are the specific characters:—

MORCHELLA DELICIOSA, *Fries.*—Pileus subcylindrical, acute, adnate at the base; ribs longitudinal, firm, connected by transverse folds; stem even, short; asci cylindrical; sporidia elliptical, one and a half diameters in length.—Fr. Sys. Myc. ii. p. 8; Krombholz, t. 16. f. 17–19. "Kana kach," "Kan gach," "Kana kuchoo" of Lahore. (Fig. 1. Spore magnified 500 diameters.)

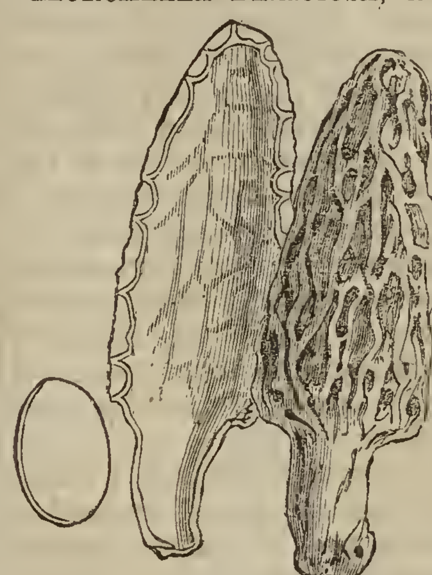

Fig. 1. *Morchella deliciosa.*

The total length of the dried specimens is an inch or an inch and a quarter, including the stem, which is about one-fourth of the entire length. It differs from *M. esculenta* in its much smaller size, different form of areolæ, longitudinal ribs and smaller sporidia, as well as other points. It is found in Java as well as Kashmir and Europe. The sporidia are ·0006 in. long by ·0004 in. broad.

MORCHELLA GIGASPORA, *Cooke.*—Pileus subcylindrical

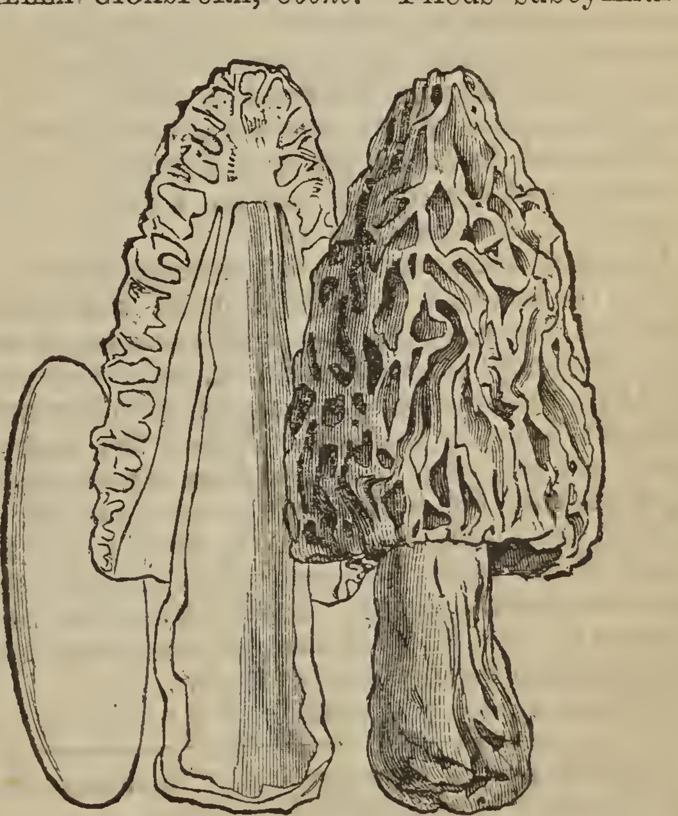

Fig. 2. *Morchella gigaspora.*

or somewhat conical, free at the base, and nearly to the top of the pileus; ribs somewhat longitudinal; connected by distant transverse folds, forming elongated, nearly linear pits; stem even, short; asci cylindrical; sporidia cylindrical, rounded at the ends, three diameters and upwards in length.—Trans. Bot. Soc. Edin. 1870. "Kana kach," "Kan gach," "Kana kuchoo" of Lahore. *M. semilibera* of Stewart's 'Punjab Plants.' (Fig. 2. Spore magnified 500 diameters.)

The total length of the dried specimens does not exceed an inch and a half. The exposed portion of the stem not more than half an inch in length, and the diameter of the pileus at the base, its broadest part, not more than three-quarters of an inch. Sporidia ·002 in. long by ·0006 in. broad.

This species is distinguished from all its congeners by the very large size of its sporidia. It is, perhaps, most closely related to *M. patula*, certainly not to *M. semilibera*. It is evidently the least common of the two Kashmerian species. What is the uncertain third or fourth species? We must wait and hope.

THE CITRATES OF THE U.S. PHARMACOPŒIA.*

BY C. LEWIS DIEHL.

The author of this paper is of opinion that almost every pharmacist who personally superintends the production of his preparations could, by noting the difficulties and phenomena which occur during the various processes, materially aid the progress of pharmacy. Many, from various causes, are prevented from doing this, and thus a great deal of valuable information is lost to the pharmaceutic world. Among the observant workers, a large class will be found who, from motives of gain, are prevented from publishing their observations; others are prevented by reason of excessive modesty, which causes them to view their experiences as a necessary result of their inexperience; and still others, who are not encumbered by this excess of modesty, are prevented by press of business or events beyond their control.

The design of the author is to draw attention to a number of preparations, most of which have come under his observation within the last twelve months. Some of them —officinals of the United States Pharmacopœia—he has found to admit of improvement, either in their general character or their methods of preparation; while for the unofficinals he has, in some cases, constructed formulæ deemed by him in accordance with the spirit of the national standard.

Citrate of Iron.—The Pharmacopœia directions for making this preparation are to take a convenient quantity of the solution of citrate of iron, evaporate it to the consistence of syrup, and spread it on glass, so that, on drying, the salt may be obtained in scales. The formula for the preparation of the solution is as follows:—

Citric acid, in coarse powder, 5 troy oz. 360 grs.
Solution of tersulphate of iron, 1 pint.
Water of ammonia,
Distilled water, each, a sufficient quantity.

Dilute the solution of tersulphate of iron with 2 pints of distilled water, add to it a slight excess of ammonia, while constantly stirring, then transfer the precipitate formed to a muslin strainer, and wash it with water till the washings are nearly tasteless. When the precipitate is drained, put half of it in a porcelain capsule on a water-bath, heated to 150°, add the citric acid, and stir the mixture until the precipitate is nearly dissolved. Then add so much of the reserved precipitate as may be necessary fully to saturate the acid. Lastly, filter the liquid and evaporate it, at a temperature not exceeding 150°, until it is reduced to the measure of a pint.

To obtain a good preparation, it is advisable to employ an excess of hydrated sesquioxide of iron. If the process is conducted in conformity with the directions of the Pharmacopœia, and the ingredients are in the condition intended, a satisfactory article may be prepared; but strict adherence to the formula is necessary to ensure uniformly a successful product. One principal difficulty exists practically in maintaining the temperature of the mixture of citric acid and hydrated sesquioxide of iron without exceeding 150° F. Constant attention to ensure this end is required, for by an elevation of the temperature above 150° F., a portion of the hydrated sesquioxide is molecularly changed and becomes insoluble, rendering it difficult to determine whether or not the solution has become completely saturated with iron. This difficulty has been overcome by precipitating about one-eighth more of hydrated sesquioxide of iron than is required by the Pharmacopœia, and adding to about three-fourths of the magma the citric acid prescribed. By occasional stirring, a clear solution is obtained, which should be gently heated by a water-bath: fractional parts of the remaining magma should then be added, until it is no longer dissolved, each portion being allowed to dissolve perfectly before adding the next.

During the evaporation of a quantity, however, it has been observed that, although the ingredients had been in proper condition and the manipulation correct, the solution became uncommonly dense before it had been reduced to the proper measure; and that on diluting it with water, a turbid mixture was produced. It was inferred that a portion of the uncombined hydrated sesquioxide of iron had been dissolved. This was apparently substantiated by the addition of a relatively small portion of citric acid, which rendered the solution quite limpid and miscible with water without the production of turbidity. The conclusion drawn is that when a warm solution of citrate of iron exercises a prolonged action upon recently precipitated hydrated sesquioxide of iron, it has the property of dissolving a portion of the hydrated base.

The preparation of scales of citrate of iron is not at all difficult, even if all the citric acid has not been saturated.

Ammonio-citrate of Iron.—In the preparation of this salt, according to the U. S. Pharmacopœia, 1 pint of the solution of citrate of iron is mixed with 6 fluid ounces of water of ammonia; the mixture is then evaporated in the same manner as the citrate of iron, care being taken that the temperature should not exceed 150°. The result should be in garnet-red translucent scales, of a slightly ferruginous taste, readily and wholly soluble in water. The solution causes no change in the colour of litmus or turmeric, and does not yield a precipitate with ferrocyanide of potassium. Solution of potassa produces with it a precipitate of sesquioxide of iron with the evolution of ammonia. To prepare it successfully, the complete saturation of the citric acid with hydrated sesquioxide is quite necessary. If this be not the case, the resulting salt is removed from the glass with difficulty, neither can it be obtained in handsome scales, being generally of a muddy colour. By reserving about one-sixteenth of the solution of citrate of iron, adding to the main bulk of the solution aqua ammoniæ until in slight excess, and then the reserved portion, a salt has been obtained which was found to be rapidly soluble in water, readily removed from the glass plates, and less prone to deliquescence than the compound completely saturated with ammonia. The direction of the Pharmacopœia to use a given measure of aqua ammoniæ is objectionable, on account of the variable strength of that article as found in the shops, or obtained from the manufacturer; for while it is a simple matter for the skilled operator to determine its strength expeditiously, it requires more time than pharmacists not skilled or prepared for these determinations are willing to devote to it.

(*To be continued.*)

* Abstract from a paper entitled "Pharmaceutic Items," in the *Chicago Pharmacist* for September.

Poisoning by Yew Berries.—A case of poisoning by yew berries (*Taxus baccata*) is reported in the *Medical Times and Gazette*. In the afternoon of the 24th of September a patient was found dead in the ward of the Sussex County Asylum. In the morning he had eaten a hearty lunch and returned to work; at dinner he complained of pain in the epigastrium, and vomited part of his food. As he was a very greedy man, eating all he could get hold of, this was not considered remarkable. At five o'clock, when the attendant went to rouse him to bathe, he was sitting in a chair quite dead. Suspicion of poison was awakened by the presence of yew berries in a motion passed into his clothes. Upon inquiry it was found that he had eaten some about ten o'clock. Upon a *post-mortem* examination berries were found in the intestines. The medical gentleman who reports the case asserts that poisoning by yew berries is a very rare occurrence, many persons being able to eat them with impunity. He suggests that it would be interesting to know to what extent these berries are really poisonous, and, if the narcotico-acrid properties reside solely in the stones, whether the active principles might not be separated and employed in medicine in the place of more expensive drugs.

The *Suffolk Chronicle* of Tuesday last reports what may prove to be another case of poisoning by yew berries, which has occurred at Sudbury. Five children, after playing in the cemetery with some berries, went home ill, complaining of headache and sickness. One of them, five years old, died the next day. Some berries were found, which proved to belong to the wild Guelder-rose. The only other berries in the cemetery were those of the yew. The children all deny having eaten any; but one of them says that the deceased was playing with a berry, which she squeezed, causing the juice to squirt into her eye and mouth, and making her cry because of the smart. No seeds were detected in the excreta. The inquest was adjourned, that a *post-mortem* examination might be made.

Death through an Overdose of Chlorodyne.—An inquest was held in Liverpool, on Tuesday last, upon the body of Mr. Glover, a cotton-broker. Evidence was given that on the previous Thursday the deceased purchased five drams of chlorodyne from Mr. Buxton, chemist, 78, Kensington. The bottle containing it was labelled, and the dose was stated on the label to be ten drops. He told the chemist he was in the habit of taking half a spoonful. He afterwards purchased half an ounce of laudanum and two ounces of castor oil from another chemist. The next morning the servant, finding that she could not rouse him, sent for medical assistance. Dr. Prichard and Dr. Parker attended, but except for a few minutes, when he said that he did not intend to take so much, the patient did not recover consciousness, and he died the same evening. The laudanum and castor oil he had purchased were not found. Only about one dram and a half of the chlorodyne remained. The jury returned an open verdict, expressing an opinion that the deceased had taken an overdose of chlorodyne.—*Liverpool Mercury.*

Poisoning by Croton Oil.—At Sydney, a child thirteen months old, has been poisoned by a liniment containing 1 drachm of croton oil to 15 of soap liniment. It is estimated that the dose was two minims and a half, which proved fatal in six hours. The child's father, who administered it, could neither read nor write.—*Medical Times and Gazette.*

Poisoning by Oil of Vitriol.—On Saturday, October 1, an inquiry was instituted relative to the death of Mr. Robert Chambers, an oilman, residing in Hunter Street, Brunswick Square. Evidence was given that the deceased was a highly nervous man, and had lately been under the delusion that he was liable to be hanged for an accident which had happened in his shop. On the previous Thursday he drew off a quantity of oil of vitriol from a carboy in the shop, and, after saying that the police should not hang him, drank about a gill of it. The jury returned a verdict of "Suicide while in an unsound state of mind."

Death from Chloroform in Japan.—Considerable sensation has been created at Yokohama in consequence of a death following the administration of chloroform. After a protracted inquiry a coroner's jury returned a verdict of "Death from the effect of chloroform administered without proper degree of care." The surgeon who administered the chloroform (Dr. Dalliston) has, in consequence, been committed for trial, but liberated on bail in the sum of 5000 dollars. Public attention in Japan and China has been called to this case by Dr. Edward Henderson, Municipal Medical Officer and Health Officer at Shanghai, who criticizes the various statements made by the witnesses in a masterly manner. —*Medical Times and Gazette.*

Statue to the late Professor Graham, F.R.S.—It has been decided by the friends and admirers of the late Professor Graham to erect a statue of him at Glasgow. Leave has been asked and obtained from the Town Council for placing it at the south-east corner of George Square. The sculptor is Mr. William Brodie, of Edinburgh. The pedestal will be of Aberdeen granite, and the figure of bronze, corresponding with the figure of Watt at the south-west corner.

New Sulphur Deposit.—A new source of supply of sulphur is announced in the *New York Times*. It is in the island of Saba, one of the Dutch West Indies, situated about 110 miles south-east from St. Thomas and 40 miles south-west from St. Martha. The island is of volcanic origin, about 11 miles in circumference, and at its highest point about 2800 feet above the sea-level. Though a Dutch possession, the language spoken by its 2000 inhabitants is chiefly English. The sulphur deposit was discovered by a person from New York, who, noticing indications of sulphur-ore, quarried, with the help of the natives, two sloop loads, which he took to New York, and submitted for analysis. The report of the chemists was to the effect that while the Sicily ores yield only about 30 per cent. of brimstone for the ore consumed, the Saba ore yields an average of over 60 per cent. Adding to this the fact that the island is only about 1500 miles from New York, it will be seen that this is an important discovery, and it will not be wondered at that steps have been taken to secure leases of the best tracts on the island.

Scarlet Fever.—Dr. Renfrew, of Glasgow, recommends that in scarlet fever a medicine consisting of a mixture of tincture of steel and chlorate of potash. This mixture, he says, contains chlorine, which destroys the poison; muriatic acid, which supplies an acid wanted in the blood; iron, to improve the impaired red disks and to assist in forming new ones; and chlorate of potash to supply oxygen, to oxidize the disintegrated matters floating in the blood.

Permanganate of Potash.—Dr. H. S. Thorne, of Chicago, reports* that he has treated oxaluria and dyspepsia successfully with grain-doses of permanganate of potash made with bread into pills, three of which were to be taken daily for ten days. On examination of the urine after a few days not a crystal of oxalate of lime could be seen. Dr. Rose, of Michigan University, had previously prescribed it in the following form:—

℞. Permanganate of Potash gr. viij
Water ℥ij.

M. sig. One teaspoonful to be given three times a day.

It should not be given except on an empty stomach, as it is decomposed in contact with organic matter, yielding its oxygen to any substance, simple or compound, that will receive it.—*Druggists' Circular.*

* *Michigan University Medical Journal.*

CONVENTION OF DELEGATES FROM COLLEGES OF PHARMACY.

In compliance with a request of the Maryland College of Pharmacy, a meeting of delegates from the various colleges was held on the evenings of September 14th and 15th, at the Hall of the Maryland College of Pharmacy.

The object was to confer upon the subject of pharmaceutical education, and a uniform standard for the graduations of students.

Joseph Roberts and Prof. J. Faris Moore, both of Baltimore, were duly elected President and Secretary. Delegates were in attendance from the Maryland, New York, Philadelphia, Massachusetts and Chicago Colleges, also from the California Pharmaceutical Association and New Jersey Pharmaceutical Association.

The following recommendatory resolutions were adopted:—

1. That, in the opinion of this meeting, more attention to the preliminary education of those who propose to enter the business of pharmaceutists is needed, and it is earnestly recommended to the colleges and societies of pharmacy to urge their members and the profession generally to give greater care to this subject in taking apprentices.
2. That a term of four years' service in a dispensing drug store be recommended to be exacted from students in pharmacy before coming up for examination.
3. Apprentices not to be taken under sixteen years of age, and shall be twenty-one years of age before being entitled to receive their diplomas.
4. The branches to be taught in colleges of pharmacy should at least include lectures on general chemistry, elementary botany, materia medica, and the general facts and principles of pharmacy; and, when practicable, opportunity should be provided for general and analytical chemistry.
5. Whatever method of examination be adopted should include questions both oral and written, and that particularly a familiarity with the physical properties of specimens should be insisted on.
6. Diplomas should not be recognized as evidence of qualification, unless based on four years' service in a dispensing shop.
7. Each college of pharmacy is requested to take action on these resolutions, and report next year.

This organization of delegates was, on vote, made permanent, and it is to meet annually, at the same time and place as the American Pharmaceutical Association.

The meeting then adjourned.

IRISH SCIENTIFIC SOCIETIES.

As the time draws nigh for the *savoir-faire* of the scientific world, it may not be uninteresting to give a list of the principal scientific bodies in Ireland, most of which are comparatively unknown in England, although of considerable importance as publishing Societies. The oldest, most important, and best known is the Royal Irish Academy, the members of which luxuriate in the letters M.R.I.A. after their names. This Society has for the last few years been rather monopolized by the archæologist. That important branch of the Academy has perhaps received an undue development, to the detriment of pure science, from the beautiful archæological museum and antiquarian library which it possesses. The appointment of the last President, Professor Jellett, whose researches in connection with polarized light are well known, has tended, however, to neutralize this propensity. The Academy has the distribution of a Government grant of £200 per annum, in aid of original research, which it distributes in the most careful and conscientious spirit. The Academy is devoted to pure science; technical papers are not received. It publishes both "Transactions" and "Proceedings." The Royal Dublin Society is taken up chiefly with applied science. It gives annually a series of popular lectures, similar in character to those given by the Royal Institution. The Society receives considerable aid from Government, and it has charge of the fine botanic gardens, natural history museum, agricultural museum, and national gallery of art. The curator of the minerals is Dr. Emerson Reynolds, a chemist of considerable standing. This Society has also a very fine library, and publishes its "Proceedings."

The "Royal Geological Society of Ireland" is also a chartered Society, and it also publishes its proceedings.

The Zoological Society possess a fine collection of animals at their gardens in the Phœnix Park.

The other Societies (non-publishing) are the Natural History Society, and the "Chemical," "Scientific," and "Microscopic" Clubs. The last-named publishes its minutes, however, in one of the journals of microscopic science. It records the work done by some of our best microscopists, viz. William Archer, Dr. Percival Wright, Eugean O'Meara, etc.

Amount of Active Substance in Conium maculatum.—In an address recently delivered by Professor von Schroff to the Society of Physicians in Vienna, he stated that his experiments have led him to the following conclusions:—

1. The unripe fruit of one-year conium plants contains the smallest amount of conia.
2. The unripe fruit of the two-year plants contains most conia, especially when the development of the fruit is advanced and it is near ripening.
3. The perfectly ripe fruit, which is produced only by the two-years plant, stands in regard to its efficacy between those mentioned above.—*Wochenblattes der K. K. Gesellschaft der Aerzte in Wien*, 1870, no. 1.

Test for Butyric Acid in Glycerine.—Perutz states that when glycerine is gently heated with alcohol and sulphuric acid, butyric ether is formed if the glycerine contains butyric acid, and it may be recognized by its characteristic odour.—*Journ. Chim. Méd.*

Syrup of Ipecacuanha.—The following formula is sent to the *Chicago Pharmacist* by Mr. L. E. Sale, of Huntsville, Alabama, who says that it will give a good syrup of ipecacuanha, which will keep without deterioration:—

R. Fluid Extract of Ipecac. (U. S. P.) f ℥xvijss
Granulated Sugar ℥xxxij
Water f xvj.

Pour the fluid extract of ipecacuanha on the sugar in a shallow evaporating vessel, and set aside in a warm place to dry; when dry add the water, dissolve the sugar with aid of gentle heat and strain.

Application for Ringworm.—Spirit of turpentine brushed over the surface has been recommended as a cure for the common ringworm.—*New York Druggists' Circular.*

Palatable Hydrate of Chloral.—Hydrate of chloral ℈ss; chloroform water ʒij; syrup of oranges or tolu ʒi–ij; tincture of ginger 6 to 12 drops; water to $1\frac{1}{2}$ oz. The chloroform water is prepared by dissolving half a fluid ounce of chloroform in a gallon of water. This seems to intensify the action of the chloral hydrate, and covers the acrid taste.—*Richmond amd Louisville Medical Journal.*

Delicate Colour-Test for the Detection of Strychnia.—Mr. T. Wenzell, of San Francisco, states that in experimenting for the discovery of the presence of minute portions of this alkaloid, he has found that a solution of 1 grain of permanganate of potash in 2000 grains of sulphuric acid, to be the best test for the purpose. In delicacy of reaction, brilliancy and duration of colours, it is greatly superior to the bichromate of potassa and sulphuric acid test.—*American Journal of Pharmacy.*

The Pharmaceutical Journal.

SATURDAY, OCTOBER 29, 1870.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes to be endorsed "Pharm. Journ."*

THE EFFECTS OF DRUGS.

For some thousands of years the question, How medicine cures disease? has rather afforded scope for the exercise of fancy than it has admitted of being considered by the aid of precise observation and direct experiment. Even at the present day we have scarcely any acquaintance with the rational connection doubtless existing between the individual nature of a medicinal agent and those physiological effects which we know it produces. Our knowledge in this respect is almost entirely empirical, and it is only of late years that some glimmer of light has been thrown upon this obscure though important subject. Dr. B. W. Richardson, one of the foremost pioneers in this field, has for some years devoted his attention to studying the physiological action of various definite substances, and he has already obtained results of great interest, which he makes known in occasional courses of lectures. On another page we give some account of an introduction to such a course. It may be asked by some acutely practical people, What has this to do with Pharmacy? Is it not rather mere scientific speculation? We do not think so, and with all regard for the practical requirements of trade, we believe that subjects such as those discussed by Dr. Richardson ought to receive the careful consideration of pharmacists.

We believe also that their exposition rightly finds a place in this Journal, inasmuch as it is the official organ of the body which is charged with the duty of raising the standard of pharmaceutical competence. For that reason it should be a leader of opinion as well as of practice, and since the art of healing is so capable of expansion, its handmaiden pharmacy should not refuse to look beyond the narrow boundaries of the present, nor confine her attention solely to the range of past experience.

A few months ago Chloral was a substance altogether outside the pale of pharmacy; the mention of it in a pharmaceutical journal might have been censured as unpractical; but since then it has become perhaps one of the most important items of the materia medica. Who can say which of the substances now known only to theoretical chemistry, may be the next to take place with opium and bark and calomel as a daily necessity for the physician, as a material to be used hourly by the pharmacist?

The question as to whether quinine exists in plants other than the *Cinchonæ* has often been raised, and it has just received another answer in the negative. The bark of the *Hymenodictyon excelsum*, a large forest tree, has long been in repute in India as a valuable native febrifuge, its properties being due, it was thought, to the presence of quinine. It was, moreover, formerly considered one of the *Cinchonæ*, and known under the name of *C. excelsa*. Mr. Broughton, the Government Quinologist at the Ootakamund Plantations, has recently examined the fresh bark of this tree, and finds that the bitter taste is owing to the presence of *æsculin*, the principle found also in the bark of the horse-chestnut-tree. The bark when dry becomes almost tasteless, owing to the *æsculin* coming in contact with decaying organic matter, and being changed into *æsculetin*. Curiously enough, both these barks, which contain *æsculin*, have been recommended for the same purpose. As, however, *æsculin* is much dearer, less plentiful, and less efficacious than quinine, it is not likely to come into use in India. We may also mention that a very interesting tree (the bark of which is also said to contain quinine) grows in Central Africa, forming large forests; it is used largely by the natives in cases of fever. Dr. Welwitsch, who discovered, and figured it in his 'Sertum Angolense,' under the name of *Corinanthe paniculata*, is endeavouring to obtain a supply of the bark for chemical analysis and trial. The tree is remarkably cinchonaceous in habit.

It appears from a recent article by Dr. Pott in the *Zeitschrift für die Gesammten Naturwissenschaften* that extracts of flesh and fish have been prepared in Java and Sumatra for several centuries. The raw material, after being boiled and comminuted, is placed in a press, the expressed juice being exposed to a moderate heat till it assumes the consistence of syrup. The extracts so prepared all possess an intensely saline taste, arising from the accumulation of organic salts caused by their great concentration. Upon analysis they were found to contain mere traces of gelatine and to give no indication of albumen. One sample contained 20·9 water, 16·4 ash. The dry extract contained 9·54 nitrogen.

CHEMISTS AND DRUGGISTS' FUND ON BEHALF OF THE SICK AND WOUNDED IN THE PRESENT WAR.

Since the publication of the last list of subscribers some further contributions have been received. We propose closing the Fund on the 30th November next, and shall then give a final list.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

October 19*th*, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

Twenty-eight Candidates were examined,—four Major and twenty-four Minor; the following passed:—

MAJOR (registered as Pharmaceutical Chemists).

*Butterworth, Albert ....Sowerby.
Strickland, George Hodgson ..Darlington.
Barrett, Frederick John ......Fakenham.
Joule, John Samuel ....Buxton.

MINOR (registered as Chemists and Druggists).

*Ward, Edwin ....Cheltenham.
*Marshall, Eli................London.
*Newman, Arthur Joshua ....High Wycombe.
*Wright, Joseph ....Knutsford.
*Nicholson, Edward ....Manchester.
Chandler, John..............Nottingham.
Thomas, John Darby Dermott. Clifton.
Foster, Henry Pibworth......Portsmouth.
Udale, Daniel ....Congleton.
Robinson, Joseph ....Chester-le-Street.
Thomas, Thomas Rees........Llandovery.
Darby, Samuel Aldred........Reading.
Bradford, Cordley ....Spalding.
Salmon, Thomas ....Pontypool.
Little, Arthur Nicholas ......Bristol.
Eden, Thomas ....Dublin.
Marshall, Austen ....Stratford-on-Avon.
Springall, John Barcham ....Norwich.
Part, Edward James ....Dover.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

The Certificate of Examination of the undermentioned by the University of Cambridge was accepted in lieu of the Preliminary Examination.

Folkard, Montague ....Colchester.

October 20*th*, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Gale, Garle, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

Eighteen Candidates were examined; the following passed:—

MINOR (registered as Chemists and Druggists).

*Lyddon, Richard ....London.
*Sweetman, Robert ....Warwick.
*Roberts, Joseph Elliott ......Leeds.
*Hardy, Robert ....Boston.
Loveless, Edward William....Bath.
Elliott, Thomas ....Clay Cross.
Melhuish, Thomas Boucher ..London.
Francis, George Bult ....Diss.
Walker, John Sydenham ....Manchester.
Slater, Jonathan ....Keswick.
Rieveley, Charles ....Birkenhead.
Grinstead, John ....Chichester.
Goodman, Daniel Henry......Bath.

The above names are arranged in order of merit.

* Passed with honours.

FIRST, OR PRELIMINARY EXAMINATION.

The Certificate of Examination of the undermentioned by the Incorporated Law Society was accepted in lieu of the Preliminary Examination.

Riley, Charles Reynolds ......South Lambeth.

FIRST OR PRELIMINARY EXAMINATION.

October 3*rd*, 1870.

The following is a list of towns in which Examinations were held, with the number of candidates annexed:—

(Omitted last week.)

Aberdeen	18	Lymington	1
Abingdon	1	Manchester	11
Ashton-under-Lyne	3	Newcastle-on-Tyne	4
Banbury	2	Newcastle-un.-Lyme	1
Barnstaple	4	Newport (I. of W.)	1
Berwick	1	Newport (Mon.)	1
Birmingham	4	Northampton	4
Blackburn	1	Norwich	5
Boston	1	Nottingham	1
Bradford	1	Peterborough	1
Brighton	1	Preston	4
Bristol	8	Plymouth	2
Buckingham	1	Portsmouth	2
Bury St. Edmund's	1	Ripon	1
Cambridge	2	Rochdale	2
Cardigan	2	Rochester	1
Chesterfield	1	Ryde	1
Cockermouth	1	Sanquhar	1
Colchester	2	Scarborough	1
Darlington	1	Shaftesbury	1
Devizes	1	Sheffield	3
Diss	1	Shrewsbury	1
Doncaster	3	Southport	1
Dover	2	South Shields	1
Dudley	2	Stafford	2
Exeter	1	Stockport	2
Glasgow	1	Stourbridge	1
Grantham	1	Swansea	1
Guildford	1	St. Alban's	1
Halifax	3	Taunton	1
Hartlepool	1	Tenterden	2
Hastings	1	Tewkesbury	1
Hereford	3	Thirsk	2
Horncastle	2	Torquay	1
Huddersfield	2	Tunbridge Wells	2
Hull	2	Ulverstone	2
Ipswich	2	Wakefield	2
Leamington	1	Walsall	1
Leeds	10	Warrington	1
Leicester	3	Whitehaven	3
Leighton Buzzard	2	Wigan	1
Lewes	1	Winchester	2
Lincoln	2	Yarmouth, Great	2
Liverpool	7	York	3

ERRATUM.—Page 328, col. 2, line 6 from bottom,
for Davez, Thomas Sercombe.
read Davey, Thomas Sercombe.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The following programme of classes to be held in connection with the school of pharmacy of this Association during the session 1870–71 has been issued.

Chemistry.—A course of lectures will be delivered by Edward Davies, F.C.S., Lecturer on Experimental Physics in Queen's College, on inorganic and organic chemistry, preparation of chemical products used in pharmacy, qualitative and volumetric analysis. Each lecture will be followed by questioning upon the previous lecture, and illustrated with experiments. The course will commence on Friday, November 4th, from 8 to 9.30 P.M., and will be continued weekly until the end of April at the laboratory, 17, Back Colquitt Street. Fee for the course, one guinea. Pharmaceutical students will be received at the laboratory for the study of practical chemistry at any hour between 9 and 5 o'clock. Fee, one guinea and a half for three months, two hours per week.

Materia Medica.—A course of lectures will be delivered by W. Carter, M.B., B.Sc., F.R.C.S.I., Lecturer on Botany and Zoology in Queen's College, having special reference to the requirements of the examinations under the Pharmacy Act, and will be illustrated by specimens from the museum. The course will include the recognition of drugs, properties of drugs, adulterations of drugs, plants and animals yielding medicinal substances, etc. The lectures will be delivered in the Museum, Royal Institution, on Tuesday evenings, at 8.15, from November 1 to the end of March, 1871. Fee, one guinea.

Botany.—This course, by Dr. Carter, will include (1) Structural and Physiological Botany—cells and vessels, roots, stems, leaves, flowers and fruit, functions of the organs of vegetation and reproduction; (2) Systematic Botany and Demonstrations on Plants—general classification, Linnean and natural systems, distinctive characters of the British Natural Orders. Attention will be paid to the recognition of plants by dried and fresh specimens and plates. The class will be held on Tuesday evenings, at 8.15, from April 4th until the end of July, 1871. Fee, one guinea.

Further particulars may be obtained at the School of Pharmacy, 17, Back Colquitt Street, or of Mr. Edward Davies, Hon. Sec.

THE LINCOLN CHEMISTS' ASSOCIATION.

The First Meeting of the Lincoln Chemists' Association for the session 1870–71 was held on Tuesday, October 18th. Nearly all the members were present, and the following officers were elected:—*President:* Mr. W. Harrison. *Vice-President:* Mr. C. Clayton. *Hon. Secretary:* Mr. C. F. Gadd. *Councillors:* Mr. F. Mack, Mr. J. Wingate, Mr. W. Cox.

Several new members were elected, the accounts audited, and the funds were found to be in a prosperous condition.

This Association has sent several members to Bloomsbury Square for the different examinations, and it is to be hoped that its sphere of usefulness may greatly extend.

HULL CHEMISTS' ASSOCIATION.

The Second Annual Meeting of this Association took place at the Cross Keys Hotel, on Tuesday, October 18th, to pass the accounts and elect officers for the ensuing year. Mr. Baynes was re-elected President, Mr. A. Smith Vice-President, and Mr. Bell, Secretary.

Through the able management and liberality in time and money of these gentlemen, supported by an active Committee, this Association was, during the session 1869–70, not only self-supporting, but enabled to provide interesting and instructive lectures on botany, pharmacy and materia medica to a good number of the apprentices of Hull. The lecturers give a very satisfactory report of the attention, good conduct and intelligence of their pupils.

It is hoped that, in future, all the chemists in Hull, and especially those who have apprentices, will take more interest in this movement by attending regularly the monthly meetings, and inducing the youths under their care to attend the lectures.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Wednesday, September 14th.

The Conference reassembled at 2 P.M.

The PRESIDENT said it gave him great pleasure to introduce to the meeting one of their oldest members, who had often contributed valuable papers to their Proceedings, but who resided at so great a distance that they had not had his personal presence before. He alluded to Mr. Tichborne, Chemist to the Apothecaries' Hall of Ireland, who had come from Dublin to attend the meeting.

ON SULPHITE OF ZINC.

BY CHARLES R. C. TICHBORNE, F.C.S., M.R.I.A.,
Chemist to the Apothecaries' Hall, Ireland, etc.

The interest that attaches to the sulphites from a pharmaceutical point of view is increasing every day, and the following notice of the chemical and general properties of one of them will, I have no doubt, be of use. The sulphites are gradually creeping into favour with the medical profession. No doubt this is due more or less to the development of the germ theories and kindred views, for as regards the antiseptic properties of the sulphites there are no two opinions. The antiseptic power of the anhydride is perpetuated through all its salts, more or less modified by its solubility or decomposibility.

Having had occasion to prepare the sulphite of zinc, I was impressed with an opinion that it was one of those compounds that bid fair to become practically useful, and was therefore worthy of careful investigation.

Preparation.—Zinc being bivalent, 6 ounces of sulphate of zinc and $5\frac{1}{4}$ ounces of sulphite of sodium were dissolved respectively in 6 and 10 ounces of distilled water, and poured together whilst hot. If necessary, the solutions should be filtered before mixing. The quantities are calculated after the following equation:—

$$Zn''SO_4;\ 7H_2O + Na_2SO_3;\ 7H_2O$$
$$= Zn''SO_3 + Na_2SO_4 + 14H_2O.$$

The salt is, as will be seen further on, practically insoluble, and this method of preparation is much better than dissolving carbonate of zinc in sulphurous acid. The salt does not immediately form whilst the mixed solutions are hot, but as they slowly cool it is deposited in needle-like prisms; these crystals are, when once formed, extremely insoluble in hot or cold water. As regards its purification, the mode simply consists in well stirring during the cooling, so as to get microscopic crystals. These are thrown upon a filter, and well washed with distilled water as long as the washings give any decided precipitate with chloride of barium in the presence of hydrochloric acid. The washing, however, always gives a minute precipitate, but the sulphate will not practically amount to an impurity of any importance, and it is this reaction that has evidently given the idea of a constant oxidation going on which is unlimited as regards its extent. The salt, when properly washed, is dried at 100° C. The yield is about 43.

Composition.—The following formulæ have been given by different authorities as the composition of this salt:—

Fordos and others, $ZnSO_3 2H_2O$.
Rammelsberg, $2(ZnSO_3)5H_2O$.

There was evidently some discrepancy here, and it was therefore considered necessary to determine the actual composition.

The sulphite was finely powdered and dried at 100° C. 1·237 gramme of the salt so prepared required 2090 grain-measures of the B. P. volumetric solution of iodine to colour the solution blue, mucilage of starch and a few drops of acid having been previously added. This gave

35·01 per cent. of anhydride as being present. Now, theory requires for 2 molecules of water 35·35 per cent., therefore this is rather low, which is no doubt due to a trace of sulphate of zinc.

Air-dried sulphite, however, only consumed 2985 grain-measures of the decinormal solution, the weight taken being 1·918, which corresponds with the terhydrated salt. Thus, theory $Zn''SO_3; 3H_2O$ would give 32·16 anhydride, practice gives 32·39. Sulphite which had been finely powdered, and submitted to the prolonged action of sulphuric acid under a bell-glass, gave a similar result. We therefore see that the discrepancy observed in different authorities is easily accounted for; the composition of the salt varies according to the method by which it is dried. It is as follows:—

Dried in the air, or over sulphuric acid, $Zn''SO_3; 3H_2O$.
Dried at 100° C. . . . . $Zn''SO_3; 2H_2O$.

M. Fordos' formula is correct as long as the salt is dried at 100° C., but not unless this is the case; whilst Rammelsberg had evidently been operating upon a salt one molecule of water in which had been partially dissociated by heat. The terhydrated salt may be viewed as the normal compound, as it seems perfectly stable under ordinary circumstances.

General Properties and Stability.—Sulphite of zinc is very insoluble in water at the ordinary temperature. 500 grains of a saturated solution consumed 82·5 measures of the iodine solution, which represented ·164 per cent. of the hydrated salt. It crystallizes in semitransparent prismatic crystals, which are pellucid on recrystallization from sulphurous acid. It decolorizes a solution of iodine without being acidulated. One extraordinary property of the sulphite of zinc is its ready solubility in an excess of sulphurous acid. If washed, sulphurous anhydride is passed for some considerable time through 1 part of the salt suspended in about 3½ parts of water. A solution is readily obtained containing about 20 per cent. of sulphite, and having a specific gravity sometimes as high as 1·240 to 1·245 at 15° C. 15 per cent. easily dissolves in the ordinary sulphurous acid of the Pharmacopœia.

When dry, neither the di- nor tri-hydrate suffers oxidation on exposure to the air. They are, contrary to what is stated in the books, perfectly stable salts; however, like most of the sulphites when in solution, they suffer a gradual but slow oxidation; and thus its antiseptic power. Thus a saturated solution of the sulphite when tested with the volumetric solution gave the following results,—in each experiment 500 grains were taken:—

Day of the Month.	Grain Measures of Vol. Solution.
8th	82·5
9th	66·
10th	50·
11th	25·
12th	10·

On the 15th the sulphurous acid had become converted into sulphuric. The saturated acid solution was diluted with water, and tried in a similar manner. The oxidation was not nearly so rapid, and at the expiration of fifteen days it had not lost ten per cent. of its strength. The *saturated* acid solution suffers very little change.

Uses in Pharmacy.—The composition of sulphite of zinc would naturally point to its therapeutic uses. It might be viewed as a desiccant, antiseptic, astringent and caustic (we are now speaking of its external applications). As regards the last its insolubility renders it so mild that it could be hardly considered under the head of a caustic at all, and more nearly approaches the desiccant, oxide of zinc, in this respect. Its antiseptic properties, like all the readily oxidizable sulphites, are well marked; nor is it, indeed, necessary for it to come in contact with acid secretions for its power, in this respect, to come into play. It has been tried in some of the hospitals, and well spoken of in many cases.*

The following formulæ may be suggested:—

Sulphite of Zinc Lotion.

Take of
Finely powdered sulphite of zinc 20 grains.
Distilled water ℥xx.

Digest twenty-four hours, occasionally shaking, and then decant the clear solution for use. This lotion should be made as required.

This lotion will contain about ½ grain to the fluid ounce, and might be advantageously used as a cold-water dressing for wounds.

Acid Sulphite of Zinc Lotion.

Take of
Powdered sulphite of zinc 8 grains.
Sulphurous acid B. P. ʒi fluid.
Mix, and when dissolved add
Distilled water ℥i ʒvij.

Sulphite of Zinc Ointment.

Take of
Prepared lard ʒvij.
Powdered sulphite of zinc dried at 100° C } ʒi.

Compound Sulphite of Zinc Ointment.

Take of
Lard ℥iiiss.
Oxide of zinc ʒiij.
Sulphite of zinc ʒi.

The above ointment has been found most useful as a mild desiccant and antiseptic ointment in skin diseases.

The President said the sulphites were coming into very general use, especially the lime, potash and soda sulphites; and that one large mode of consumption was for brewing purposes, for making weak beers keep from turning sour in summer weather.

Mr. Cottrill (Shepton Mallet) said that in Somersetshire the use of bisulphite of lime for cider was very extensive.

Mr. Tichborne stated that bisulphite of lime was much used in the porter breweries of Dublin, and its preservative effect was undoubted. However, it was open to the objection that some of the nitrogenous compounds of the porter united with the liberated sulphur, and when this porter was bottled a fetid gas was developed. This difficulty did not exist in the case of ale.

Professor Attfield remarked that the discussion of the paper by Mr. Tichborne had somewhat drifted into one of its bearings only, but beyond this they must recognize that the paper represented a large amount of able and laborious work, for which they were greatly indebted to the author.

The Flax Lints of Commerce under the Microscope.

BY THOMAS GREENISH, F.R.M.S.

The introduction of machine-made lint, which dates from about 1847, has to a very great extent superseded

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* A medical friend, of considerable hospital experience, writes as follows:—"A lotion of the sulphite of zinc proved highly beneficial in a case of gonorrhœa, rapidly lessening the discharge, and causing but slight pain. From the rapidity of the change in the character of the discharge after each injection, it would appear as though it acted not only as an astringent, but also as an antiseptic, causing decomposition in the pus, with which it came in contact; and subsequently in its chronic stage an injection, formed of 1 grain of sulphite to the ℥i, held in solution by a sufficient quantity of sulphurous acid, caused a complete cure, without pain or inconvenience. It requires further experience before pronouncing definitely on its merits; but there is sufficient evidence of its usefulness to warrant extensive trial in other cases. It would, no doubt, make an excellent collyrium (without the acid) in purulent ophthalmia, and a stronger solution might be used in ulceration of the mouth and gums. The solution of 2 grains to ℥i of the acid solution was tried with excellent results to lessen the fetor in a case of extreme suppuration from a burn. In skin diseases, especially those of a parasitic origin, sulphite of zinc would probably prove invaluable."

that made by hand. The latter had many defects, and the former possesses many advantages. Machinery, by lowering the price of lint, has very much increased its consumption; but there still lingers in the minds of many persons the feeling that there is no lint like that made by hand, and also a suspicion that the so-called "flax-lints" contain a mixture of cotton, varying in the samples of different makers, but objectionable in all.

Just at the time when I was engaged on this subject a circumstance occurred which will serve to illustrate my remarks. A medical man called on me for some lint. I unrolled a packet of Taylor's Super A 1 flax lint. He objected to it, remarking that it was mixed with cotton, and also that the presence of cotton in lint detracted from the value of the lint as a dressing for sores; and this was especially the case when applied to a blistered surface. Now here was a question of fact and also one of opinion; and to determine one at least of these—the presence of cotton, or otherwise, in samples of professedly flax lint—was the object I had in view, and I have thought that the subject possessed sufficient interest to justify me in bringing the results under your notice.

A difficulty met me at the outset. I had purposely discarded all "*cotton lints,*"—they did not come within the scope of my inquiry; and to examine every sample even of those labelled "flax lints," whether from wholesale houses or retail establishments, would occupy more than the limited time at my disposal, and be of no practical value, for the absence of the maker's name left no means of identification. Here, for instance, is a sample of lint. The packet had a very pretentious label —"Superfine Lint," etc. It does not profess to be flax, nor does it say that it is cotton, neither has it the maker's name. Its composition is about half cotton and half flax, and the same remark will apply to the linted surface. I have examined a good many samples labelled flax lints, from different sources, but shall illustrate this paper by reference to those of a few well-known makers.

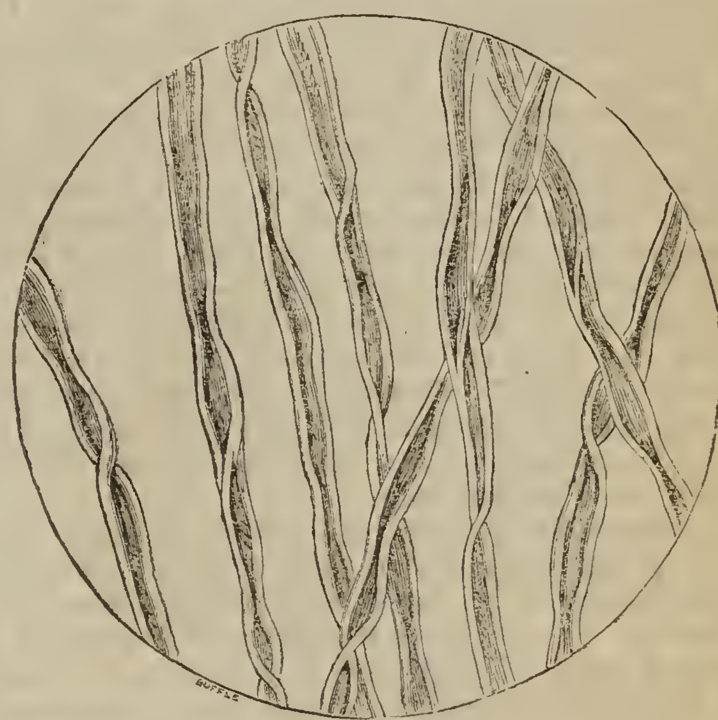
No. 1 Sample.—I will commence with the lint to which objection was made, Taylor's Super A 1 Flax Lint. I certainly was somewhat startled to find that it did contain cotton. By taking a piece of this lint and detaching from it a few threads, without reference to any particular part, the presence of cotton may be detected; but when the sample is subjected to a more methodical investigation,—when, for instance, the warp is separated from the weft which crosses it at right angles, and they and the fluff on the surface are examined,— it is found that the "warp" consists of a yarn of loose linen fibre, the "weft" of a closely-twisted thread of cotton, and that the fluff on the surface contains no cotton whatever, being composed entirely of flax. I use the words "yarn" with reference to the flax warp, and "thread" to the cotton weft, to convey a tolerably correct idea of their relative size and condition in the fabric. A stray fibre of cotton may be found on the surface, but it is not there in any appreciable quantity. The cotton would appear to have its place and value in binding together, so to speak, the flax yarns; but it forms no part of the linted "pile," consequently all the fibres coming into contact with a wound are pure flax. It is just possible that the presence of a thin thread of cotton as a weft, may make the material lighter and more porous, and assist in producing a larger linted surface to a given weight of lint. The view adopted is probably borne out by reference to the next. I think, therefore, that we are justified in considering this sample as a flax lint.

No. 2 Sample is Maw's Ellesmere Lint, composed entirely of flax in warp and weft, and consequently the fibres of which the linted surface is composed have no mixture of cotton. It is a coarse lint as compared with some others.

No. 3 Sample is Robinson's, of Chesterfield, Flax Lint. Warp flax; weft cotton. Surface for the most part flax.

No. 4 Sample is hand-made lint, composed entirely of flax. It has very little fluff on the surface.

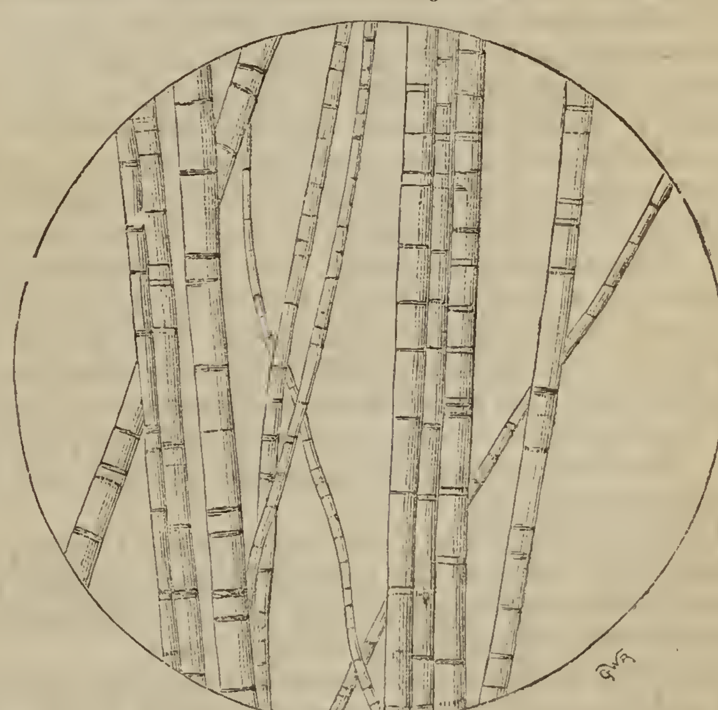
The second question may now be considered. Is the presence of cotton in any quantity really objectionable when forming part of the linted surface? It would be difficult for me by any direct experiment to determine this point. I must leave others to speak. I shall only quote one authority bearing directly on lint, and his remarks I think embody the opinions of most of those who have alluded to the subject. Erasmus Wilson, in his treatise on 'Healthy Skin,' says, in substance, "that he attributes the softness and smoothness of linen to the roundness and pliability of its fibre; the cold feeling to its being a good conductor of heat,—the porosity of its fibre rendering it very attractive of moisture, absorbing it freely, which, as water is a conductor of heat, removes it rapidly from the body. On the contrary, "cotton is a bad conductor of heat; it does not absorb moisture to conduct the heat away. It wants the freshness of linen; it is not, like linen, composed of fibres which are perfectly rounded, but, on the contrary, its fibres are flat



Cotton.*

and have sharp edges, which are apt, in delicate skins, to excite irritation. It is on this account that we carefully avoid the application of cotton to a graze or wound, and employ for such a purpose its softer and smoother rival, linen."

You will observe that his objections to cotton apply,



Flax.*

in the first place, to its being a bad conductor of heat, and, in the second, to the sharp edges of the cotton. His first objection may be valid, but the second has no

* The woodcuts represent the appearance of the fibres by transmitted light.

foundation in fact. Cotton has no sharp edges; its fibre may be compared to a tube of some thin material collapsed, and with rounded edges, ribbon-like, but more or less twisted. The fibre of flax *is* rounded. There is certainly a difference in the feeling between linen and cotton when applied to the skin, to whatever cause this may be attributed.

The superiority of linen to cotton as a dressing for wounds is generally admitted; and I think, therefore, that we may accept as a fact that cotton, in so far as it forms part of the linted surface, detracts from the value of the lint. But how is the occasional preference for hand-made lint to be explained? On carefully comparing a piece of hand-made lint with that made by machinery, both being flax surfaces, I think it can only be a question of the relative quantity of "pile" on the surface of either sample; and a reference to the next lint would seem to support my views.

No. 5 Sample is "Charpie," a kind of lint used in the German hospitals, with reference to which I will quote a paragraph from one of the newspapers:—"*A Good Hint.*—'Charpie' is a game at which all ladies should now be playing. It is played in this way. Tear pieces of linen into fragments about three inches square, and draw out every thread separately. It is capital fun, especially adapted for the delicate fingers of young ladies, who can arrange parties for it at each other's houses; and the best of all is that this charpie—a kind of lint—is invaluable to the poor wounded soldiers, whose sufferings, for the want of such a thing, are often excruciating and intolerable." These detached threads are scraped into fluff, which is applied first, and then covered with the piece that remains, from which the threads have been drawn in one direction only.

No. 6 Sample is Marine Lint, which, through the necessities of the present time, has acquired some notice. For this sample I am indebted to the kindness of Mr. Martindale. In a letter to the *Lancet* of September 2nd, the maker says, "Marine lint is made from a variety of fibres (generally vegetable), prepared by a peculiar process, and will retain its disinfectant qualities and tarry fragrance for many years." I take a piece of this, and clean it by several immersions in methylated spirit. Its tar and its mystery disappear together. It is composed of flax or hemp fibres; in fact, it seems to me to be nothing more than "tow waste" passed through a solution of tar.

One word more as to the means adopted for the detection of cotton-fibre in combination with that of flax.

The microscope is perfectly efficient for this purpose. The value of polarized light in determining form and structure is well understood by the microscopist. I have availed myself of it in these investigations. By its aid, and with a little management in manipulation, every fibre of which the thread or fluff is composed can be told with unerring accuracy. In the examination of a sample of lint, I would suggest that in the first place a low power be employed to determine from the back of it the relative size of warp and weft, their closeness or otherwise; then that fibres from each and also a portion of the linted surface be examined separately by polarized light. By this means no specimen of lint can fail thorough investigation.

If I have succeeded in throwing any light upon, and investing with interest, the subject brought before you, my time in the investigations and yours in listening to the results will not have been spent in vain.

I have here for distribution some lithographic plates of cotton and flax under the microscope, kindly supplied me by Mr. Suffolk, F.R.M.S., to whom I am indebted for much information and many kind suggestions on this subject.

The PRESIDENT said that referring the different qualities of cotton and flax lints to the microscopic structure was an exaggeration and a popular error. If any difference really existed in their relative merits, which many doubt, it probably was not because one fibre was flat and the other round, but because the cotton twisted by being wetted by the moisture from the wound, and by its movement caused the irritation complained of.

Mr. INCE remarked upon the very different practice of this country and that of France and Germany in the selection of lint. In common with many others, he had lately given up a good deal of time to making *charpie* to send to the seat of war. In France, *charpie*, made by pulling out each separate thread of a linen or cotton fabric, was sold by weight. The French and Germans will not use English lint because of the fluff, and large quantities sent out for the relief of the wounded have been returned to England to be exchanged for other articles. The new material called "marine lint" was highly appreciated.

Mr. MARTINDALE referred favourably to the experience of "marine lint" in some of the London hospitals. As an antiseptic dressing, a little loosely applied as a padding, placed above the ordinary lint dressing, it had been found efficacious, especially in cases where there was much fetid discharge, of which it was a most effectual deodorizer. The surgeons at St. George's Hospital spoke well of it, having used it for some time, and at the University College Hospital it had been used with success. Its application was found to add much to the comfort of the patient by destroying the disagreeable odour which is often so persistent from gunshot and other wounds. It had been largely used for this purpose during the American war, where it was first introduced as a surgical appliance.

Mr. BAILDON regarded the prejudice against cotton lint as being without any good foundation, and stated that in the hospitals of Edinburgh cotton lint was used. As to the new "marine lint," carbolic acid was evidently its active agent.

SOCIETY OF ARTS.

ON FERMENTATION.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture III.—continued.

I will now leave these experiments for the present, in order that I may tell you of some other discoveries, which will afford a key to them. One of the most important observations was made, at an early stage of the investigations, on the subject of ferments, by Dr. Schwann. He passed air through a red-hot tube, and he asserted, as the result of his observations, that air which had been so heated was incapable of producing the effects, which I mentioned just now as having been noticed by other observers as produced by common air; that whereas ordinary air starts fermentation, air which has been passed through a red-hot tube does not. That was what he said, and in some of his observations he was quite correct, but in some others he must have been misled. Shortly after his observations, another German philosopher thought of using cotton-wool as a strainer. He passed air through a glass tube fitted up somewhat in the same manner as the one I have here, with a tolerably compact plug of cotton-wool, which allowed the air to pass through it, but at the same time acted as a strainer, and collected a quantity of dirt at the side where the air entered it; and he found that the air which had been thus strained was no longer capable of producing the phenomena of decomposition, which air in the unstrained or unheated state does. Since then, Pasteur has done the same thing in a more accurate and more decisive manner; and he has repeated the experiment with heated air, with precautions which leave nothing to be desired. One novelty in Pasteur's process is the use of a kind of cotton which is soluble—cotton which has been in contact with strong nitric acid, which is called gun-cotton. It retains the structure and appearance of ordinary cotton, but has this peculiarity, that it dissolves easily in a mixture of alcohol and ether. He put into a tube a plug of this gun-cotton, and then, by means of an aspirator, he drew air through this strainer for a long time, until he had collected quite a quantity of dust. He then took this gun-cotton with the dust upon it, and put it into a tube, where he poured alcohol and ether upon it until the cotton was dissolved, and nothing left but the dust. In that manner he got the lightest portions of the dust and the heavier portions by themselves, as they very soon subsided in the liquid in which the gun-cotton had been dissolved. He then poured fresh alcohol upon them, so as to thoroughly cleanse them, and then put them under the microscope, in order to examine the particles of which they consisted. He found in this dust a great many particles of sand, calcic carbonate, and other mineral particles, as would naturally be expected, and also a great quantity of organic matter—little particles of cotton wool, wood, and so on, and mixed with these he found some little spherical or oblong particles of very different sizes, and of some considerable varieties of shape. Some of these little round particles he found consisted of mere starch, and many of you are, no doubt, aware that starch consists of little spheroidal masses of different sizes. These he got rid of by a solvent, and others were then left, which resembled in their appearance so closely the germs of various fungi and organisms of those kinds and eggs of animalcules that they were, to outward appearance, undistinguishable from them. He then took a liquid which had been boiled, but which was capable of decomposing—such a one as I mentioned here—by the action of any of these substances, and he put it into a flask, with precautions which I will not detain you by mentioning now, more than to say that he slid into this liquid, which had not got anything present to induce the formation of organisms, some of the gun-cotton with the dust yet in it. It was the same thing as I mentioned before, only that the substance had got some of this dust from the air added to it; and he found that he also got the formation of organisms very readily and abundantly. He found that these little particles, which were to the eye undistinguishable from germs and spores, behave towards liquids of this kind just as if they were so. In various other ways the same form of experiment has been repeated, and uniformly with the same result, viz., that when little particles collected from the air, particles of extreme tenuity, are put into a liquid susceptible of undergoing decomposition, a great variety of organisms will make their appearance, just as if their seed had been sown in the liquid. This circumstance is one which, I think, will justify us in going back to what I told you of Pasteur's previous observations. I told you that he opened a number of the little bulbs which had contained yeast-water and sugar, so as to allow the air to rush into them. He found that, in some cases, he got one kind of organism produced, and in others another; in fact he got a great variety. But if, instead of allowing the air to go into these bulbs in this way, he poured the liquid out into an open vessel, he always got the same sort of organisms; there was no variety. The appearance of the particles which resembled germs is, as I said, exceedingly various, and there are many reasons to suppose that if there are the germs of these organisms in the air, there must be an immense variety of them, a variety so great that we could not even venture to guess at its extent at present. When the liquid had free access to all of them, it is found, for reasons which would easily suggest themselves, on reflection, to anybody, that some of them, those which can thrive best upon the particular substance, develope themselves to the exclusion of the rest. I will give you one or two examples of the influence of food upon the development of ferments, instances which are well known, and are of some importance, as serving to prove the point which I have just mentioned. You are aware that the mixture which I have been speaking of, yeast-water with sugar, can be made to undergo alcoholic fermentation. I have already referred to it repeatedly in that point of view. We can make it undergo alcoholic fermentation if we put some alcoholic ferment into it, and keep it at a proper temperature; but if, instead of putting some number of cells—and even a few grains weight consist of an enormous number of cells—if, instead of that, we were merely to leave some of this liquid in contact with the air, we should have no alcoholic fermentation set up in it. That particular mixture of yeast-water and sugar does not, when exposed to all these germs, get yeast-cells developed in it, at all events not to any perceptible extent. Instead of that, it gets cells formed which are similar to those in the second bottle I showed you, which is forming lactic acid, that is to say, the lactic fermentation will set in. The fact is, that the liquid is unwholesome for these particular cells; and does not agree with the alcohol cells, or yeast-cells, so that if a great number of various germs are thrown into these particular substances, those which can thrive better, which are the lactic acid cells, develope themselves, and the alcohol cells do not. Again, if instead of taking this decoction of yeast and sugar, you were to take some grape juice, you would have alcoholic fermentation at once. That is the way it is done. If I were to leave a decoction of malt in contact with the air, in the same manner you would get the same thing set in as a rule. Again, if some of the liquid which I have in the glass dish here—some of the yeast-water with a little alcohol and acetic acid—be left in an open vessel, it gets an organism formed upon it; in fact, that is a process which Pasteur recommends for getting vinegar cells, if you want any. He says the air will, if you give it time, and supply the requisite conditions, start these cells in that mixture, but no alcohol cells, nor lactic acid cells, can be grown in it. It does not suit them; it is a substance which suits vinegar cells, and them only. Whatever may be the variety of the cells present in the air, it only developes those of that particular kind.

(*To be continued.*)

ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.

The First Meeting of this Association for the season was held on Saturday, October 15, at the Scottish Corporation Hall; the President, Dr. Druitt, in the chair.

Specimens of the new antiseptic chlor-alum, Whitehead's soup squares and meat preserved by Mr. Richard Jones's process were exhibited.

Mr. Rogers introduced the subject of the registration of disease, which he advocated with great earnestness.

Dr. Druitt read an address on the Sanitary Topics of the Day. Alluding to the prevalence of scarlet fever in the metropolis, he said that this was the season when it might be expected to increase after a partial diminution during the summer months. In the week ending October 8, 192 deaths from this disease were reported, being the largest number registered since last December. It was clear that we wanted a registration of disease, coupled with a provision for making its existence known to the sanitary authorities. The existence of scarlet fever in a house instead of being made known, is, from various reasons, studiously concealed. It was clear that scarlet fever is propagated by the bodies of the sick, and the clothes, apartments, etc., contaminated by them, or by such causes as fermenting heaps of impurities, receptacles of excretions, drains, and the like. He believed scarlet fever to be emphatically a product of sewer gases. In disinfecting pipes and sewers by carbolic acid a sufficient quantity should be used to drench the whole canal, as infusoria in putrid water are not killed until the acid is freely used. As a disinfectant for rooms and bedding, he preferred the fumes of burning sulphur to any other. He advocated periodic fumigations of crowded houses; the drenching of drains, closets and earth with carbolic acid; the oiling, staining and hardening of floors, so that instead of being scrubbed, they might be cleaned with something of the turpentine kind; the abolition of fixed carpets in bed-rooms, and the burning of the sweepings of sick-room floors. The other subjects discussed in the paper were, the Contagious Diseases Act, baby farming, the principles of sanitary law, the necessity of Building Acts, the dwellings of the poor and local taxation.

Dr. Rogers believed that scarlet fever arose from animal decomposition. In twelve years' experience at the Strand Union he had never had a case of scarlet fever spread in the sick-wards, while eleven or twelve days after a woman entered the receiving ward with a child that had the measles, the disease ran through the whole of the nursery, which was fifty yards off. Scarlet fever was more under control, he thought, than any other of the preventible diseases. The reason of its spreading so rapidly in some districts was that the excreta were not properly got rid of. At the Strand Union the drains were of the best, and as soon as there were any smells in the wards he punished the nurses by stopping their beer and other extras. The result was, the smells soon vanished.

Dr. Liddle thought inspectors should be appointed to decide whether houses were fit for habitation or not, and if not, Government should take steps to pull them down.

Dr. Gibbon said the result of the last speaker's action would be that the poor would have no houses at all, for he had made ample provision for pulling them down, but none for building them up again.

Dr. Aldis said that at Eastbourne an outbreak of scarlet fever had originated in the old and badly-drained portion of the town.

Dr. Tilly remarked that he had recently inspected forty or fifty houses, into which there was a constant admission of sewer gases.

Dr. Stevenson said he had found sulphurous fumigation very effective, but there were considerable difficulties in the way of burning sulphur. The bisulphide of carbon was very volatile, and should be used carefully, but it was much more effective than solid sulphur.

Dr. Iliff said scarlet fever in his parish had not originated from dirt, filth or bad drainage.

MEETINGS FOR THE ENSUING WEEK.

Wednesday, *Pharmaceutical Society of Great Britain.*—"On Some of the Infusions of the Pharmacopœia." By Mr. J. B. Barnes.—"On the Purity of some of the Alkaloids of Commerce." By W. L. Scott, F.C.S.

Thursday, *London Chemists' Association.*—"Belladonna and its Preparations." By Mr. R. Pick.

Parliamentary and Law Proceedings.

Thames Police Court.

BEFORE MR. PAGET.

The Shipment of Dangerous Articles.

Messrs. James M'Ewan and Co., merchants and shipbrokers, of Cannon Street, City, were summoned before Mr. Paget, at the instance of the East and West India Dock Company, for unlawfully causing to be sent to the East India Dock for shipment on board a vessel called the "Coloena," two packages of mineral extract, without distinctly stating the nature of such goods on the outside of the packages containing the same, or otherwise giving due notice thereof to the superintendent of the dock, whereby the defendants had incurred a penalty not exceeding £20. It was proved that three packages of goods were shipped on board the "Coloena" for Wellington, New Zealand, as lamps. Two of the packages contained a highly combustible and dangerous substance, petroleum spirit, and the third only contained lamps. The dangerous nature of the petroleum spirit was proved by Mr. Ogston, analytical chemist, on behalf of the dock company, and it was stated by Mr. Young that if an explosion had occurred on board the "Coloena" on the voyage nothing could have saved the ship, cargo, 110 passengers and crew from total destruction. Mr. Paget said the liquid shipped on board ship was a most dangerous article. It was described as the most dangerous part of petroleum, and very inflammable. If the stuff had been shipped, and stowed away under hatches, every living soul on board would have been on a volcano. This was a case of so much importance that he felt bound to inflict the full penalty of £20 and £3. 5*s.* costs.—*Times.*

Worship Street Police Court.

BEFORE MR. BUSHBY.

Alice Maud Kemp was charged, on remand, with having attempted suicide by taking laudanum. The facts of this case were reported last week. The prisoner stated that she had purchased an ounce and a half of laudanum at Mr. Cooper's, chemist, of Amherst Road, Hackney.

The prisoner, in answer to the magistrate, said that when she purchased the poison at Mr. Cooper's she stated that she wanted it for some silk. She could not say for what purpose laudanum might be used with regard to silk, but she said that as it was the first thing she thought of. She had only been there once before, but Mr. Cooper did not know her address or name until she told him at the time of purchasing the laudanum. She denied that she had stated she wanted the poison for a lotion for her leg.

The mother of the prisoner having expressed her willingness to become surety for her daughter's good behaviour for one month, she was set at liberty.

A solicitor wished to address the Court upon behalf of Mr. Cooper, but

Mr. Bushby said that he could not hear him, as Mr. Cooper was not before the Court. Adverting to the sale of the poison by Mr. Cooper, Mr. Bushby said that from what the prisoner had stated, it appeared that the poison was sold by the chemist to her without any introduction given by a friend known to both, as required by the Act of Parliament, and without any previous knowledge of the party to whom he had sold the poison. In the interest of the public safety he, Mr. Bushby, thought that the police should make inquiries into the case, and see if the 17th section of the Act (31 & 32 Vict.) had not been infringed, and he directed that to be done.

The solicitor begged to be allowed to call attention to the Act.

Mr. Bushby declined to allow anything so irregular. If the police found that the Act had been infringed, and Mr. Cooper was brought before the Court to answer for having incautiously sold the poison, there would be ample opportunity of arguing the question.

At the Southwark Police Court, a young woman charged with being destitute and creating a disturbance in the public streets, said that she had been to a chemist the evening before, and had he supplied her with what she wanted she would have been dead by that time and all her sorrows forgotten.

[*** This case serves to illustrate the truth of the opinion expressed last week, that druggists are careful to exercise discretion in the sale of poisons.—Ed. Ph. J.]

At the Manchester Police Court, on Tuesday, October 8th, a lamp manufacturer was summoned for having thirty gallons of petroleum stored in a cellar without a licence. The defendant, who had been refused a licence six months ago, because he had failed to comply with the instructions of the watch committee, was fined £10, and the petroleum and vessels containing it were ordered to be forfeited.

Notes and Queries.

*** *In accordance with a wish expressed by numerous correspondents, a column will in future be devoted to notes and queries, with the object of facilitating the exchange of information among members of the trade and students.*

In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[1.]—GALLIC ACID SOLUTION.—*A. P. S.* would have well rubbed the gallic acid in a mortar and made into a solution with ʒvj of the S. V. R. and aq. rosæ previously mixed, and have rinsed out the mortar with the remaining ʒiv; he would also have affixed a "shake the bottle" label above the ordinary label. He thinks it impossible, according to all writers and his own experience, to keep gallic acid "in such a concentrated state" in solution, except at about 200° F.

I beg to say that I should have dispensed the prescription as follows:—

Introduced the sp. vini rect., aqua rosæ and acid. gallic. into a test-tube, shaken them together and applied heat until a perfect solution was obtained, after which I should have poured it into the bottle I intended for it. When I found that the mixture "congealed" on cooling, I should have ascertained what directions the prescriber had given for its use. If they were such as could be applied to the mixture in the congealed state, or when "liquefied," by placing the bottle into a vessel containing "hot" water, well and good; but, if otherwise, I should have communicated with the prescriber, informing him that the mixture could not be used, if made up in the manner prescribed, and suggesting that a "perfect" solution might be obtained by subtituting "glycerine and otto of rose" for the aq. rosæ, or "acid. tannic." for the "acid. gallic.," either of which when treated in the above manner, will form a mixture that does not congeal on cooling.—J. T. C.

[2.]—MOUNTING MICROSCOPIC OBJECTS.—*R. J. M.* will find every information required as regards the mounting of objects, etc., for the microscope in Wood's 'Common Objects for the Microscope,' 1*s.*, or Lankester's 'Half Hours with the Microscope,' 3*s.*, either of which he may procure from any London publisher. The latter is an excellent little work.—J. T. C.

[7.]—CHILBLAINS.—In reply to *J. W. D. H.*, a correspondent sends the following:—Magnes. sulph. c. potass. oxymur. omni mane.

[9.]—GREEN FIRE.—

℞. Pul. Barytæ Nit. lbj
Pul. Potassæ Chlor. Ex. ℥j
Pul. Gum Shellac ℥iij
Pul. Antim. Nigri ℥ss
Misce secundum artem.—W. A. C.

℞. Barytæ Nit. ℥xij
G. Shellac ℥iss
Potassæ Chloratis ℥j
Carbonis ℥ss
Arsenici ʒij
Note.—Let the Shellac be well powdered.—Druggist.

℞. $BaNO_3 = 62\frac{1}{2}$
S $10\frac{1}{2}$
KCl $23\frac{3}{4}$
C $1\frac{3}{4}$
Sulphuret of Arsenic $1\frac{3}{4}$
Mix.—A. H. J.

Reduce to an impalpable powder separately, and mix together in a sieve,
Nitrate of Baryta 16
Picrate of Ammonia 6
Flowers of Sulphur 2.
Burns with great brilliancy; yields no smoke.—A. H. J.

Answers have also been received from "*Corsock*" and *J. F. Pollard*, giving recipes essentially the same as the above.

FIL D'ARCHAL.—While looking for something else, the communication of "*Ignoramus*" in the Journal for July 30 has just caught my eye. The articles in question belong, if I am not mistaken, to a small perfume lamp, of which I have a specimen. It is not unlike an ordinary spirit-lamp, except that the wick is confined in a glass tube fitting loosely in the neck, and retained in its place by a flange at its upper end.

To use the lamp it is partly filled with perfumed spirit, and the stalk or "handle" of the platinum ball is thrust into the wick so as to allow the latter to project a little above the ends of the strand of cotton composing it. The wick is then ignited, and when the platinum sphere is red-hot the flame is blown out with a sharp puff. If shielded from draughts of air, the metal ball will retain its temperature by continuing to decompose the vapour of the spirit rising through the wick.—J. F. Brown.

OIL OF KERMES.—*D. C. L.* writes in answer to "*Quærens*" that syrup of red poppies is sold as oil of kermes in the West of England.

[12.]—TEETH STOPPING.—"*Odontalgia*" would be glad of a good formula for metallic cement for teeth-stopping.

[13.]—EAU SÉDATIVE.—Can any one of your correspondents tell me how to make an elegant preparation of the following French recipe?

Strong Liquor of Ammonia . . . . ʒxvss
Camphorated Alcohol . . . . . . ʒijss
(made by adding 150 parts camphor to 500 alcohol)
Salts . . . . ℥vijss
Water . . . . ℥xvij.

[14.]—SACHET PERFUME.—"*Ignoramus*" wishes to know the best method of perfuming a writing-desk, or making a suitable sachet for the same object.

[15.]—MEZEREON EXTRACT.—Is the mezereon extract contained in the lin. sinapis comp. of any other use than as a colouring agent?

[16.]—ROME AND PARIS.—*A. S.* asks at what hour the pharmaciens in Rome and Paris close in the evening?

[17.]—AQ. MENTH. PIP.—*W. S. R.* wishes to be informed why aq. menth. pip., made with the foreign oil, turns pink upon exposure to the light.

[18.]—RUBINI'S CAMPHOR.—*J. Botham* wishes for a formula for Dr. Rubini's Camphor.

[19.]—SALE OF POISONS.—*E. P. W.* wishes to know if grocers can legally sell "Wheat Dressing" and "Fly Powder for Sheep," or whether these preparations are to be classed as vermin killers.

[20.]—BLEACHING LARD.—*T. B. Allkins* wishes to be informed of a cheap and easy method of bleaching lard, without impairing its qualities for domestic use.

[21.]—GLYCERINE JELLY.—*R. W. W.* (Sheffield) is in want of a good recipe for making glycerine jelly.

[22.]—COSMETIQUE.—*A. P. S.* would be glad of a good recipe for making brown cosmétique for fixing the hair and moustache.

[23.]—COLOURING FOR POMADE.—*S. W. S.* (Hull) would feel obliged by any of our readers telling him of a good colouring ingredient for pomade (yellow) which will not fade with the light.

BOOKS RECEIVED.

Notes sur les Quinquinas. Par H. A. Weddell. Paris. Victor Masson et Fils. 1870.

Transactions of the Clinical Society of London. Vol. iii. London. 1870.

Copy of all Correspondence between the Secretary of State for India and the Governor-General, and the Governors of Madras and Bombay, relating to the Cultivation of Chinchona Plants, from April, 1866, to April, 1870. Return ordered by the House of Commons to be printed. 1870.

Plea for Pure Science: being the Inaugural Lecture at the opening of the Faculty of Science in University College, London. By A. W. Williamson, Ph.D., F.R.S. London: Taylor and Francis, Red Lion Court, Fleet Street.

Correspondence.

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

Pharmaceutical Titles.

Sir,—In your issue of the 17th ult. a letter appears, signed "Omega," on which I should like to make a few remarks, since I consider it to refer to all who, with "Aspirant to the Major" and "T. C.," share the opinion that some distinct title ought to be given to those who have succeeded in passing the three examinations of the P. S. at great expense not only of money but of time. "Omega" accuses us of wishing "to parade our intellectual status," which is, by his bitter repining for a grand flaming diploma, evidently one of his peculiar weaknesses, but where he has seen this desire displayed amongst the Major Candidates beyond the ordinary desire all men have of reaping some advantage by their expenditure of money and labour, I am at a loss to conceive; he seems to think it very unjust that those who have worked hard for many months to pass the three examinations of the P. S., should enjoy any precedence over those who have merely passed such an examination as any apprentice who has been in the trade a year or two ought to be able to pass creditably.

I suppose our dear brother in pharmacy is one of those persons of retiring demeanour (and surely he had better have kept in the shade than have paraded his ignorance before the eyes of an intelligent profession) who wish for a higher social position, but shrink from paying the inevitable price of hard labour, energy and perseverance. If he have a very burning desire for a grand flaming diploma, I should advise him to apply the saying of the great man whom he quotes to himself, and employ his time in getting sufficient wisdom whereby to pass the Major,—and he might at the same time get a little understanding, of which he seems to be sadly in want at present,—and then he may also find that there is a higher reward in the satisfaction of having improved his mind than in having a title to his name or even than in having obtained that supreme height of human bliss,—the possession of a grand flaming diploma. But even if he does not choose to take my advice, he may still have the satisfaction of deceiving the public into the belief that he is on an equality with a Pharmaceutical Chemist by styling himself "Chemist by Examination of the Pharmaceutical Society," for the public can see no difference between the two terms.

I am also ignorant of the remarkable fact of which our correspondent kindly informs us, viz. that true doctrine leads men to humble themselves before men; I had rather thought that it led them to humble themselves before their Maker, not before their fellow-men, but probably our correspondent's humility is another of the virtues which he is anxious to parade before the eyes of the public.

Before he next exhibits himself in print for the ridicule of the profession, he had better take the trouble to consult Dr. Johnson, where he will find that doctrine and knowledge, advice and motto, are not synonymous terms as he uses them.

I must now leave our dear brother to agitate for his grand flaming diploma, and sincerely hope he may succeed in obtaining it, when, as he gazes on the coveted object of his life, he will, perhaps, be content to hold his peace and leave us to obtain our title of Fellow undisturbed.

Candidate for the Major.

Sir,—The reason why Major men would like the title of "Fellow" is, that at present the public are quite unable to distinguish between them and the Modified men. In fact, a friend of mine, who has passed the Modified Examination is considered far in advance of me by some, because he went up to London and passed it immediately, whilst I had to prepare for the Major.

To show the necessity of parading our status even before our *confrères*, I would mention that a Minor Associate opened a shop just before the passing of the Pharmacy Act, and, being elected a member of the Society, a chemist close at hand quite thought he had a Major to contend with, because he was a member. Again, Modified men call themselves "Chemists by Examination of the Pharmaceutical Society," and boast that their title sounds grander than ours; and when asked what is the difference between an Associate and a Member, reply, that "all Associates have been examined, but that all Members have not."

In conclusion, I think that if the Society could be called "The Royal College of Pharmacy," its Majors and Founders, "Fellows," and its Minors and Chemists "Members," our whole Society would be raised in the estimation of the Public.

Alpha.

Dear Sir,—No one will dispute the fact that the vast majority of the public does not appreciate the difference between the titles of Pharmaceutical Chemist and Member of the Pharmaceutical Society. I confess that I fail to see how those members who are such merely from being in business two years ago, can object to all who have passed the Minor and Modified Examinations being classed with them as members, whilst the Founders of the Society (that is to say, all who were members before the Act of 1868) could then, with all those who have passed the Major Examination, enjoy the title of Fellow. If such were the case, it would perhaps be found advantageous to admit those who pass the Preliminary Examination to the title of Associate. We should then have three distinct and well-marked gradations of rank in the Society, which could hardly fail to be understood by the public, as only the Fellows and members could conduct businesses.

I feel confident that the agitation which is now commencing on this point will rapidly attain its end, and the thanks of all concerned will be due to you for your courtesy in inserting correspondence on the subject.

Philip H. Mason.

Norwich, September 2, 1870.

Sir,—I have noticed several communications in your Journal on pharmaceutical titles. I fully agree with some of them. "Aspirant to the Major" tells us that the "Modified men" are of a class whose retiring dispositions are such that they are perfectly satisfied with their present attainments. I think it might be proved that he is under a delusion to suppose this, for some of them, I have no doubt, would be glad to compete even with "Aspirant to the Major," were it not for the expense and—a not less important thing—the sacrifice of time required for the Major. I do not hesitate to say, any young man of ordinary ability can pass either the Modified or Minor Examination by making good use of his leisure time and working systematically, without losing more than a week in London; whereas for the Major, it is almost imperative that he should have a course of study which it is next to impossible to obtain in the ordinary routine of business.

The titles themselves are very secondary, I have no doubt; but the public can in a great measure judge of their chemist's ability without requiring to see his diploma. Should it be deemed necessary to make a change, let the pharmaceutical chemist be Fellow, the chemist and druggist Member, and he who chooses to subscribe to the Society, and has passed the Modified or Minor, Associate,—each having his certificate to that effect. If "Aspirant to the Major" studies the lists of the Minor Examination, he cannot but be convinced that large numbers stop at this qualification, and consequently will be a very strong body, unless the Pharmaceutical Society step in with an additional Act, enforcing all to pass the Major Examination.

Wakefield, Oct. 17*th*, 1870. A. P. S.

Sir,—"To be, or not to be?" that is the question. Is it granted, or is it *not* granted, that the Modified Examinations of the Pharmaceutical Society are worthy the time and labour of the gentlemen conducting them? If not sufficiently stringent, why do the Privy Council sanction, the President and Council of the Society endorse, and the majority of our brethren acknowledge them? Such are the questions I submit to the omniscient philosophy of our worthy friends "Spes" and "Aspirant to the Major."

"Spes" does not see his own fault when complaining that last session he passed the Minor, and, not being able to distinguish the "Major" title from the great bulk of titles accorded to the body of English chemists, he declined "going in" for the "grand event."

In "Aspirant's" former epistle he gives us to understand that we Modified men "resort to means whereby we may mystify the public," and that they, the Majors, having passed a highly scientific examination, have not the least desire to do so. Had he been addressing his note to an independent journal there might have been some need of such a full explanation regarding the curriculum for these large minds; but, as the letter appeared in our Journal, I contend that all of us knew, in all probability, as much about the examination for Fellows as "Aspirant" did; hence I maintain the great desire of parading his *status* before our eyes, which, however, he flatly denies.

It seems to me an injustice not to grant a similar diploma to the one given to men simply on account of their being in business prior to the Act of 1868 to all who have gone in for and come out from the "very modified affair." The whole tenor of "Aspirant's" ill-wind has been directed against Modified men (he forgetting those who have not passed any examination); consequently I have taken upon myself, as much as lies in my power, their defence, in the hope that abler hands will render assistance, seeing that we are constantly being slighted.

I suppose it is perfectly understood that all men in business prior to the late Pharmacy Act (whether old or young) are entitled to become members, to sit on the Council (if elected), and to have a "grand flaming diploma;" whereas we, the "Modified men," are not entitled to any one of the former, but, whether old or young, we are allowed to pass the Minor (I believe) and Major Examinations, and then we can assume the same titles as our scientific brethren, but on no account can the law be relaxed towards us (as I think it was with regard to Assistants), so that we might be on a par, not with Pharmaceutical Chemists, but with members of the Society.

Barnsley, October 11th, 1870. OMEGA.

Sir,—I put in a plea for the "Modified gentlemen," as they are called; certainly I shall never forget the scene which I witnessed in the Society's Library on the morning of the examination day on which I was present. There were fifty men, most of whom had been dragged out of the even tenor of their way from all parts of the country; some of them considerably over thirty years of age, with business settlements and prospects, to show reason why they should call themselves "Chemists." From several I heard tales of real suffering and hardships, the inevitable results of retrospective legislation.

And now, to find youthful "aspirants" tauntingly write of "retiring dispositions," "very modified conclusion," etc., must to some be rather irritating, and warrants the remark that such expressions are neither dignified nor brotherly. For my own part, it was of little consequence to me whether one examiner told me that I could read a Latin prescription, or another, that I knew one tincture from another, when for more than ten years I have either personally or by deputy dispensed about eighty prescriptions a day. I base my claim (and so I feel persuaded do all my Modified friends) to be a Chemist and Druggist, not upon having passed the Modified Examination, but upon having honourably served a term of apprenticeship to the business. Personally I should scorn to write up "Chemist by Examination of the Pharmaceutical Society." It is untruthful, because intended to convey more than the truth.

"ALPHA" (1).

Sir,—"Aspirant to the Major" speaks patronizingly of the "very modified curriculum" through which the Modified gentlemen have to pass; leading any one to regard such an examination as a mere farce, and in reality no test at all. I would ask if this be complimentary to the Council of the Pharmaceutical Society? They have instituted this examination professedly for the purpose of testing our ability, and are we to conclude that gentlemen in the capacity of examiners will waste their time in conducting a sham? If it be no test, why does it exist? I think by referring to "Omega's" letters, "Aspirant" will find that he chiefly complains of the injustice of established Chemists and Druggists, who have not passed any examination (not even excepting the "very modified test"), being admitted Members of the Society; whereas we, who have also complied with the requirements of the Pharmacy Act (though belonging to those of retiring dispositions), are only admitted as Associates. This is the objection. Place us upon terms of equality with those who were in business prior to 1868, and we shall be satisfied.

Barnsley, October 19th, 1870. "ALPHA" (2).

FEEDING BOTTLES.

Sir,—In connection with the subject of infants' feeding-bottles allow me to draw your attention to the following important statement, which appears in the official report of the Hon. Mr. Thurlow to the Foreign Office, on the International Exhibition of Domestic Economy held at Amsterdam last year, concerning an infants' feeding-bottle exhibited there.

L. M.

"This infants' feeding-bottle meets with so much demand in Lancashire, where I am told its sale is counted by several hundreds of thousands each year, and indeed on the Continent, wherever it has been introduced, that I could not but regard it as my duty to inquire of Professor Gunning, the Government Analyst at Amsterdam, the reasons which had led to its condemnation. These reasons were kindly given to me, promptly and without reserve; and the question being one, in which it is of the first importance, to challenge criticism, and by all means to arrive at the truth, I do not hesitate to quote them in translation, leaving the further discussion of the knotty points involved to the scientific world. With these objections, which probably apply more or less to all infants' feeding-bottles made upon the same principle, I shall close this review of Class IV.:—

"'I object to the 'infants' feeding-bottles' in all instances when any part of them is composed of caoutchouc, or any like material. There is nothing so ill suited to the constitution of the human body as the material in question. Milk, which by contact is only slightly tainted with the smell thereof, although this is, perhaps, imperceptible to the keenest sense, must have lost a portion of its quality of quick and easy digestion.

"'When, in consequence of suction, the pores of the caoutchouc are enlarged, some portion of milk always remains behind in them, which cannot, or at least cannot without great difficulty, be removed. This milk quickly becomes bad, and spoils the fresh milk with which it comes in contact. The caoutchouc material in question is made up of several ingredients. White zinc or white lead is very commonly employed, which are very poisonous. My objections are not founded exclusively on *à priori* conclusion. In this country many fatal cases have happened among infants, which, on solid grounds, may be ascribed to the use of these bottles.'"

HYDRAULIC PRESSES FOR TINCTURES.

Sir,—In the very useful and interesting article on Tinctures by Mr. Umney, found in this week's Journal, he mentions the use of the hydraulic press for the recovery of the solvent. There can be no question as to the great saving that would be effected by this means as compared with the screw.

The hydraulic press is a very simple piece of mechanism. I greatly wonder that no mechanician has introduced a handy little press, suitable for tinctures in quantities of from 2 to 4 quarts. Is it not worth some one's while to think of it? By the bye, is Mr. Umney right in attributing a loss of 37·5 per cent. to the preparation of tinct. zingiberis fort.?

Manchester, Oct. 22nd, 1870. J. T. SLUGG.

HOSPITAL DISPENSING.

Sir,—Allow me a few words in reply to Mr. Fitch.

I did not intend the remark "greasy card" to apply to his case, although if he will examine the patient's card at this date I feel sure he will find it in that state.

Upon the second or third visit to the surgeon, the card is generally unfit to write upon. If Mr. Fitch understood hospital work, he would not rush to print his single complaint. The majority of cases are greatly exaggerated.

Scores of patients never intend and never do take the medicine given. All bottles ought, of course, to be properly labelled.

I have had posted in the waiting-room the following

NOTICE.

"Send for medicines as early as possible after the visit of the surgeon as the dispensary hours permit.

"Bring clean bottles, etc. Take the corks out of the bottles. Let all labels remain on the bottles. Medicines will not be given to children."

With Mr. Fitch, I hail with pleasure the "good time coming," but it will not be in his time nor mine.

EDWARD BARBER.

83, *Devonshire Street, Sheffield.*

Public Dispensaries.

Sir,—That a stricter surveillance is necessary in the management of our public dispensaries will, I think, be granted by every one at all conversant with the subject. I am convinced there are few chemists in our larger towns but could narrate instances, if not of the blundering, most certainly of the slipshod manner in which the dispensing is conducted in these dispensaries. The following instance of the latter may be given, not as one of the grossest, but as one of the most recent that has come under my own observation, having occurred no later than Saturday last.

A poor but respectable woman received a prescription, which she was instructed to present at one of our public dispensaries. The prescription was for drops (liquor of arsenic) and an ointment (nitrate of mercury). She had no phial for the drops, but one was supplied her, charged for, and then handed to her *without a cork*. Part of the contents in consequence were spilt in the basket in which she carried it, and more than probably amongst the small purchases she had been making when out, and was then carrying home. On the phial was the simple word "Poison." No label to state whether for external or internal administration. No name to indicate where it had been got. No number, as indeed there could not be, seeing the prescription was not copied. She was asked for a box, into which to put the ointment, and as she had none, a two-ounce willow box was given her, and into it was placed the two drams of ointment ordered. (The ointment, I may state, was quite black.) This box was an old one which had previously contained pills, and the pill-label was neither removed from the lid nor a new one pasted over, so that the ointment was actually sent out labelled as pills. For this box the charge of *one penny* was made, but whether this penny was a perquisite to the dispenser, or was one of the sources of income of this most excellent charity, I could not discover.

I neither expect nor advocate for our public charities all the comforts or niceties of independent means, but I do expect, and would insist that the ease or comfort or indifference of our public dispensers should not interfere with the proper discharge of their duty, or neutralize in any way the good of these useful and worthy institutions. Δ.

Pharmacy and Medical Practitioners.

Sir,—As a proof of the "monstrously excessive charges" which we shall be enabled to make if "this spirit of bickering" be further indulged in, the following prescription was handed to me this week,—"Tincture of *Actæa racemosa*, ½ ounce;" and as the patient supplied his own bottle, you can imagine the amount of profit made by the transaction. I have received several similar prescriptions written in Latin, with either verbal directions or "To be used as directed," and on being repeated, the article has been asked for in English. In all cases the parties have been in by no means "humble circumstances." In one case the patient was told to ask for "1 drachm of pill mass, for which the charge would be 3*d*."

I cannot agree with your correspondent that "it is a most extraordinary fact that chemists in one part of town should charge as much for preparing a prescription as medical men should charge for both visit and medicine in another," as he must be well aware that "locality regulates prices" to a great extent. I certainly should be surprised if I paid the same for having a mixture dispensed in Bond Street and Ratcliff Highway.

We should all be extremely obliged to "Reformer" if he would kindly inform us where retailing ceases and counter practice begins, as I was informed by a medical gentleman the other day that digestive pills, hair washes and cough linctuses were decidedly "contraband of war," and I fear until I see the "breadth of the line" more clearly, I must remain,

"A Pharmaceutical Sinner."

Sir,—When I read the letter of Mr. Mee, upon the extract from the *Lancet*, I was astounded at the one-sidedness of it. If chemists were in the same odour with the public as the surgeons, at least 50 per cent. of the former would "cave in" instantly, and the remainder within a short period. A head of a family has just informed me that those doctors' bills are the black spots flickering about his memory day and night. I try to relieve him for 6*d*. or 1*s*., whilst he has to pay three times as much for the "nobbut water and salts" of the doctor. The haphazard messes that leave dingy surgeries are not to be classed at all with the correctly-dosed and neatly-wrapped bottles of the chemist; the patient, sick and weary, will not swallow aq. menth., made by adding ess. menth. to aq., with the oil floating in greasy abundance round the bottle. I have dispensed for surgeons and supplied them with the whole of their drugs; I find 2½ per cent. an average outlay, or £25 per £1000 practice,—this does not include bottles,—the bottle is frequently the most expensive part of the parcel of medicine. Mr. Wade's letter is to the point; the day will be when the inert mixture and cheap pill must give way to the well-studied prescription; the cost being a secondary matter where human life is at stake. J. Houlton.

F. R. (Camberwell).—The object of washing ether is to separate alcohol. The use of ether in this preparation has been condemned by good authorities. It will probably be omitted from the form in the next edition of the B. P.

J. W. (Attercliffe).—(1.) The formula in the B. P. *is* correct for the definite salt. Attfield, in his *Chemistry*, p. 180, states that the process does not yield *this* salt, but a mixture of two subacetates having the formula written by our correspondent. The process can only be symbolized in the modern notation satisfactorily upon the latter supposition. (2.) First person singular, indicative mood, perfect tense, of the Greek *heurisko*, to find out or discover.

T. Grainger (Birmingham).—The labels sent would be liable to stamp duty. As explained in the Appendix to the Calendar of the Pharmaceutical Society, the Medicine Stamp and Licence Acts require that if the medicine be a secret preparation, or if it has been recommended on the label, or on a handbill, or by any public advertisement, for the cure or relief of any disorder, it shall then be stamped and the vendor must take out a licence for its sale.

Advertising by Postal Cards.—The manager of the Floriline Company writes, in reply to a letter from a "Country Chemist," in which he supposes the Company to be alluded to, that (1) the price cards were only sent to the trade, so that with the exception of the letter-carrier they would not be likely to be seen by the general public; (2) that the article advertised would not be supplied to any but the trade, except at the retail price, no matter in what quantity ordered.

G. M.—(1.) Yes. (2.) Melt equal parts of zinc and tin together, and combine these with three parts of mercury: the mass must be shaken until it is cold; the whole is then rubbed down with lard to the proper consistence.

"A Country Apprentice."—The Latin Grammar.

"Registered Student" (Alnwick).—(1.) Yes. (2.) Yes. Apply to the Registrar.

W. A. C. (Lynn).—The numbers of the specimens this year were—Mr. Webb's, 460 and duplicates? Mr. Rammell's, 542; Mr. Wood's, 330.

A. H. J.—The questions were published at p. 288–9.

"Ignorans."—The chemists and druggists eligible to be elected members of the Pharmaceutical Society are those who were in business before the 1st of August, 1868, and the Associates those who were admitted before the 1st July, 1842.

"Inquirer."—We should think a perfectly saturated solution of chloride of iron is meant, or such a preparation as the ferri perchloridi fortior liquor of the B. P.

"Botanist" (Southport).—Professor Oliver's 'Elementary Lessons in Botany' is published by Messrs. Macmillan and Co., price 4*s*. 6*d*.

"Santonica" (London).—(1.) Make the citrine ointment twice over. (2.) We have not observed this action, and do not see why it should occur. Your description indicates the reduction of a portion of the oxide to the metallic state.

J. Botham (Manchester).—Dr. Rubini's camphor is a proprietary article. We do not know of a formula for its preparation.

Communications, Letters, etc., have been received from Mr. J. F. Brown (Dover), Mr. A. P. Towle (Manchester), Mr. J. H. Gortling (Halesworth), Mr. T. B. Allkins (Tamworth), Mr. J. Houlton (Wetherby), Dr. Divers (London), Mr. Reynolds (Leeds), Mr. H. W. Maleham (Sheffield), Mr. A. H. Mason (Liverpool), Mr. W. Shaw (Hull), Mr. C. Tucker (Bridport), Mr. W. D. Williams (Salisbury), Mr. T. Perkins (Norwich), Mr. Davies (Liverpool), Mr. F. H. Cumine (Southport), Mr. Hornsby (Brighton), "Assistant," "A Pharmaceutical Sinner," D.C.L., M.P.S.

The following journals have been received:—The 'British Medical Journal,' Oct. 22; the 'Medical Times and Gazette,' Oct. 22; the 'Lancet,' Oct. 22; 'Nature,' Oct. 20; the 'Chemical News,' Oct. 21; 'Journal of the Society of Arts,' Oct. 20; 'Gardeners' Chronicle,' Oct. 22; the 'Grocer,' Oct. 22; the 'English Mechanic,' Oct. 21; the 'Journal of Materia Medica' for October.

THE OPIUM TRADE OF CHINA.

BY P. L. SIMMONDS.

Few are, perhaps, aware of the enormous trade still carried on in opium from India to China; and what is, probably, even less generally known, is that the poppy is largely cultivated in China itself, and that the native drug is beginning to replace much of the Malwa opium. Mr. R. Fortune saw the poppy extensively grown in China for the purpose of inspissating the juice, but was able to form no estimate of the quantity actually grown. We have, however, confirmatory recent evidence of the extension of the culture and production in China. More than thirty years ago it was stated in the *Chinese Repository*, on the testimony of the counsellor Choo Tsun, that in his native province, Yunnan, the poppy was cultivated all over the hills and open country, and that the quantity of opium annually produced there could not be less than several thousand chests. Indian opium now brings in an average annual gross revenue to the Indian Government of about £8,200,000.

The value of the opium shipped from India to China in the last ten years is thus given in the official statistics; from which it will be seen that the average annual import has not varied very greatly in the two quinquennial periods, although there are alternate high and low years, and the price fluctuates much:—

	£		£
1860	9,054,394	1865	9,911,804
1861	10,184,713	1866	11,122,746
1862	10,553,912	1867	10,431,703
1863	12,494,128	1868	12,309,915
1864	10,756,093	1869	10,695,654
Total	53,043,240	Total	54,471,822
Average	£10,608,648	Average	£10,894,364

In 1856 the consumption of Indian opium in China was about 82,000 chests of 140 lb. each, but this was exceptionally large.

In his report upon the trade of Tien-tsin for 1866, our Consul drew attention to the fact that the increase in the importation of opium in that and the previous year had been immediately preceded by an Imperial edict, issued on the 28th April, 1865, which prohibited the cultivation of the poppy throughout the empire. He stated that though, at first, the operation of this edict was beneficial to the trade in foreign opium, the poppy was still grown extensively, and the prohibition would prove ineffectual. That such has hitherto been the result is proved by the fact of another edict having been issued on the 31st January, 1869, redirecting all viceroys and governors to cause proclamations to be issued, forbidding altogether the cultivation of the poppy, which is stated to have been introduced from Kan-suh into Shen-si and Shan-si, and afterwards grown in the provinces of Kiang-su, Honan and Shan-tung. The ground of objection to the poppy, and even to potato culture, stated in the edicts, is that they withdraw land from the cultivation of rice and grain.

There is little doubt that the competition of native-grown opium has had much to do with the declining price of the foreign-grown since 1866, and that at the same time the increased production of the native has lessened the importation of Indian opium.

At Tien-tsin, since 1866, it is certain that a yearly diminishing importation has accompanied a yearly falling price, plainly indicating a decreasing demand for foreign opium. There is no evidence, however, according to Mr. Consul Mongan, of the decrease of opium smoking, but rather of its increase; and therefore it may fairly be inferred that the quantity of native opium has so much increased, or its quality so much improved of late, as to have shut out a considerable amount of the Indian drug. This inference, too, is much strengthened by the reference which the late edict makes to the spread of poppy culture over northern China.

In addition to the provinces enumerated in the edict, there is also ample evidence of extensive poppy cultivation in other parts of the Chinese empire. It seems to have been carried on for many years in the extreme south-west in the province of Yunnan, the largest portion of which has thrown off its allegiance, and is now a practically independent kingdom.

Sze-chuen has also been for many years a great poppy province, and the drug produced there very perceptibly affects the market at Hankow. When Lord Elgin visited that city in 1858, he stated (Blue Book, 1859, page 443) that he saw there "shops where native opium was openly advertised for sale." Mr. T. T. Cooper, in some notes on his travels towards India through Central China, speaking of Sze-chuen, says, "In spring the country was white with the flower of the opium poppy, now one of the staple productions of the province;" and Mr. A. Wylie, the well-known Sinologue, who has travelled lately in the same province, says in a letter, "One fact I can vouch for, and that is the widespread use of the drug, and consequent degradation of the people. It was pitiable to see the victims of this practice coming to us to ask for relief and desiring to be cured, and such were by no means confined to the lower classes. I believe the practice in Sze-chuen, as elsewhere, is very widespread among the literary and governing class. From all the information we could gather, it commenced in this province within twenty or thirty years past. In the 'Statistical Account of Sze-chuen,' published in 1817, which gives a detailed list of the productions of the province, the poppy is not named. I do not remember seeing any foreign, though it is sold there, but at every market the farmers bringing in their little lumps of native production were always to be met with. As far as I could learn, the price ranged from 140 to 250 cash the tael weight."

Another vast region, not mentioned in the edict of 1869, in which poppy culture has been spreading rapidly within the last few years, is Eastern Mongolia and Central and Northern Manchuria, the drug thence brought down to the coast competing with Indian opium in the Newchwang market. Thus, in the provinces of Yunnan, Sze-chuen, Shen-si, Kansuh, Shan-si, Honan, Shan-tung and Kiang-su, as well as in Manchuria and Mongolia, native opium is produced; and that its consumption by the Chinese is lessening the demand for the Indian drug, would seem to be indicated by the fact that in 1868 the total importation of the latter was less than it had been in 1867 by 4789 chests, representing a value, at the average ruling rate, of nearly two millions sterling.

These figures are given in a letter that was published in the *North China Daily News* of the 22nd February, 1869.

Native opium sells in Tien-tsin at from 125 taels to 200 taels per picul less than Indian, and though nominally prohibited, it pays a similar local duty to foreign. Opium is brought into Tien-tsin either crude or prepared. When in the former state it is generally spoken of as "tu," earth or clay, from its outward resemblance to lumps or cakes of common clay: and the native, as distinguished from the foreign, which is termed "yang-tu," or foreign earth, is called "hsi-tu," or western earth—a name that has clearly a geographical reference to the producing provinces. (Consular Reports, No. 2, 1869.)

Prepared opium, called "ya-pieu-kao," is generally composed of foreign and native drug boiled down, and often largely adulterated by an admixture of various glutinous substances, and amongst the rest by a decoction of the berries of a leguminous tree called the "huai-shú," which grows abundantly in the province.

Before concluding, I may give a few figures showing the imports and consumption of opium in the United Kingdom. Opium imported and used in this country:—

	Imports. lb.	Consumption. lb.
1830	209,076	22,668
1845	259,644	38,229
1850	126,318	42,324
1855	50,143	34,473
1860	210,867	112,795
1865	401,571	225,571

The Board of Trade returns for the last two years are, of course, not yet issued.

The largely increased imports and consumption, unless a greater home stock is held, would give ground to the opinion that opium is beginning to be used somewhat extensively for other than medicinal purposes.

In 1858 we imported but 82,085 lb., and retained for consumption 77,639 lb. In 1868 we imported (nearly all from Turkey) 322,309 lb. and re-exported 123,965 lb., thus leaving 198,344 for home consumption. The reshipments are principally to Holland, the United States, New Granada and the West Indies. In the latter countries it is evidently destined for consumption by the Chinese.

NEW REMEDIES.

The following extracts from a recent lecture by Dr. B. W. Richardson will probably be of interest to pharmacists:—

Nitrite of Amyl.—The physiological action of nitrite of amyl is directly exerted on the ganglionic nervous tract; it paralyses so that the nervous supply over the extreme vascular system is impaired; if the effect be sustained, the muscular system generally is thrown into relaxation. The observation of this effect of the nitrite has led Dr. Richardson to suggest it primarily as a remedy for excessive spasmodic action,—for tetanus specially,—and it has been applied in that direction with much success. Lately, Mr. Foster, of Huntingdon, has administered the nitrite with complete success in a case of traumatic tetanus,—holding the convulsions in check for the long period of nine days. The nitrite is best administered by inhalation, five minims on a piece of folded linen or handkerchief being the dose for an adult. It will act if given by the mouth; but as the action is very energetic, and requires to be kept under the control of the administrator, it is much safer administered by inhalation. In tetanus, the periods of recurrence of the spasmodic attacks should be carefully watched, and, when the paroxysm is threatened, the inhalation of the nitrite should commence, so as to subdue the spasmodic seizure. The agent has been administered also with success in spasmodic angina, asthma and colic.

The action of the nitrite is curative only in so far as it controls the spasm,—that is to say, it prevents death, and so leaves time for recovery. Dr. Richardson has observed that frogs under strychnine tetanus are immediately relieved of spasm by nitrite of amyl, and that, with great care in keeping the animals free of spasm, they can be sustained until the strychnine is removed from the body, when there is recovery; in this explanation he defines the true place of the nitrite as a remedy. In tetanus the administration of the nitrite is not to be considered as displacing other rational means of cure. On the contrary, it favours other means; it enables food to be freely supplied, it gives time for the action of purgatives and diuretics, or for the employment of the hot-air bath.

Caustic Ethylates.—The ethylates are crystalline substances, in which one atom of hydrogen of absolute alcohol is substituted by one of potassium or of sodium. Brought into contact with the body, the ethylates at first produce no action, but as they pick up water from the tissues they are decomposed, the potassium or sodium is oxidized, yielding caustic potassa or soda in the fresh state, while alcohol is reformed from the recombination of hydrogen derived from the water. Dr. Richardson proposes the employment of these ethylates as caustics. He believes they will be found to be the most effective and manageable of all caustics; and that in cases of cancer, when it is desirable to destroy structure without resorting to the knife, and in cases of nævus and other simple growths, they will be of essential service. The ethylates can be held in solution with alcohol in various degrees of strength; the solution can be applied with a glass brush or injected by the needle, and a slow or quick effect can be ensured, according to the wish of the operator. The ethylate of potassium is the most active agent.

Triethylic Ether.—When the ethylate of sodium is acted upon by chloroform, the chemical action which takes place is very fierce, and great care is required to secure a fair product. The chlorine of the chloroform combines with the sodium of the ethylate to form chloride of sodium, and triethylic ether remains. As chloroform contains three atoms of chlorine, each single part of chloroform decomposes three parts of ethylate of sodium. Thus:—3 (C_2H_5NaO), ethylate of sodium; $CHCl_3$, chloroform $= 3\,NaCl$, chloride of sodium, and $C_7H_{16}O_3$, triethylic ether.

The ether is a heavy, aromatic, ethereal fluid, having a vapour density of 74, a specific gravity of ·896, and a boiling-point of 145° C., 297° F. It acts much like alcohol physiologically. Dr. Richardson has lately used it as a menstruum of ethylic ether for general anæsthesia. The ethylic ether carries over with it, in evaporation, sufficient of the heavier ether to form a compound vapour which is very pleasant to breathe and equable in action. He has administered this compound twice for operations on the eye,—once while Mr. Brudenell Carter operated for strabismus, and once while Mr. Walker, of Liverpool operated for cataract. The anæsthesia in both cases was perfect. The ether also forms an excellent mixture with bichloride of methylene; and if mixtures of anæsthetic substances were satisfactory scientific applications, it might be brought into extensive use. Dr. Richardson accepts it, however, rather as an index of the way than of a resting-place. He looks for a simple ether which shall have the full and safe qualities of the mixture, together with perfect stability. There is, in truth, already another ether, called trimethylic, made by acting on methylate of sodium, CH_3NaO, with chloroform; the product being 3 (Na Cl), common salt, and $C_4H_{10}O_3$, trimethylic ether. But this ether, which has a vapour density of 53, and a high boiling-point, is not quite, though it approaches, the substance required.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

(*Concluded from page* 344.)

Acidum Sulphurosum.—Strong sulphuric acid is heated with charcoal, and the resulting mixture of gases conducted by suitable tubes, first through a small quantity of water to free it from impurity, then into the water in which the sulphurous acid gas is to be dissolved.

$$2H_2SO_4 + C = 2H_2O + 2SO_2 + CO_2.$$

From this equation, it appears that the sulphurous acid gas evolved is mixed with half its volume of carbonic acid gas. The latter escapes.

Sulphurous acid gas may be made in many other ways.

By burning sulphur,—$S + O_2 = SO_2$.

By the action of undiluted sulphuric acid on many metals, as on copper and mercury,—

$$2H_2SO_4 + Cu = CuSO_4 + 2H_2O + SO_2.$$

By boiling sulphur with sulphuric acid,—

$$2H_2SO_4 + S = 2H_2O + 2SO_2 + SO_2.$$

Compare this with the action of carbon.

Or by the action of acids on sulphites or hyposulphites.

Sulphurous acid gas, sometimes called sulphur dioxide, is not an acid, but, like other anhydrides, generates an acid when united with water.

$$\underset{\text{Sulphurous acid gas.}}{SO_2} + H_2O = \underset{\text{Sulphurous acid.}}{H_2SO_3}.$$

It is a pungent gas, condensable to the liquid state by application of cold or pressure; soluble in water;* the gas in a moist state, as well as the solution, possessing the power of bleaching organic colours. With sulphuretted hydrogen the solution gives a deposit of sulphur with formation of water and pentathionic acid.

$$SO_2 + 2H_2S = 2H_2O + S_2$$

and

$$5SO_2 + 5H_2S = 4H_2O + S_5 + H_2S_5O_6.$$

The most delicate test for sulphurous acid and sulphites has been described under *Acidum Aceticum.* The solution, by exposure to the air, absorbs oxygen, and is soon converted into sulphuric acid. If fresh it gives no precipitate, or but a very slight one, with $BaCl_2$, but a copious one if solution of chlorine be also added. In the latter case sulphuric acid is formed.

$$H_2SO_3 + OH_2 + Cl_2 = H_2SO_4 + 2HCl.$$

Sulph*ite* of barium is soluble in acids, sulph*ate* not so. Iodine does the same when the liquid is sufficiently diluted.

$$H_2SO_3 + OH_2 + I_2 = H_2SO_4 + 2HI.$$

It must not be overlooked that in more concentrated solutions the reaction goes the other way, *e. g.*,

$$2KI + 2H_2SO_4 = K_2SO_4 + I_2 + 2H_2O + SO_2.$$

The strength of sulphurous acid solutions is to be tested by the volumetric solution of iodine. The reaction has just been shown. As soon as the whole of the SO_2 has been changed into H_2SO_4, the next drop of iodine which is superadded remains in the liquid unchanged, and therefore forms with the starch previously added its characteristic blue compound. When this point is reached the dropping in of the iodine is stopped.

3·47 grams of the official sulphurous acid require for complete oxidation 100 c.c. of the vol. sol. of iodine. 1000 c.c. of the vol. sol. contain $\frac{1}{10}$ of an atom of iodine, or 12·7 grams; 100 c.c. therefore contain $\frac{1}{100}$ of an atom, which, according to the equation already given, is sufficient for $\frac{1}{200}$ molecule of SO_2, or ·32 gram. This would be the quantity in 3·47 grams of the solution; it is equivalent to 9·2 per cent.

3·47 : 100 as ·32 : 9·2.

* It is proposed to employ a 5 per cent. solution, there being a little difficulty in preparing a liquid of the official strength as a commercial article.

THE CITRATES OF THE U.S. PHARMACOPŒIA.

BY C. LEWIS DIEHL.

(*Concluded from page* 346.)

Citrate of Iron and Quinia.—The formula of the United States Pharmacopœia for this preparation is as follows:—

Solution of citrate of iron 10 fl. oz.
Sulphate of quinia 1 troy ounce.
Diluted sulphuric acid.
Water of ammonia.
Distilled water, each, a sufficient quantity.

"Triturate the sulphate of quinia with six fluid ounces of distilled water, and having added sufficient diluted sulphuric acid to dissolve it, cautiously pour into the solution water of ammonia, with constant stirring, until in slight excess. Wash the precipitated quinia on a filter, and, having added to it the solution of citrate of iron, maintained at the temperature of 120° by means of a water-bath, stir constantly until it is dissolved. Lastly, evaporate the solution to the consistence of syrup, and spread it on plates of glass, so that, on drying, the salt may be obtained in scales. In thin transparent scales, varying in colour from reddish-brown to yellowish-brown, with a tint of green, according to the thickness of the scales. Its taste is ferruginous and moderately bitter. It is slowly soluble in cold water, more readily so in hot water, but insoluble in ether and officinal alcohol. Ammonia, added to the aqueous solution, deepens its colour to reddish-brown, and causes a whitish curdy precipitate of quinia; but no sesquioxide of iron is thrown down."

The solubility of this compound is so excessively sparing, even when heat is applied to favour it, that it is a question whether its medicinal efficacy is not impaired thereby. There exists no particular difficulty in preparing a handsome article when the directions of the Pharmacopœia are followed. But these directions are liable to the same objections as specified previously with regard to solutions of citrate of iron, as a good result is dependent entirely upon the accurate attention given to the preparation during the process of heating; for if the heating reaches a certain point of temperature higher than directed when the quinia is being dissolved, it is apt to agglomerate into masses which are very unmanageable and difficult to dissolve. The difficulty may be obviated by triturating the properly precipitated and washed quinia with a portion of the solution of citrate of iron, introducing it into a flask, and then adding the remaining solution. By occasional agitation, the quinia dissolves in a short time, forming a clear solution, which may be concentrated on a water-bath without paying any special attention to temperature, and will scale with perfect facility. But by far the more popular salt is the *ammonio-citrate of iron and quinia*, which appears to have replaced the officinal compound almost entirely. This may be prepared successfully by reserving about one-sixteenth of the solution of citrate of iron and quinia, obtained as above, and adding to the remaining fifteen-sixteenths, contained in a flask, dilute aqua ammoniæ in fractional portions, until a permanent precipitate results. Upon each addition of ammonia, quinia is copiously precipitated, but it re-dissolves readily by agitation until toward the end of the process, when it will dissolve more slowly, and care must be exercised to avoid an undesirable excess of alkali. The addition of the reserved one-sixteenth of solution will, by careful manipulation, redissolve the precipitate formed; and the solution, which in this instance may be evaporated to the consistence of treacle on an ordinary water-bath, without special care as to temperature, will, when spread upon glass plates, form fine scales of a handsome garnet colour, of perfect and rapid solubility and only moderate deliquescence.

Solution of the Soluble Citrates.—An expeditious method of dissolving the soluble scaled preparations is to place the salt in a mortar, add just sufficient water to cover it, allow it to stand a minute or two, then gently triturate the mixture with a pestle, when perfect solution will result. If it is attempted to dissolve the salts by direct trituration with water, they will adhere to the pestle and sides of the mortar and greatly delay the operation.

Pills of the Soluble Citrates.—These may be conveniently and expeditiously prepared by adding from ten to fifteen per cent. of finely powdered elm-bark, and forming a mass by the aid of glycerine, which appears to exercise just sufficient solvent power to effect proper cohesion. A plastic mass is obtained, which does not harden rapidly, and is readily rolled into pills.

GLYCERINE IN BEER AND WINE.

The demonstration by Pasteur, ten years ago, and later by Nessler, Pohl and others, of the natural presence of glycerine in fermented liquors, gave rise to an advantageous process for the improvement of wines. It was also inferred that a certain admixture of glycerine with beer would improve its quality. A series of experiments were made. Several kinds of celebrated beer, from Dresden, Culmbach, Bohemia and Erlangen, were analysed. In all these beers glycerine could be detected, in none in less proportion than ·02 per cent., while in the Erlangen beer it rose to ·09 per cent. This proves that in wort, besides the conversion of the sugar (glucose) into alcohol and carbonic acid, another form of fermentation, the so-called succinic fermentation, sets in, by which a part of the glucose is converted into succinic acid and glycerine; glycerine being a constant constituent, influencing, and in fact determining to some extent the quality of the beer.

Glycerine is employed for the improvement of wines made from inferior grapes, the juice of which, being deficient in sugar, can never yield a sweet wine. It is preferable to sugar for the purpose, as although sugar is cheaper, it would produce a second fermentation, which is not wanted.

The extent to which glycerine is employed to improve wines cannot be demonstrated, as no wine merchant will admit that he uses it; but in western Germany the makers of purified glycerine send their travelling agents not only to the wine merchants, but to the wine farmers themselves, so that the former buy already improved wine, and need not therefore add any more glycerine. Experiments have proved that what thus improves wine will do no harm to beer. Beer containing but little glycerine has had 1 per cent. of glycerine added to it, effecting a great change in taste and fulness. Glycerine added directly to the wort will not interfere in any way with the manipulation or processes of brewing.

In the preparation of a full beer that will keep without being too bitter, glycerine may be used instead of sugar to counteract the bitterness with advantage, as it does not prolong the fermentation and clearing as sugar does. Glycerine is not readily volatile, but in a boiling liquid it passes over with the vapour of water. For this reason it should be added after the wort has become cool and before it goes into the fermenting-tubs. One or two pints of it may be used to every hundred quarts of beer, according to the quality of the hops used. One pound of glycerine represents two pounds of malt extract, or three and one-third pounds of malt, which accordingly may be reduced in quantity.—*New York Druggists' Circular.*

IODIDE OF CALCIUM, AND SYRUP OF IODIDE OF CALCIUM.*

BY OTTMAR EBERBACH.

Having had occasion to use the chemical specialities called iodide of lime and syrup of iodide of lime, and finding that the articles sold under these very unchemical names were not simple chemical combinations (as for example, iodide of iron or syrup of iodide of iron), but mixtures, the former a mechanical mixture of iodine and quicklime, the latter of the two distinct chemical combinations called iodide of calcium and iodate of oxide of calcium, and being desirous to obtain a preparation in strict accordance with the title,—the author investigated the matter, with the following results:—

The preparation called iodide of lime is a mechanical mixture of iodine and quicklime which, when put into hot water, undergoes a chemical reaction, forming iodide of calcium and iodate of the oxide of calcium, as illustrated by the following equation:—

$$6\,CaO + 6I = 5\,CaI + CaO\,IO_5.$$

These combinations are both contained in the so-called syrup of iodide of lime. To prepare the iodide of calcium free of the iodate of oxide of calcium, the most practical method is as follows:—prepare first a solution of the protoiodide of iron, by mixing iodine with a small excess of iron and sufficient water; let this stand until the solution assumes a pale green colour; filter, and add to the filtrate one-third as much iodine as had been used to make the solution of protoiodide of iron; heat to the boiling-point, and add sufficient milk of lime to precipitate all of the iron, which precipitates in the form of Wœhler's granular magnetic oxide of iron, according to the following equation:—

$$FeI + Fe_2I_3 + 4\,CaO = FeO.Fe_2O_3 + 4\,CaI.$$

To obtain the iodide of calcium, filter the solution and

* From the *Michigan University Medical Journal.*

evaporate the filtrate with the exclusion of air, as carbonic acid has the tendency to decompose it. It crystallizes in the form of needles; by evaporating to dryness it forms a white fusible mass. It is soluble in alcohol, very deliquescent, and decomposes when fused in contact with air, forming oxide of calcium and free iodine. To make the syrup of iodide of calcium, the following formula is proposed. Take of—

Iodine	4 oz.
Iron (in form of wire)	7½ dr.
Distilled water	q. s.
Milk of lime (fresh)	q. s.
Sugar	28 oz.
Simple syrup	q. s.

Mix 3 oz. of the iodine with the iron and 4 oz. of water, in a thin flask with long neck; shake occasionally until the reaction has ceased and the solution assumes a pale green colour; filter the solution and add the remainder of iodine; heat to the boiling-point, and add milk of lime until all of the iron is precipitated; filter and wash the precipitate with hot water until all the iodide is washed out, then bring the whole to the measure of 20 oz.; add the sugar and dissolve by a gentle heat; to the solution add enough simple syrup to make it measure 40 oz.; mix thoroughly, and fill into 2 oz. bottles, well corked.

The syrup is a transparent, colourless liquid, which does not tinge starch paper blue. Mixed with sulphuric acid it gives a white precipitate of sulphate of oxide of calcium and turns the supernatant liquid brown, which, by heating, emits violet vapours of iodine.

THE MULLEIN PLANT.

The Mullein (*Verbascum Thapsus*) is a biennial plant, with a straight, tall, stout, woolly, generally simple stem, occasionally with one or two branches above, winged by the decurrent bases of the leaves, and from three to five feet high. The leaves are alternate, oblong, acute, rough and densely tomentose on both sides. The flowers are a golden yellow colour, rotate, nearly sessile, and are arranged in a dense, spiked, club-shaped raceme; calyx five-parted and downy; corolla five-lobed, rotate.

Mullein is common in the United States, growing in recent clearings, along the sides of roads, in slovenly fields, etc., flowering from June to August. Some botanists consider it to have been introduced from Europe. The leaves and flowers are the parts used. They have a faint, rather pleasant odour, resembling that of a mild narcotic, and a somewhat bitterish, albuminous taste, and yield their virtues to boiling water. Mullein is demulcent, diuretic, anodyne and anti-spasmodic. The infusion is useful in coughs, catarrh, hæmoptysis, diarrhœa, dysentery and piles. Its diuretic properties are rather weak, yet it is very useful in allaying the acridity of urine which is present in many diseases. It may be boiled in milk sweetened and rendered more palatable by the addition of aromatics, for internal use, especially bowel complaints. A fomentation of the leaves also forms an excellent local application for inflamed piles, ulcers and tumours. The leaves and pith of the stalk form a valuable cataplasm in white swellings, and infused in hot vinegar or water, it makes an excellent poultice to be applied to the throat in cynache tonsillaris, cynache maligna, and mumps. The seeds are said to pass rapidly through the intestines, and have been successfully used in intestinal obstructions. They are narcotic, and have been used in asthma, infantile convulsions and to poison fish. The infusion may be drunk freely. The flowers, placed in a well-corked bottle and exposed to the sun, are said to yield an excellent relaxing oil.—*New York Druggists' Circular.*

DARWINISM IN CHEMISTRY.

A writer in the *Medical Times and Gazette* asks the question whether the groups of elements which resemble each other so strangely can be composed of isolated species of matter, or whether they are not rather formed of individual members of a family having a community of origin? Towards the elucidation of this subject he brings forward the following statements:—

The existence of natural families of elements has long been recognized by chemists. Chlorine, bromine and iodine form one such family; potassium, sodium and lithium (to which the metals cæsium and rubidium have been added by Bunsen's spectrum analysis) constitute another. The group barium, strontium and calcium, as also the group magnesium, zinc and cadmium, are well recognized. There is also the very extensive nitrogen family, comprising nitrogen, phosphorus, arsenic, antimony, vanadium, bismuth, boron and some others. Then there is the carbon family, comprising carbon, silicon and tin. Oxygen, sulphur and tellurium form a group. Lastly, there is the singular group comprising aluminium, chromium, manganese, iron, nickel and cobalt. The place of the metal copper is difficult to assign; silver likewise presents difficulties. Hydrogen is placed by some in the chlorine family, but is commonly taken to belong to the potassium family; in short, nearly every element has been assigned to one or other natural family. In the first-mentioned example, viz. chlorine, bromine and iodine—the family likeness is not in the obvious physical characters of the elements themselves: chlorine is a greenish-yellow gas under ordinary atmospheric pressure and temperature; bromine is a brownish-red liquid; iodine a dark crystalline solid, yielding violet vapour on being heated. Many compounds of these elements, however, require analysis to distinguish them. Hydrochloric acid, hydrobromic acid and hydriodic acid are colourless gases, very strongly fuming in moist air, and very soluble in water. They need to be subjected to some chemical test, or else to have their density determined in order to become distinguishable. Again, chloride, bromide and iodide of potassium are very much alike.

There is also a close parallelism between the possible combinations of chlorine, bromine and iodine with other elements. Thus, there are the chloride, the bromide and the iodide of potassium or of sodium, etc. Chloride of ethyl is represented by bromide and iodide of ethyl, and chloroform finds its analogues in bromoform and iodoform. But the parallelism, although close, is not absolute. Thus, there appear to be more oxides of chlorine than of iodine. The chloride of copper does not appear to have an iodine representative; and probably there are many complex organic chlorides which admit of no corresponding iodides; inversely, compounds of iodine, with iodides of the compound ammoniums, seem to be unrepresented by corresponding chlorine compounds.

In the second group—that of the metals potassium, sodium, and lithium—there is in their compounds a resemblance very often so close that chemical analysis has to be called in to distinguish whether there be potassium, sodium, or lithium in the compound. There is, again, the closest parallelism between the possible compounds of these metals. Not a single potash-salt of any one of the thousands of possible acids but has its fellow sodium-salt. The only breaches of the parallel that occur to the writer are in the oxides of the metals and in the degree of hydration of the salts—potassium- and sodium-salts taking up different numbers of atoms of water of crystallization; the individual uncombined members of the potassium group present also a physical similarity. All are solids under ordinary conditions; potassium and sodium having very nearly the same melting and boiling points.

Between the chemical equivalents of the different members of a natural family some very curious and interesting relations have been traced. Thus, the equivalents of potassium, sodium and lithium are, respectively, 39·1, 23 and 7. Now, 23 is the exact arithmetical mean between 39 and 7; and in energy and general resemblance sodium is the mean of potassium and lithium. The equivalents of the members of the chlorine group exhibit a somewhat similar relationship, only not so precisely. They are 35·5, 80·0 and 127·0, the middle one not being quite the arithmetical mean. Barium, strontium and calcium afford a similar example, viz. 68·5, 43 and 20 respectively. In the potassium group the highest equivalent and highest energy go together; in the chlorine group the least equivalent is joined to the highest energy (chlorine being more energetic than bromine, and bromine more energetic than iodine); in the barium group the order is curious, viz. highest equivalent with highest energy (barium); next, intermediate equivalent with lowest energy (strontium); and last, lowest equivalent with intermediate energy (calcium).

A suggestive relationship subsists between the *equivalents* of oxygen and sulphur, chemical fellows with strongly-marked resemblances, whose equivalents bear to one another the exact ratio of 1 to 2.

Lastly, nickel and cobalt offer a marvellous case of resemblance. Chemically, they are almost indistinguishably alike in their compounds; physically, they are like one another as isolated elements; and their equivalents are absolutely identical, so far as the most accurate determinations have been able to show.

Postal Cards and Sympathetic Ink.—The introduction of the halfpenny postal-cards, with the direction on one side and the correspondence on the other, has given interest to the subject of sympathetic ink. One of the best-known kinds of sympathetic ink consists of a weak solution of chloride or nitrate of cobalt. Writing executed with such a solution is invisible until it is warmed, when it appears green or bluish, disappearing on exposure to moist air; the explanation being, that the anhydrous chloride and nitrate of cobalt are deep green or bluish, whilst the hydrated salts are very pale pink—invisible in small quantities of salt. If, instead of chloride or nitrate, acetate of cobalt containing a little nitre be used, then the writing will come out in pale rose-coloured characters, visible whilst warm and invisible when cold. Another variety of sympathetic ink consists of weak infusion of galls. To render the writing visible, it must be dipped into solution of an iron-salt, the common sulphate or green vitriol answering the purpose very well. Yellow prussiate of potash, dissolved in water, also makes an ink which becomes visible on treatment with persalts of iron. A great number of possible solutions will at once suggest themselves to the chemist; thus the writing might be done with acetate of lead and rendered visible by means of a solution of sulphuretted hydrogen. No doubt basic acetate of lead would be superior to neutral acetate for such a purpose. Most, and possibly all, kinds of sympathetic ink give writing which becomes more or less visible when the paper written upon is very strongly heated, to the point of becoming slightly burnt. Some of the solutions which are sometimes recommended as sympathetic ink, as, for instance, solutions of silver and gold, are very unsatisfactory, becoming visible on exposure to the light. Hence, many sympathetic inks are little to be relied on, and the safest are those, such as the basic acetate of lead, which require a special solution for their development.—*British Medical Journal.*

Explosion of Naphtha.—On Wednesday evening, Oct. 26, while a party of men on board H.M.S. Hercules were lowering a cask containing Hay's Patent Anti-Fouling Composition into the carpenter's store-room, it fell from the slings, and bursting, its contents ran over the deck. Some men were sent to clean the deck, who took with them two lamps. The vapour of the naphtha used in the composition coming in contact with the lights caused an explosion, which was followed immediately by a second, the flame on each occasion rising through the hatchway to the upper deck. Upon descending into the storeroom, where the effluvium was most overpowering, it was found that six men were severely, and three slightly, burned. As a quantity of the liquid had reached the "double bottom" under the store, both compartments were, as soon as possible, flooded with water, to prevent the possibility of a fire breaking out.—*Standard.*

Poison of Acorns.—Sir George S. Jenkinson has written a letter to the *Times*, stating that in the neighbourhood of his seat at Eastwood Park, Berkeley, Gloucestershire, the cattle are dying by scores from having eaten too many acorns which had fallen during the late gale. If once a beast is taken ill nothing seems to have any effect on the inflammation which ensues, death following more or less quickly in each case. The poison affects the intestines, blackening and rotting away the mucous membrane. He says that it is only the cattle that have been out and eaten largely of the acorns that are affected.

Preserved Meat.—It is well known that meat preserved in tins by the ordinary process of heating in a chloride of calcium bath for a prolonged period and then closing the orifice, is surrounded by jelly, which, with most of its juice, has been extracted from the meat, leaving a tasteless and exhausted fibre. To obviate this objection a method has been adopted by Mr. Richard Jones, in which the steam is exhausted from each tin by a tube connected with a vacuum chamber, the meat being thus dried with its juices left in their natural place amongst the muscular substance, while the whole process can be effected at a lower temperature, and with less injury to the flavour and appearance of the meat.

Local Applications to Burns.—Dr. A. D. Binkerd, writing in the Philadelphia *Medical and Surgical Reporter* (July 9th, 1870), prefers, as an application to burns when first seen, carbolic acid and glycerine, in the proportion of from 5 to 10 drops of the former thoroughly incorporated with 2 ounces of the latter, spread on with a camel's-hair or other light brush, then a layer of raw cotton, over which a roller-bandage is neatly adjusted. For the suppuration following burns he recommends the following dressing:—Yellow wax, melted and strained, ℥i; raw linseed-oil ℥iij; tannin ʒi; subnitrate of bismuth, gr. xx. The wax must be first melted, the oil then added, and the whole stirred until incorporated; next, the tannin is added, and lastly the bismuth. The ointment should be applied on pieces of lint.

Adulteration of Catechu.—It is a well-known fact that catechu is often adulterated; the sophisticated substance injuriously affecting various operations in which it is employed, especially dyeing and calico-printing. According to Tissandier, genuine catechu, when exhausted by means of ether, loses 53 per cent. of weight, leaving, after drying, 47 per cent. of residue. A mixture of catechu and alum gives a white precipitate with nitric acid and with chloride of barium.

Solvent for the Ear Wax.—After a series of experiments made by Dr. Petrequin, of Lyons, in which he tried successively olive oil, glycerine and oil, alcohol and olive oil, olive oil and oil of turpentine, ether, alkaline solutions, soap and water, chloroform, sulphuret of carbon, etc., he has arrived at the conclusion that the old remedy of tepid water is the best for the purpose.

Antidote to Carbolic Acid.—Sweet oil or castor oil swallowed in large quantities are recommended as the most efficient antidotes to carbolic acid, when it has been taken in poisonous doses.

New Application of Chloral Hydrate.—A writer in the *Lancet* reports that he has used chloral hydrate combined with chloric ether successfully in severe cases of diarrhœa.

The Pharmaceutical Journal.

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THE ELECTION OF ANNUITANTS.

IN another column our readers will find particulars of the election of two more annuitants on the Benevolent Fund, raising this class of recipients to the number of twelve. By the passing of the Pharmacy Act of 1868, the advantages of the fund were thrown open, as many of our readers know, to the whole class of chemists and druggists, instead of being restricted, as was the case before that period, to members of the pharmaceutical body.

Though the number of applicants for temporary and permanent relief is increasing annually, we are surprised to notice that the amount of subscriptions and number of individual subscribers are decreasing. This apathy on the part of the large majority of the trade is much to be regretted, and we hope, for the sake of our cloth, will not be allowed to continue. A body of men, mustering somewhere about 10,000, should, without much special pleading, be able to provide assistance for the whole of its distressed members, and for all the widows and orphans having a claim upon it.

If every chemist and druggist were to subscribe five shillings yearly, the directors of the fund would have a revenue approaching the necessities of the charity; and we commend this suggestion, in all sincerity, to those who have not hitherto made it their practice to subscribe. It is painful to notice how frequently the most skilful and highly endowed men become unfortunate in business; and we only allude to the circumstance to quicken the sense of responsibility which, in our opinion, devolves upon every registered chemist and druggist, that of contributing annually, as a *matter of duty*, at least *some* amount towards the relief of his distressed brethren.

SOME time since, we noted the serious illness of Dr. ANDERSON, and we have now the sorrowful task of recording his death.

WE are glad to state that at the moment of going to press permission has been received from the Post-Office for the posted copies of the Journal to be cut.

Proceedings of the Pharmaceutical Society.

BENEVOLENT FUND.

ELECTION OF ANNUITANTS.

A meeting was held at the house of the Society on Friday, the 28th October, pursuant to notice, for the ELECTION OF TWO ANNUITANTS on this Fund, each to receive Thirty pounds; Mr. A. F. HASELDEN, Vice-President, in the chair.

Four applicants remained on the list of Candidates approved by the Council for Election.

Scrutineers were appointed from the voters present, who, after examining the votes, presented the following report:—

"We, the undersigned scrutineers, appointed at the sixth election of annuitants on the Benevolent Fund of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following result:—

	No. of Votes.	Brought forward.	Total.
Hannah Greaves	1982	739	2721
Charles Thomas Anderson	1715	787	2502
John Watkins	929	763	1692
Sarah Wilson	623	91	714

"Signed,

JOHN BRADLEY. H. F. GROVES.
I. BOURDAS. FREDERICK ANDREWS.
CHARLES E. TURNER. WILLIAM A. TILDEN.
CHARLES COLES. T. H. HOLLOWAY."

Votes polled for unsuccessful candidates are carried forward.

PHARMACEUTICAL MEETING.

Wednesday, November 2nd.

The Chair was taken by Mr. HASELDEN, Vice-President.

The SECRETARY having read the minutes of the previous meeting, announced the following donations to the Library and Museum:—

Calendar of the Royal College of Surgeons for 1870: from the College,—Transactions of the Clinical Society, vol. iii.: from the Society,—Specimen of Bauxite (aluminate of iron) used as a source of aluminium,—Specimen of Cryolite: from H. B. Brady, Esq.,—Specimen of falsely-packed Chiretta: from Mr. H. S. Evans.

The following papers were then read:—

REMARKS ON A SPECIMEN OF CHIRETTA, PRESENTED TO THE MUSEUM BY MR. H. SUGDEN EVANS.

BY E. A. WEBB.

I wish to draw the attention of the meeting to the packet of chiretta upon the table, which Mr. Henry Sugden Evans has kindly presented to the Museum. It is one of a number of packages that were imported into England about a year ago. It is curious from having in the centre a package of a distinct plant, which has been first carefully tied up by itself, and then surrounded by the chiretta.

When first shown to me, I saw it must be a madder of some sort by its square, rough stems, which, as well as the roots, are red, and by its coming from India I suspected it might be munjeet, *Rubia cordifolia*. I have since had my opinion confirmed in several ways.

1st. I obtained from the stems a very fair quantity of alizarine by digesting them in strong sulphuric acid and then diluting with water, whereby the alizarine was precipitated.

2nd. I submitted a sample to Mr. Daniel Hanbury, who kindly compared it with the illustrations and descriptions he had of the plant, with which it agreed as far as the specimens would allow us to judge.

And 3rd, by his advice, I sent a sample to Mr. M. C.

Cooke, Curator of the Museum at the India Office, from whom I had the following satisfactory reply:—

"Dear Sir,—I have not the slightest doubt that your specimens are *Rubia cordifolia*. Yours most obediently,
"M. C. Cooke."

The following are, I think, the chief characters by which it may be distinguished from chiretta:—

It is a trailing plant, with an underground stem about the thickness of a quill, giving off rootlets at intervals; of a dull reddish colour externally, but brighter internally. The stems are long and trailing, quadrangular, the angles being covered with small recurved prickles. The cortical portion, when old, soon breaks off from the internal woody portion, which is round, and of a red colour like the root.

The *leaves* are about an inch and a half long, supported upon peduncles about half that length, arranged in whorls of four at the nodes, which are very conspicuous. They are 5-ribbed, with an entire or dentate margin, and generally more or less cordate.

The specimen I examined had no signs of flower or fruit upon it.

The true *Ophelia Chiretta*, on the other hand, has a thick branching root, a round, smooth brown stem, sessile amplexicaul opposite leaves, and purely bitter taste.

The reason of this false packing is I think very evident, when we know that about that time chiretta was between 2*s.* and 3*s.* a pound, while munjeet was between 4*d.* and 6*d.*

Mr. Tilden asked if Mr. Webb was sure it was alizarine he had procured from the plant.

Mr. Webb said that he had tested it with potash and in other ways, and he had no doubt of the result.

Mr. Tilden said he had thought the appearance might be due to purpurine. He was working with Dr. Stenhouse when that gentleman discovered mungistine, which presented the most magnificent crystals, in the shape of beautiful golden scales, while alizarine was not contained in *Rubia cordifolia*. It might easily be proved by boiling some in water.

Mr. Webb said, that when boiled and reprecipitated, it appeared in an amorphous condition. He had sublimed some, from which he had got crystals very similar to alizarine.

Professor Bentley said he was quite sure the meeting would agree with him that it was of great importance that such specimens as that on the table should be brought before the notice of the Society immediately they found their way into the market. Very fortunately in the present case the adulteration was so palpable that it would be at once detected, but in some cases there would be more difficulty, and, therefore, it was of importance that their attention should be called to the matter, in order that they might be on their guard. He had looked over many specimens of chiretta, but had never met with such an instance of adulteration before; indeed, according to his experience, it was a substance very little subject to adulteration, but in this case the reason assigned by Mr. Webb was evidently the correct one, and the difference in price had led to an attempt to deceive the public. He might add that he had no doubt of the plant being munjeet.

Dr. Attfield said he believed the adulteration was not nearly so manifest when the specimen was first placed in Mr. Webb's hands.

Mr. Clements drew attention to an improved atmospheric gas-stove of his manufacture, a specimen of which was placed on the table; the advantages he claimed for it being the small amount of gas burnt and the perfect combustion which took place. A gallon of water could be boiled in fourteen minutes, at the ordinary day pressure, which would support a combustion of about 8 feet per hour. The burners were made of silicate of magnesia or soap-stone; he had himself had one in use for two years and a half without its getting out of order, and Dr. Odling had also used it, and reported favourably of its capabilities. The size exhibited was sold at 15*s.*, but they were made larger if required, and might be adapted for cannel-coal gas as well as ordinary gas.

Experiments on Some of the Infusions of the Pharmacopœia.

BY J. B. BARNES.

In the two last editions of the Pharmacopœia the time for the preparation of most of the infusions has been very properly lessened, but I shall be able to show that a still further reduction in the time of making infusions can be made without detriment to the resulting product. In each separate set of operations the sample of drug employed was the same; the measuring and weighing were carefully made; each infusion, excepting that of linseed, was filtered through paper before the specific gravity was taken and the evaporation set going; the latter was made in porcelain dishes over a water bath, and the resulting extract finally dried in a water oven at 212° F. until the weight became constant.

In the following tables the results obtained are exhibited:—

Infusions of the Pharmacopœia, prepared in accordance with the Time ordered.

Infusion.		Quantity of Ingredients to half a pint of Distilled Water.	Time of Infusion.	Quantity Evaporated.	Specific Gravity.	Weight of Dried Extract obtained. Grammes.	In Grains.
Bearberry		½ ounce	Two hours	Ten fluid ounces	1·215	5·33	82·25
Buchu		½ ounce	One hour	,,	1·213	3·57	55·08
Cascarilla		1 ounce	One hour	,,	1·211	2·74	42·28
Cinchona		½ ounce	Two hours	,,	1·210	1·94	29·93
Cusparia		½ ounce	Two hours	,,	1·210	3·05	46·45
Digitalis		30 grains	One hour	One pint	1·208	1·07	16·51
Dulcamara		1 ounce	One hour	Ten fluid ounces	1·215	5·13	79·16
Gentian	Gentian root	60 grains	One hour	,,	1·215	2·26	34·87
	Orange peel	60 grains					
	Lemon peel	¼ ounce					
Hop		½ ounce	Two hours	,,	1·213	2·79	43·04
Linseed	Linseed	160 grains	Four hours	,,	1·210	1·28	19·75
	Liquorice root	60 grains					
Rhatany		½ ounce	One hour	,,	1·210	2·16	33·33
Rhubarb		¼ ounce	One hour	,,	1·211	2·71	41·82
Senega		½ ounce	One hour	,,	1·213	3·69	56·93
Senna	Senna	1 ounce	One hour	,,	1·223	9·08	140·12
	Ginger	30 grains					
Serpentaria		½ ounce	Two hours	,,	1·209	·71	10·95
Valerian		120 grains	One hour	,,	1·210	1·91	29·47

Infusions of the Pharmacopœia **NOT** *prepared in accordance with the Time ordered.*

Infusion.	Quantity of Ingredients to half a pint of Distilled Water.	Time of Infusion.	Quantity evaporated.	Specific Gravity.	Weight of dried Extract obtained. Grammes.	In Grains.
Bearberry	½ ounce	One hour	Ten fluid ounces	1·215	5·35	82·56
		Half an hour		1·213	2·82	43·51
Buchu	½ ounce	Half an hour	,,	1·213	3·55	54·78
Cascarilla	1 ounce	Half an hour	,,	1·211	2·73	42·12
Cinchona	½ ounce	Half an hour	,,	1·210	1·96	30·24
Cusparia	½ ounce	One hour	,,	1·210	3·06	47·22
Digitalis	30 grains	Fifteen minutes	One pint	1·208	1·07	16·51
Dulcamara	1 ounce	Half an hour	Ten fluid ounces	1·215	5·14	79·32
Gentian { Gentian root	60 grains	Half an hour. Made with bruised root.	,,	1·216	2·85	43·98
Gentian { Orange peel	60 grains					
Gentian { Lemon peel	¼ ounce	Half an hour. Made with sliced root.	,,	1·208	2·16	33·33
Hop	½ ounce	One hour	,,	1·213	2·78	42·9
Linseed { Linseed	160 grains	Two hours	,,	1·210	1·27	19·59
Linseed { Liquorice root	60 grains					
Rhatany	½ ounce	Half an hour	,,	1·210	2·15	33·17
Rhubarb	¼ ounce	,,	,,	1·211	2·71	41·81
Senega	½ ounce	,,	,,	1·213	3·6	55·55
Senna { Senna	1 ounce	,,	,,	1·221	8·9	137·34
Senna { Ginger	30 grains					
Serpentaria	½ ounce	,,	,,	1·209	·7	10·08
Valerian	120 grains	,,	,,	1·210	1·86	28·7

Infusion of bearberry made in two hours gave 5·33 grammes extract; that which had infused one hour yielded 5·35 grammes; the infusion which had stood for half an hour gave 2·82 grammes; the conclusion is, that the one-hour infusion is as good as that which stood two hours.

Infusion of buchu, made to infuse half an hour, gave 3·55 grammes of extract, and that which stood one hour 3·57 grammes; there is no real difference.

Cascarilla infusion, made in one hour, gave 2·74 grammes of extract, and that which had stood half an hour 2·73 grammes.

Infusion of cinchona bark, prepared in one hour, yielded within two centigrammes the same amount of extract as that which had been infused for two hours; practically they are identical.

Infusion of cusparia (although the temperature of the distilled water is ordered to be at 120° F., and the time of infusion two hours) is equally strong when macerated for one hour only.

Infusion of digitalis made in fifteen minutes gave exactly the same amount of extract as that which had stood one hour.

That of dulcamara, infused for half an hour, yielded within one centigramme the same weight of extract as that which had infused one hour.

Compound infusion of gentian, made in accordance with the time and manner ordered in the Pharmacopœia, namely, one hour, and the root sliced, gave 2·26 grammes of extract; whilst when infused for half an hour, and the gentian root was *bruised*, the amount of extract obtained was 2·85 grammes; therefore there can be no doubt that it should be directed to be bruised instead of sliced. Of course, when gentian root is fresh, it is tolerably soft and can be easily sliced as thin as you please, but it is seldom met with in that state.

Infusion of linseed, which had stood for two hours, was within one centigramme as strong as the Pharmacopœia infusion, which is directed to be infused for four hours.

Infusion of hop, made in one hour, was also within one centigramme as strong as that which had stood two hours.

Infusion of rhatany, made in half an hour, yielded 2·15 grammes, whilst that which had infused one hour gave 2·16 grammes of extract.

Senega infused for half an hour gave 3·6 grammes of extract, and that of the Pharmacopœia, which stood one hour, 3·69 grammes.

Infusion of senna, made in accordance with the time in the Pharmacopœia, yielded the large amount of 9·08 grammes, that prepared in half an hour gave 8·9 grammes of extract; therefore, this is not so good as that which had stood one hour, but by a slight increase in the quantity of senna, this infusion can be made in half an hour equally as strong as the Pharmacopœia preparation.

Infusion of serpentaria, which had stood for two hours, yielded ·71 gramme of extract, whilst that made in half an hour, gave ·7 gramme.

That of valerian, made in one hour, gave 1·91 gramme of extract, and the infusion prepared in half an hour yielded 1·86 gramme.

From these results, I draw the following conclusion:—namely, that infusions of bearberry, buchu, cascarilla, cinchona, cusparia, dulcamara, gentian, hop, linseed, rhatany, rhubarb, senega and valerian, can be prepared in half the time ordered by the Pharmacopœia; those of digitalis and serpentaria in one-fourth the time directed for infusion; and this without resorting to any special manner of making.

I trust the Pharmacopœia Committee will take up this subject, examine it for themselves, and make the necessary abridgment of the time in the directions for making these infusions, and thereby facilitate their speedy preparation.

The extracts obtained in this series of operations are of course perfectly dry, for the most part in a spongy condition, and can be easily reduced to powder. Extract of rhubarb, as all dispensers must know, is either very soft or tough, and, when in the latter condition, is difficult to manage in pill making; the exsiccated extract on the other hand is exceedingly manageable, and can be at once without trouble reduced to fine powder.

Dr. Attfield said Mr. Barnes seemed to have given his result in terms of the weight of extract, but he presumed he also judged of the character of the infusions by the nose and palate.

Mr. Barnes said he had done so.

Dr. Attfield said it would have been interesting, in the case of the extract of cinchona, to ascertain whether there was the same proportion of the alkaloids in each case, although, no doubt, they would go into solution at about the same rate as other substances.

The Chairman said the remark of Dr. Attfield suggested the desirability of carrying these experiments further; but, whatever might be the result of such researches, it was evidently of importance to pharmacists to know that, in case of necessity, they might make an infusion in half an hour as well as in one or two hours. He was sorry to say that prescribers did not order infusions as much as formerly, because, in his opinion, a good fresh infusion, if employed as a stomachic, was much better than a tincture of the same substance. He believed, however, the great difficulty with medical men had been the delay which was necessary in the preparation, which often could not be allowed; and other preparations were therefore had recourse to. He believed this matter was well worthy of the attention of the Pharmacopœia Committee whenever they sat.

Mr. Bass asked if Mr. Barnes had tried the experiment of redissolving the extract in the same amount of water required to make the infusion; and, if so, whether the difference in smell, taste, and general appearance was very perceptible, or whether he found much difficulty in redissolving the extract.

Mr. Barnes said he had not made the experiment referred to, but in washing out the dishes he found the extract very readily soluble.

Mr. Carteighe said the paper was one of great practical value, but he believed it was possible to carry the experiments further, and, by increasing the quantity of ingredients, get quite as satisfactory results in a quarter of an hour. It would certainly be a great desideratum if any infusion in the Pharmacopœia could be made in ten minutes or a quarter of an hour; and he could not help thinking that very often, if they were content to waste a little more of the drug, it would, in the long-run, be much more economical than waiting so long as they were in the habit of doing.

Mr. Umney said he did not suppose that, in the case of infusions made at a very high temperature, the extract would be redissolved very readily, on account of the albuminous matter being coagulated, but those obtained at the temperature of boiling water would probably be readily soluble.

Mr. Tilden said, no doubt the suggestion made by Mr. Carteighe was one founded on practical experience; but he fancied that increasing the proportion of the ingredients, and using a shorter time, would hardly be a fair way of altering the mode of preparing infusions. For instance, in the case of an infusion of orange or of buchu, if such a plan were adopted, the result would be very different to what it would if the infusion stood for a longer time. A cup of tea that had stood for a long time was not exactly the same as one made quickly.

Mr. Carteighe said, no doubt the thing must be done cautiously, but the experiments showed such a trifling difference in the most extreme cases that a slight increase in the ingredients would probably reduce the time materially.

Mr. Barnes did not think that the dry extract of buchu, if dissolved in water, would represent the infusion, and the same with gentian.

Professor Redwood said, all facts of this kind must be of importance to those engaged in revising the Pharmacopœia; and, no doubt, it was desirable to reduce the time required for making infusions, but still there were other points to be taken into consideration in connection with that object. This matter received attention at the time the last edition but one of the Pharmacopœia was being prepared; and the whole of the infusions were submitted to a careful examination, with the view of determining the best proportion in which to use the ingredients, the best time during which to conduct the maceration, and the best temperature for the water. He was not prepared to offer any specific opinion with reference to the points specially alluded to by Mr. Barnes; but he must say he did not consider the shortening of the time during which the infusion stood was the most important point to attend to. Indeed, he believed the product might be considerably deteriorated by aiming too much in that direction. For instance, in tea-making there was a certain specific time, which was found to be most advantageous for making a good infusion; and all tea tasters had come to the conclusion that seven minutes was the period during which tea ought to be infused. In order to bring out the best qualities of the tea, this time should be neither longer nor shorter. It was the same with several of the infusions orderd in the Pharmacopœia. For instance, in the case of chiretta it had been found that water at 120° yielded a more agreeable infusion, and one which was considered to act better as a tonic than when made with water either hotter or colder. The mere amount of the extract, therefore, was not the only point to be considered, nor did he suppose that Mr. Barnes had confined his attention solely to that. At any rate the subject was one deserving of attention, and if it were found that the time could be shortened without detriment, there was no doubt that it would be advantageous, but he believed many chemists were under the impression that there was more difficulty in keeping fresh infusions fit for use than the facts would fully warrant. It was by no means difficult to keep even those most susceptible of change, in a fit state for use, not only for days, but weeks, and in some cases he had done so for months, by properly preparing and bottling them, either with stoppers or with cotton-wool in the neck of the bottle, so that no unfiltered air could reach the contents. In such cases, therefore, the time occupied was of comparatively little importance.

Mr. Barnes said he was led to make these experiments by having to make an infusion of serpentaria one day, when, the patient being very unwell, it was wanted in a great hurry, and he found that by the method suggested the infusion was made in half the prescribed time (two hours) equally agreeable and as good in every respect. When half a pint of an infusion which had macerated half an hour, was evaporated to dryness, the resulting extract weighed and found to be the same weight, or within a centigramme or two over or under the amount obtained from the same quantity of infusion which had taken one hour to make,—he could not conceive how it was possible to suppose that the one infusion was not as good as the other.

The Chairman said Mr. Barnes had chosen a very fair way of arriving at something like a definite conclusion; and certainly, for his own part, if he were to make two infusions of the same drug, allowing them to stand different times, he should scarcely like to rely upon his own judgment in tasting and smelling the results as a means of judging whether they were precisely alike. He should almost want a committee to decide upon such a point. Dr. Redwood had referred to the system of filling up bottles with fresh infusions, which had been adopted over and over again, and no doubt they would keep good in the ordinary sense for a considerable time, that is to say, they did not turn mouldy or sour, but he did not think there was the same aroma as when freshly made. That was why he suggested at one time that infusions intended for keeping should have a small quantity of alcohol added to them, which from some experiments seemed to have the effect of retaining the odour and aroma. He had known infusions carefully made go bad in twelve hours in hot weather,—senna, for instance, —even when kept in a cool place.

Mr. Bland said the remarks of Professor Redwood showed the necessity for caution in the mode of preparing infusions, and it must be remembered that even if they could be made in ten minutes the patient could not take the medicine boiling hot. With regard to cinchona, he was quite satisfied that in most of the processes given for its preparation a large quantity of the alkaloids were wasted. He was satisfied that no infusion of cinchona made in one hour would contain all the alkaloids which might be extracted from it.

Mr. Umney said, some time since, Professor Redwood, in his *résumé* of the alterations which would in all probability be made in future editions of the Pharmacopœia, mentioned the fluid extract of ergot as one of those preparations which he thought could be equally well prepared without ether. He (Mr. Umney) had made considerable quantities in both ways, and he found no difference in the product after it had been kept four or five months. He would lay on the table two specimens which had been made about four months, one prepared in each way. It was important to recollect that the loss of ether was something considerable,—70 or 80 per cent.; and it appeared to him a farce to take up an inert body by means of an expensive solvent like ether, and then to redistil it, and then to throw away that inert body.

Mr. Barnes asked what solvent Mr. Umney employed.

Mr. Umney replied water only at 120°.

The Chairman said he supposed Mr. Umney had followed the directions in the Pharmacopœia, simply omitting the ether. He had always thought the ether process unnecessary, and it involved not only a waste of material, but a waste of time.

Mr. Martindale said he had always felt that there was a disadvantage besides that of taking the oil from the ergot by means of the ether, for they could not be certain that they did not take away some active properties which the water alone would not have done. There was therefore a great disadvantage in using ether to exhaust the oil, because it might likewise take with it other principles which might be of great service. He had made the fluid extract as Mr. Umney had suggested, and it had been used for a considerable time at University Hospital, and equally approved with that made in the ordinary way.

Professor Redwood said that if the ether was not thoroughly well washed, so as to deprive it entirely of spirit, it would remove some of the active principle of the ergot. The result of the experiments made seemed to indicate that pure ether did not take out the ordinary active matter of the ergot, but only the essential oil. In justice to one of the members of that Society, he should say his attention was first drawn to this subject from the fact of Mr. Hemingway having communicated to him that the fluid extract of ergot could be made quite as well without ether as with it, and that he had been in the habit of so preparing it for some time.

A Member said he had prepared the extract without ether for some years before it was introduced into the Pharmacopœia, and had not found that there was any difference in its strength.

The Chairman said Professor Redwood had suggested other matters in which some alteration in the mode of preparation might be made, amongst others purified oxgall and belladonna plaster. He should like to know whether any of the members had made experiments upon any of these preparations.

Mr. Umney thought that the belladonna plaster would be much better if made in the mode suggested by Mr. Balmer, with the alcoholic extract of the root.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

Annual Meeting.

Session 1869–70.

The Annual Meeting was held at the Royal Institution, October 13th, 1870. In the absence of the President, Mr. Shaw took the chair.

Messrs. F. Allison, J. Blair, A. T. Horton and E. Keighley Sharp were elected members of the Association.

The Secretary then read the Annual Report.

Annual Report.

The Report which your Council lay before you this year presents features of unusual interest, both with reference to the Association itself and also as regards events closely connected with it, and which should exert considerable influence on its progress and vitality. Having completed the twenty-first year of its existence, the Association has given evidence of its ability to contend with and overcome the difficulties incident to the youth of all voluntary societies, and may now look forward confidently to years of strength and usefulness. Still there are dangers to be avoided; the enthusiasm which greeted its early years has passed away, and from its solid advantages and practical value to its members it must now derive its support. To provide these, and to watch over the interests of the Association are the duties of your Council, and they trust that you will find that they have not neglected their responsible functions.

15 members and 2 associates have been elected during the past session; 24 have resigned, or by death and removal have ceased to belong to our ranks, leaving 127 at present on the roll.

In that important department of the work of the Association which consists in its fortnightly meetings, your Council cannot report so favourably as in some former years. The interest of these meetings can only be kept up by the united efforts of the members, and your Council trust that by an increased supply of papers, and more vigorous discussion of them, their usefulness may be augmented. The papers read have principally related to the practice or ethics of pharmacy, and your Council desire to express their acknowledgments to those gentlemen who have contributed them.

Several additions of valuable works have been made to the library, and its treasures have been freely used. The Librarian reports that 374 books have been taken out, against 290 in the previous session, and that this does not represent the whole benefit resulting from the constant access which members have to the books, as in many cases they are consulted at the library, and not taken away.

Your Council have the pleasure of announcing that ten guineas have been voted by the Pharmaceutical Conference from the Bell and Hills' Fund for the purchase of books for the library.

The Materia Medica collection in the museum is arranged, affording a complete illustration of the Pharmacopœia, and your Council have much pleasure in informing you that a valuable collection of 70 dried medicinal plants has been presented to the Association by Mr. Ransom, of Hitchin.

The School of Pharmacy has been conducted as in the previous sessions. Your Council have had the subject of providing pharmaceutical education under their careful consideration, and trust that the measures which they have adopted will be attended with increased success.

The lectures on the evenings of the general meetings by Mr. Davies, F.C.S., have also been continued during the past session, and have formed a valuable part of the proceedings of the session.

Your Council have been much gratified by the visit of the Pharmaceutical Conference. The meeting has been most successful, the numbers attending having been large, and the expressions of satisfaction general.

A very pleasant opportunity for friendly intercourse was afforded by the President at his house in January last, and a large number of members enjoyed his hospitality.

The following members of Council retire by rotation, and are eligible for re-election:—Messrs. Davies, Murphy, Sharp and Dr. Symes.

Your Treasurer will present a report of the finance of the Association which shows a balance due to him of £14. 15*s.* 3*d.*

The Treasurer read the financial report.

The Liverpool Chemists' Association in account with John Shaw, *Treasurer. Session* 1869–70.

Cash received.		£.	s.	d.
Balance from 1869		1	12	6
109 Members' Subscriptions	£54 0 0			
Less One Member paid twice	0 10 0			
		53	10	0
Arrears		0	15	0
13 Associates' Subscriptions		3	5	0
Microscope Fees		0	4	6
Library Fines		0	3	3
Balance due to Treasurer		14	15	3
		£74	5	6

Cash paid.	£.	s.	d.
Rent	10	10	0
Tea, Coffee and Attendance	12	12	10
Insurance	1	0	0
Books and Periodicals	7	5	0
Printing and Stationery	15	18	0
Directing and Delivering Circulars	6	1	6
Collector's Commission	1	16	9
Mr. Davies for Lectures	8	5	0
Secretary's Expenses	0	15	5
Librarian	4	0	0
York Glass Company	3	1	0
H. Gilbertson and Sons, for Glass	3	0	0
	£74	5	6

Examined and found correct, October 13th, 1870.

Charles Sharp,
Alfred Henry Mason } *Auditors.*

Mr. Shaw moved "That the Reports as read be adopted, and together with the Transactions of the General Meetings, the Laws and Bye-laws, the Catalogue of Books in the Library and the List of Members, be printed and circulated among the members." He explained that the deficit was caused by extra expenditure on the museum and library. Next year there would be several items of expense omitted, and he hoped that this feature would not recur.

Mr. Mason seconded the resolution, and observed that in many cases employers did not give sufficient opportunity to their apprentices and assistants for study. The resolution was carried unanimously.

The meeting then proceeded to the election of four members of the Council in place of Messrs. Davies, Murphy, Sharp and Dr. Symes, who retired by rotation. The retiring members were re-elected.

Mr. Mason moved that a special vote of thanks be given to Mr. Ransom, of Hitchin, for his donation of 70 dried medicinal plants for the museum.

The vote was seconded by Mr. Redford and carried unanimously.

Mr. Tanner moved the following resolution, That the best thanks of this meeting be given to the donors to the Library and Museum, and to the authors of papers during the past session.

The motion was seconded by Mr. T. F. Abraham and passed.

Mr. Woodcock moved, "That the best thanks of this meeting be given to the officers and council for their valuable services during the past session."

Mr. Tate seconded the motion, and alluded to the constant attendance of the President, and to the large amount of labour which had fallen upon the Secretary during the session. Carried *nem. con.*

Mr. Redford said that he was glad that no expression of regret had appeared in the Report with reference to the deficit, as he considered that the money had been well spent and fully accounted for. He called attention to the new arrangements for the School of Pharmacy, and hoped that a new epoch of success had been commenced. He proposed a vote of thanks to the Chairman.

Mr. Tate seconded the motion, which was carried by acclamation, and the meeting separated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The First General Monthly Meeting of the Winter Session, 1870–71, was held in the Music Hall, on Wednesday evening, October 19th, when there was a good attendance of Members and Associates to hear Dr. J. C. Hall deliver the Inaugural Address. Mr. E. Wilson, the President, occupied the chair. Dr. Hall commenced his remarks by saying that he had the honour of being the first President of the Associated Society of Chemists and Druggists in that district, and he could not but remember that he then said that it was of the utmost possible importance that all chemists and druggists should be associated together in one body, and that the same good plan should be adopted with regard to them as was pursued in respect to his own profession in the passing of the Apothecaries Act of 1815. That Act had done more to advance the interests of the medical profession than any measure that ever was passed. He had the greatest possible respect for the then Pharmaceutical Society, but he could not help at the time expressing the feeling that a wise thing would be done if a general association of chemists and druggists could be formed. He congratulated the meeting that his advice had been taken and that they now were a united body. The newspapers were filled with discussions on the subject of technical education. Educational Boards were now being formed all over England; and a Bill had been passed with a view to giving that education to the young which had been found to be of so much importance, more especially in Germany. If young chemists and druggists did not desire to be pushed aside, they must be up and doing; they must be active in their determination to possess that general knowledge which would fit them for the acquisition of the technical learning absolutely necessary to enable them to succeed in the profession on which they had embarked. They might ask how could they find time to cultivate their intellectual powers when they had to rise early in the morning, and from the time they pulled down the shutters to the time they put them up again were incessantly engaged. All he could say was, that as soon as they could, they should get up an early-closing movement, which would do them good and do their masters no harm. He had always found, too, that men with an earnest purpose could find time to make time, and a lad should get up an hour before it was time to take down the shutters rather than be left behind in the race. It was really astonishing how fruitful the shortest season was found to be when rightly employed. He would exhort them to profit by every spare moment, and, amongst other things, to acquire a knowledge of the French or German language,—better if of both. He would not deny any one relaxation from toil, but he could assure them that the solid enjoyment to be realized in the pursuit of knowledge was to an indefinite degree better than that to be found at casinos and singing-rooms. He pointed to the wide field which chemistry opened to them for the exercise of their talents, and besought them not to be daunted by any difficulties in the cultivation of that science which had done, and was still destined to do, so much for mankind. The lecturer, on resuming his seat, was loudly applauded.

Mr. Radley proposed, and Mr. Wilson seconded a cordial vote of thanks to Dr. Hall for his able address, and it was unanimously carried.

The minutes of the last meeting having been read and confirmed, and other business transacted, the meeting broke up.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Annual Business Meeting.

The Annual business Meeting of this Association was held in the Mechanics' Institution, 38, Bath Street, on Thursday evening last, 27th Oct. There was a large attendance of members; Mr. John M'Millan, the retiring President, occupied the chair. The Treasurer, on being called upon, made his statement, which showed a balance of £5. 12*s.* 6½*d.*, being much larger than that of any previous year. The Secretary then read the following report:—

"It is very gratifying to notice from the records of this Association, that a gradual improvement has been going on from year to year in the character and importance of the Association; and this progress has not been less noticeable in the past year than in any of its predecessors. The number of members on the roll is ninety (twenty-three of whom are employers); and though it is not what might be expected in such a large city as this, still it shows a vast improvement from what it was five or six years ago. This increase is doubtless attributable to the interest created by the passing of the Pharmacy Act in 1868, an interest which, we trust, will never die away. The first point of interest to be noticed among last year's records is the short course of lectures on chemistry by Dr. Moffat, all of which were well attended and highly appreciated. Those papers of professional interest, read by the members at the fortnightly meetings, were most creditable to the authors; while the discussions which usually followed brought out the great amount of pharmaceutical knowledge to which many of the members have attained. The President's Prize for the best Essay on "The Iron Preparations of the British Pharmacopœia," was not the least important of last year's transactions; and though it is to be regretted so few took advantage of that respected gentleman's liberality, it is gratifying to note that the papers sent in were of such a character that the examiners had some difficulty in giving their decision. The Pharmaceutical Journal has been received regularly throughout the year by your Secretary, and its contents perused by those members who do not get it direct. The annual Soirée and Ball of the Trade was, as usual, quite successful.

"The arrangements for the forthcoming Session are in a very forward state. Dr. Moffat is expected to follow up his course of lectures on chemistry of last year this Session also; and Mr. Hennedy, Lecturer on Botany to the Mechanics' Institution, is expected also to contribute to this winter's course; while 'Volumetrical Analysis,' 'Volatile Oils,' and other important subjects, will be discussed by the members. Your Committee also trust that the discussion last year on the 'Trade Price List' and 'Early Closing' will not be forgotten; for, though some improvement has already been made, we are not to rest satisfied. It is the province of societies such as ours, as it is to the interest of every member of the profession, assistant or employer, to take up such questions. Success in this, however, as well as in other things, depends altogether upon the unity and co-operation of all. It is therefore hoped that a large number of additional members will come forward this Session, and that the committee to be appointed will work as faithfully as former committees have done in the past."

The President, in proposing the adoption of the report, delivered his valedictory address, in course of which he took occasion to notice the action taken by this and other societies throughout the kingdom in reference to the proposed "Regulations for Keeping and Storing Poisons," expressing a hope that we shall hear no more of them after the opposition which they met; and that as the education of the pharmacist was now compulsory, the manner in which his business should be conducted would be left to his own discretion.

The reports were afterwards adopted, and the following officers were appointed for the ensuing Session, viz.: —*President*, Mr. Thomas Davison; *Vice-President*, Mr. R. Brodie; *Treasurer*, Mr. T. D. Cassells; *Secretary*, Mr. J. M. Fairlie; with a large and influential Committee.

Votes of thanks to the retiring officers brought the meeting to a close.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Wednesday, September 14th.

(*Continued from page* 354.)

Mr. Brady informed the Conference that the meeting of the General Committee of the British Association had just decided to make some important alterations in its future procedure as to towns to be visited. It had been determined to fix the place of meeting two years beforehand, which would give more time for making local arrangements. Of course, this alteration had a special interest for the Conference.

The President then called for any invitations to the Conference to hold its meeting next year.

Dr. Attfield read the following communication from Glasgow:—

"*Glasgow, Sept.* 10*th*, 1870.

"Dear Sir,—Anticipating that the members of the British Pharmaceutical Conference will honour this city with their presence next year, the Committee of the Glasgow Chemists and Druggists' Association have desired me to express their gratification at the prospect of meeting those who are so well known in name among them, but whom they have as yet not had the pleasure of seeing here; and to state that, in the event of such being agreed upon, they will be prepared to give them a hearty welcome, and be most happy to co-operate with and assist them in making the necessary arrangements.

"I am, dear Sir, yours respectfully,

"James M. Fairlie,

"*Sec. G. C. and D. Assoc.*"

"*To Dr. John Attfield,*

"*Sec. of the British Pharmaceutical Conference,*

"*Adelphi Hotel, Liverpool.*"

Mr. W. D. Savage said that at a meeting of the Chemists and Druggists' Association of Brighton, it was resolved that the Mayor (A. H. Cox, Esq.) and himself should appear at that meeting as delegates to convey to the Conference an invitation to visit Brighton. He regretted that his Worship the Mayor was unavoidably prevented being present, but he assured the Conference that, if it visited Brighton, it would have a hearty welcome. The wishes of the chemists of the town had been made public in the following announcement, which appeared in the Brighton papers of August 30th:—"At a meeting of the Chemists and Druggists' Association, held in the Mayor's Room on Friday last, S. A. Brew, Esq., in the chair, it was unanimously resolved to invite the members of the Pharmaceutical Conference to come to Brighton next year, or whenever the British Association favours us with a visit; and his Worship the Mayor (A. H. Cox, Esq.) and W. D. Savage, Esq., were delegated to convey the invitation. At the same meeting, Mr. T. J. Gwatkin sent in his resignation as honorary secretary in consequence of ill-health. A vote of thanks, and a unanimous feeling of regret to lose such valuable services, was passed, and Mr. Julius Schweitzer was elected in his stead."

Mr. Baildon (Vice-President) rose to convey, on behalf of Edinburgh, the message of invitation to the Conference with which he and his fellow-delegates were charged. He did not know if the British Association would select Edinburgh for its meeting in 1871, but he could promise the Conference that whenever it visited that city, it would receive a hearty welcome, and that everything would be done for the convenience and gratification of its members.

Mr. Mackay cordially seconded his friend Mr. Baildon's representation of the feeling of the chemists of Edinburgh.

The President expressed his sense of the honour done to the Conference by the invitations now received, and stated that, in accordance with usual custom, the decision upon the place of meeting would for this year be postponed until a final meeting, to be held on the following Tuesday.

The Fulmar (*Fulmarus glacialis*) and Fulmar Oil.

BY EDWARD C. C. STANFORD, F.C.S.

In the parish of Harris, Inverness-shire, nearly 200 miles from Inverness, and about forty-five miles west of the nearest point in North Uist, 57° 50′ N. lat. and 8° 35′ W. long., is situated perhaps the most remarkable, certainly the loneliest, little village in Great Britain.

"St. Kilda's lonely isle" is seldom reached by strangers, and I therefore record briefly some impressions derived from a recent visit. There are several islands, one of which only, the south or main island, is inhabited.

Seen from North Uist on a very clear day, the main island has exactly the appearance of an enormous whale on the horizon, and the north islands look like a huge sea-fortress with a tower on each side.

The north island, or island of Boreray, with its surroundings, is perhaps the boldest. We sighted this island in the early morning looming through a dense mist, and quite close to the vessel. As the mist suddenly cleared away, a startling scene presented itself. A perpendicular rock, some 1000 feet in height sheer out of the Atlantic, towered above our heads. Its face, covered with lichens of every variety of colour, was gorgeously illuminated by the rising sun. It was flanked by two enormous rocky pillars 800 to 900 feet in height, one of which is beyond the perpendicular. This rock is an extraordinary sight; it is perfectly white from sea-line to summit, being completely covered with the white eggs, droppings and feathers of an innumerable family of Solan geese, which are said to keep this rock entirely to themselves. We astonished the winged inhabitants by a cannon-shot, but they repaid the astonishment with interest, for we were unprepared for the extraordinary effect of the myriads of wings which immediately hovered over and around us, and turned day into night.

St. Kilda proper lies about three miles south of Boreray. It may be described as a precipitous mountain ridge, which in some parts falls sheer into the sea, with enormous precipices some 1500 feet high. It is three miles long and two miles in its extreme breadth. It lies $50\frac{1}{4}$ miles due west of Schillay Island in the Sound of Harris. The formation is marked in Nicholl's geological map as greenstone with syenite veins. On the south-east side the hill slopes down to a small open bay much exposed, and the landing is difficult. On this side of the hill the village is situated. About thirty houses, well built and better roofed than is usual in the West Highlands, are occupied by about seventy inhabitants. The population does not increase, the infant mortality is large, and said to be peculiar to the island.

It is somewhat remarkable that the inhabitants are not fishermen, but are all farmers and birdcatchers. Until quite recently none of the men knew how to fish. The staple food of the island is a bird called the fulmar, which forms the subject of this notice.

This bird is a species of petrel, the *Fulmar glacialis*, or *Procellaria glacialis* of Linnæus, the Fulmar petrel of Buffon, belonging to the family of *Procellarieæ*, order *Natatores*. At a distance the bird might be mistaken for a gull, which it resembles in size and colour; it is more nearly allied, however, to the albatross, which it resembles in its remarkable bill and its vomiting oil when attacked. The head, neck and lower parts are pure white, the wings and back bluish-ash, and the bill bright yellow. The bill is stout and thick, the upper mandible considerably hooked at the tip, where it is also dilated and sulcated; the lower mandible is straight and slightly truncated. The nostrils are united in a single tube. A sharp claw on the legs takes the place of a hind toe. The flight of the bird is very beautiful, and it has a remarkably graceful movement of the head. The fulmar inhabits Polar regions, and, so far as I can ascertain, is unknown in any other of the outer Hebrides, and is found only on St. Kilda. It breeds enormously there in the rocks, laying a single large white egg, and the young is fed by the oily matter disgorged by the parents.

The strong bill enables them to extract oily matter, by perforating the skin of dead seals or whales.

In Newfoundland they feed largely on the codfish offal, and probably they are experienced fishers everywhere.

The method of catching these birds is peculiar to St. Kilda; the men may well call themselves bird-catchers, for assuredly there are none like them. The process seems simple enough, but the awful danger must be seen to be appreciated; indeed, the climbing propensities of these men would astonish any member of the Alpine Club.

Hanging on a rope (often made of heather) the bird-catcher descends the fearful precipices, armed with a sort of fishing-rod, having a slip noose at the end. This he dexterously throws over the head of the bird, which is sitting on a ledge of the rock beneath him, and hauls him up. He then dips the bird's beak into a small leather bag suspended to his waist, and there the oil is vomited. The bird is then killed and eaten as food, the feathers and the oil forming the two articles of export. Beds made of the feathers are said never to harbour insects, but it is alleged also that they are difficult to keep dry.

The oil is a good deal mixed with a rougher sort from Solan geese, and realizes a poor price as an ordinary rough fish-oil. The sample I exhibit is genuine. It is of a clear, dark, slightly reddish sherry-colour, and has a powerful and peculiar odour,—an odour of which the whole island and all the inhabitants smell. It is certainly a fish-oil, and it possesses nearly all the properties of cod-liver oil.

Its specific gravity is midway between cod-liver and sperm.

Fulmar Oil,	sp. gr. . . .	·902
Cod-liver, light	,, ...	·924
,, brown	,, ...	·929
Sperm Oil	,, ...	·875

It is soluble in ether. Cold alcohol dissolves less than 1 per cent. and hot alcohol 3 per cent.

Treated with a drop of oil of vitriol, it produces precisely the same coloured reactions as cod-liver oil, which, if the generally-received views be correct, would show it to be a liver-oil.

It contains a very faint trace of iodine.

Heated with oil of vitriol and excess of potash it gives off a strong odour of oil of rose.

Saponified with soda, the soap retains the peculiar odour, and yields a tolerably fluid fatty acid on acidifying the solution.

I shall be glad if this short notice of fulmar oil will induce any one to experiment with it for medicinal purposes. I have no doubt a good deal might be obtained, and a good market would be a boon to that isolated people.

The specimen of fulmar exhibited, and which is offered to the Museum of the Pharmaceutical Society, was one of two that I had stuffed after keeping them alive for about a fortnight. It has suffered a little in appearance from its captivity.

The PRESIDENT expressed his interest in the singular facts laid before the meeting by their friend Mr. Stanford. The habits of birds included some phenomena which were startling by their uniformity and obedience to some hidden rule. Thus, the sea-birds frequenting the rocks near Tenby were in the habit of appearing for the season upon a certain and uniform day each year.

Mr. GROVES, remarking upon the powerful odour of guano evolved by the stuffed specimen upon the table, said that the egg of the fulmar had also a strong smell.

A MEMBER referred to the recent Sea-birds Preservation Act, mentioning that the island of St. Kilda was specially exempted from its operation.

Mr. MACKAY stated that the deplorably destitute condition of the population of St. Kilda was ample justification for this exemption. Sea-birds and their eggs might be said to be the sole food of the people, who were often on the verge of starvation. Food was occasionally sent to the island, but sometimes the sea was so rough that no communication could take place for a period of months. He had understood that the skin of the bird was made into shoes.

A FEW NOTES ON ALOES.

BY WILLIAM A. TILDEN, B.SC. LOND., F.C.S.,

Demonstrator of Practical Chemistry to the Pharmaceutical Society.

In the list of subjects for investigation issued to the members of the Conference is the following question, No. 176:—"Compound Decoction of Aloes loses bitterness after some time; to what is this due?"

Before attempting to answer this question, a few points in the chemistry of aloes require notice.

In the last edition of Pereira's 'Materia Medica' four proximate principles are enumerated as forming the most important constituents of aloes.

1. Aloetin, aloesin, amorphous aloin, bitter principle of aloes.
2. Crystallized or hydrated aloin.
3. Resin.
4. Aloesic acid; supposed by some to be gallic acid.

Experiments made by myself, in addition to those already published by Mr. Groves and other chemists, induce me to adopt an opinion respecting the constitution of aloes somewhat modified from the foregoing.

I. *Aloetin.*—The first of these bodies certainly forms a constituent very important as to quantity of all the varieties of aloes. There can be no doubt that it is the product of the alteration of crystallizable aloin, partly by the action of heat, partly by the oxidizing action of the air. I regard it as a mixture of anhydrous aloin, which is capable in the presence of water of recovering its crystalline condition, and the brown oxidized substance referred to further on.

II. Crystallizable *aloin* is the body to which especially all the varieties of aloes owe their bitterness. Its isolation is usually thought to be a matter of some difficulty, but the following simple process will furnish any desired quantity,—pounds if necessary.

Select a specimen of Barbadoes aloes, the most powerfully odorous that can be procured, bright-looking, and not the most waxy: break it up and dissolve it in a quantity of boiling distilled water, to which a few drops of sulphuric, sulphurous, or hydrochloric acid have been added. The proportions employed may be those of the Pharmacopœia for Extractum Aloes, viz. one pound to a gallon. Let the liquid stand a night to deposit resin, then pour it off and evaporate quickly till, if 1 lb. of aloes have been used, about 2 lbs. of liquid remain.

This left for twenty-four hours will deposit an abundant crop of yellow crystalline matter. The fluid portion poured off and duly concentrated yields a first-rate extract. The yellow crystals must be well drained and pressed, and will yield pure aloin by recrystallization once or twice from water mixed with a small proportion of rectified spirit. If the selection of the aloes be looked to, the product will amount to about 20 per cent. of the material employed.

Aloin has been said to be with great facility decomposed or altered by the simple application of heat to its aqueous or alcoholic solution. I have found, however, that it will bear without appreciable change comparatively rough treatment in this way, provided the solution is quite neutral or slightly acidified. A little pure aloin dissolved in distilled water may be evaporated to dryness and heated till it fuses, and then redissolved in water, and this operation repeated several times, but the aloin undergoes but slight change of colour, and will still crystallize on letting the solution stand for an hour or two, or almost immediately on stirring. The transparent yellow varnish left by evaporating solutions of it consists merely of anhydrous aloin; treatment with water restores to it its crystalline state. It is of course already known that if kept in a moist state on a water-bath for some time, the pure substance becomes gradually brown, and assumes the appearance of Socotrine aloes; but this is a comparatively slow process, and even after some time a considerable quantity of the aloin is still capable of crystallizing.

A further illustration of its stability is exhibited in the following experiment and accompanying specimen. About ten years ago, a paper by Kosmann appeared in the *Journal de Pharmacie*, the object of which was to show that aloes was a mixture of glucosidic bodies. The experiments by which grape sugar was obtained, and its presence indicated by the asserted production of alcohol and carbonic acid, were performed by Kosmann solely upon Cape aloes. I have made a number of experiments which convince me that he is quite incorrect in his statements, but as I hope to reproduce the subject at a future meeting, I will cite only one experiment made with pure aloin. Some aloin was dissolved in about an equal weight of oil of vitriol (it forms a clear orange syrup); the solution was gently heated for a few minutes, and then poured into water and kept boiling for about four hours.

Saturated by excess of pure carbonate of barium, filtered and evaporated on a water-bath, a minute quantity of barium retained in solution precipitated by dilute sulphuric acid and the liquid further concentrated, unaltered aloin was deposited in yellow crystals. A part of the solution which had been thus treated was submitted to the fermentation test. Three tubes full of mercury were inverted in a small mercurial trough. Into the first was introduced some washed yeast and distilled water. Into the second some washed yeast and a weak solution of sugar. Into the third some yeast and the boiled solution of aloin. The first and third gave no bubbles of gas larger than a pin's head; the second tube was completely filled with CO_2 in half an hour.

To ascertain if the aloin prevented fermentation, two similar tubes were set up. The first contained yeast, distilled water and sugar; the second had in addition a portion of the solution which had been boiled and tested as above. Both gave gas in about half an hour nearly equally. A portion of the same sample of yeast was used in all these cases. There is consequently no sugar produced by boiling aloin with acids, and the aloin undergoes practically no change.

The copper test is inapplicable, inasmuch as pure aloin which has undergone no manipulation reduces alkaline copper solutions rapidly and freely.*

Aloin gives no apparent change with tartar emetic nor with ferrous salts, but with ferric salts it strikes an olive coloration, which is destroyed by reducing agents.

III. The substance termed *resin*, which abounds in all kinds of aloes, is not very happily so called, for it is soluble in considerable quantity in hot water. It is said

* I have found that many other bodies besides the glucoses do this; amongst others, tannin and orcin.

to yield chrysammic acid by treatment with nitric acid, and is therefore related in some way to the soluble part of aloes; but this is a point upon which nothing is known at present.

IV. There can be no doubt that the "aloesic acid," supposed to be present in aloes, has no existence. The reaction with iron salts, ascribed to it is due to the crystallizable aloin, and the acidity to test-paper presented by an infusion of aloes is a property of the half-oxidized substance contained in the uncrystallizable "aloetin."

V. In addition to those bodies, there is in all aloes a small but notable proportion of vegetable albumen. It is left when either kind is exhausted with rectified spirit. Its presence probably promotes the change to which solutions of aloes are always subject.

Pure aloin, then, in pure solutions, is liable only to very tardy alteration. Exposed to the air, it gradually absorbs oxygen, and the solution deepens in colour; but the change which is thus slow under such circumstances, is very rapid indeed if a small quantity of any alkali is introduced. The solution then becomes in a few hours of a deep brown colour; and after the lapse of three or four days, if the air be admitted, the aloin entirely disappears, and is transformed into a substance, or mixture of substances, which no longer possesses any bitterness, but is perfectly insipid. An experiment was made by dissolving pure aloin in water with an equal weight of carbonate of potassium; the solution, left in an imperfectly closed flask for about a week, entirely lost its bitter taste. Nitrate of barium was added to remove the carbonate, and the filtered liquid mixed with acetate of lead. The result was a dirty greenish precipitate, which was removed and basic acetate of lead added. This gave a bright orange precipitate, which was collected and analysed. Its composition, compared with that of aloin, is shown by the subjoined numbers:—

Aloin (Stenhouse).		Yellow Precipitate.	
C	60·67	C	14·30
H	5·65	H	1·40
O	33·68	O	25·71
		Pb ..	58·59
	100·00		100·00

From which it appears that whilst in aloin the carbon stands to the oxygen nearly as 1 to $\frac{1}{2}$, in the oxidized substance it is, roughly speaking, in the proportion of 1 to 2.

Some extract of Socotrine aloes was boiled with carbonate of potash and water, in the proportion directed for the preparation of compound decoction of aloes, the remaining ingredients being omitted. Keeping this solution in the way described, it also became tasteless and gave the same reactions.

Mr. William Young, pharmaceutical chemist, proposed the question which stands in the Conference list, and I am indebted to him for the specimens upon the table, and also for his permission to quote from a letter with which he has favoured me.

He says, "For more than ten years I have observed that decoct. aloes co. loses its bitterness on keeping, but I cannot say that it loses its aperient property. I have frequently taken a fluid ounce of various degrees of bitterness, and have always found it produce the desired effect. But this is a matter which does not affect the pharmaceutist so much as the fact that the public cannot be persuaded that a medicine which is not uniform in taste is rightly prepared. I venture to assert that if a customer were to purchase successively at one establishment four ounces of decoct. aloes co. weekly, and each sample being a week older than the one immediately preceding, no two samples would be alike. Of course if, as I understand is the custom in some large establishments, a large quantity is prepared and kept some weeks before use, a greater uniformity would be arrived at; but that puts the small tradesman at a great disadvantage, who perhaps prepares a pint at a time, and sends it out fresh and intensely bitter. I know an instance of a chemist who nearly lost a valuable customer in the following way. He had been in the habit of dispensing a ℥xij mixture, containing ʒvj vini aloes. When he first prepared it he had a pint of the vin. aloes in stock, which probably had been made five or six years, and had not the slightest taste of aloes in it, but it pleased the patient. At length the stock was exhausted, and the mixture prepared with a fresh supply of vin. aloes recently prepared. The patient could hardly be convinced that a mistake had not been made; and it was found that ʒss of the recently-prepared vin. aloes imparted more bitterness to the ℥xij mixture than the whole ʒvj of the old. I have tasted samples of dec. aloes comp. concent. 1 to 3, almost devoid of bitterness; and a maker of that article informs me that it is a most unsatisfactory preparation."

The active constituent of aloes is still unknown. That the purgative property is not due to aloin was first shown by Robiquet, and is proved, I think, by the fact of its complete disuse after a very short trial. Mr. Young says that he has not noticed any variation of power in the specimens of different degrees of bitterness which he has tried; but, on the other hand, I have myself taken large doses of the oxidized alkaline solution of aloin, or of extract of aloes, without perceiving the slightest effect.

There is in Druitt's 'Surgeon's Vade Mecum' a prescription which, I am informed by the author, is the most active form in which any kind of aloes can be administered. Barbadoes aloes is made into a mass with strong sulphuric acid, and in that state rolled out into pills. Dispensing difficulties may have stood in the way of the more extensive employment of this form, but if it bears out the character attributed to it, it would seem that a half oxidized condition of the aloes is the most advantageous.

The questions which still remain to be solved with reference to aloes are numerous. Amongst others, two very important points seem to me to require examination. These are the nature and properties of the resinoid matter, and the cause of the differences between the several varieties of this important drug known to commerce.

The President said that the question discussed in Mr. Tilden's paper had very great interest, and he felt surprised at the extent of the change which had been found to occur.

Parliamentary and Law Proceedings.

A correspondent has forwarded to us a paragraph from the *Sherborne Journal*, in which it is stated that Joseph Grassby *alias* Gardiner, a chemist's assistant, was convicted at the late sessions of a robbery from Mr. Mason, of Weymouth, and sentenced to seven years' penal servitude. There were, besides, three other indictments hanging over him. The prisoner is well known in the trade, having held situations in many parts of the country, most of which he lost through dishonesty.

Obituary.

Another breach in the still narrowing circle of the original pharmaceutical body has occurred by the removal of Mr. Charles Wright, of Manchester. Those who were most intimately acquainted with the deceased gentleman have reason to remember his kind and liberal conduct, affording every facility for study, lectures, etc.

For several years past, increasing infirmities have prevented Mr. Wright taking an active part in business. His death was accelerated by a severe attack of bronchitis, the complaint which had troubled him much during the latter part of his life. He died last month at his country residence, Fairfields, aged 70 years, sincerely beloved and regretted by many friends. R. G. M.

Notes and Queries.

In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[2.]—MOUNTING MICROSCOPIC OBJECTS.—Allow me to recommend *R. J. M.* to peruse Davies on 'Preparing and Mounting Microscopic Objects' (2*s.* 6*d.*, Hardwicke), the most comprehensive book on the subject.—J. H.

[12.]—TEETH STOPPING.—*W. A. C.* sends the following recipe for the preparation of enamel for decayed teeth:—

℞. Hydrargyri,
Pulvis Stanni, aa ʒss.

Shake together for five minutes, then mix in the palm of the hand to a paste and fill up the cavity. No food should be eaten for three hours afterwards.

[13.]—EAU SÉDATIVE.—I suppose the "elegance" required by your correspondent in eau sédative is the removal of the particles of camphor. The only plan I know is by filtration; or would it not be better to substitute aq. camph. conc. for the sp. camph.? On the Continent the working classes, when purchasing eau sédative, generally ask for the bottle to be "well shaken up," the disciples of Raspail preferring to have some body in their lotion.—PHARMACIEN.

Your correspondent [13] has not sent the correct formula for the above preparation. The following is Raspail's recipe for the *weak* eau sédative, No. 1, which is that adopted in the Paris Codex:—

Ammoniaque liquide de 22°, equiv. to liq. ammoniæ ·923, or *about double* the strength of liq. ammoniæ, B.P. . . . . f℥ij
Alcool camphré (1 to 9), equiv. to sp. camph. B.P. . f℥iss
Sel marin (sodii chloridi) . . . . ℥ij
(*not Salts* ℥viiss.)
Eau distillée (aq. destill.) . . . . f℥xxxss
(*not* ℥xvij.)

Dissolve the salt in a small quantity of water, add the ammonia, then the sp. camph., and last the water (by small portions), diligently shaking after each addition.

Nos. 2 and 3 differ from the above only in the quantity of ammonia,—No. 2 containing ℥xx and No. 3 ℥xxv in the litre (℥xxxv). The solution is usually filtered, but some pharmaciens send it out turbid.—E. B. S.

[14.]—SACHET PERFUME.—Sachet perfume may be composed of nearly any agreeable mixture of dry scents, such, for instance, as lavender flowers, orris root, rose leaves, and benzoin, of each equal parts, with a little tonquin, vanilla and musk added according to taste. It should be ground up or roughly powdered. Or paper may be perfumed by steeping cotton wool in any favourite *esprit*, and placing it when dry in a desk with the paper.—GIVE AND TAKE.

[15.]—MEZEREON EXTRACT.—The mezereon extract in tinct. sapon. co. is doubtlessly added to increase the stimulating properties.—GIVE AND TAKE.

[16.]—ROME AND PARIS.—"*Pharmacien*" begs to inform *A. S.* that the hours in an English Continental pharmacy are generally from 7 A.M. to 10 P.M., and often much longer in the season, Sundays and week-days alike.

E. B. S. says the time of closing in Paris varies from 10 P.M. to midnight in different quarters of the city. Usually, however, regular work is suspended at nine o'clock, but the *élèves* remain ordinarily in the *pharmacie* (as their sitting-room), and are expected to spend their evenings in study.

[18.]—RUBINI'S CAMPHOR.—Alcohol and S.V.R. partes æquales. Camphor ad sat.—INQUIRER.

"*An Unexamined Member*" writes that Rubini's Tinct. Camphor is made by dissolving 5 oz. camphor in 6 oz. fluid sp. vini rect. 60 over proof, *i. e.* in its own weight of spirit. He finds, however, that in winter part of the camphor is deposited. Probably Dr. Rubini, living in Naples, never experienced this objection to so strong a solution.

"*Pondere*" says the term "Rubini's Camphor" has been applied by a homœopathic house in the north to ordinary camphor pilules, he supposes "in the exercise of homœopathic licence."

[22.]—COSMETIQUE.—Two parts wax and one part oil, melted together, and coloured to the desired shade by grinding or rubbing up in a mortar brown umber with oil. Or, two parts beef suet and one part wax, and coloured as above. —GIVE AND TAKE.

L. R. (Birmingham) recommends the following:—

℞. Adeps præp. melted with a third of its weight of wax in winter or half in summer; colour with fine brown umber; strain. Stir it constantly, and when it begins to thicken, pour it out into proper moulds.

[23.]—COLOURING FOR POMADES.—If *S. W. S.* adds a small quantity of powdered gamboge he will find it a nice colouring ingredient, and unaffected by exposure to light.—B. T. M.

J. Barker (Sudbury) says that Mr. Alfred Allchin supplies an oleum flav. which answers the purpose well for colouring oil yellow, and does not fade from exposure to the light for some months.

J. F. Brown (Dover) says that yellow wax is worth a trial as a yellow colouring if used instead of white wax in proper proportions, and care be taken to select a clean, bright sample.

T. F. Hudson (Exeter) recommends gamboge digested in olive oil for several days, with frequent shakings, and either decanted after settling for a couple of days or filtered.

PULVIS GLYCYRRHIZÆ CO. (*Pharm. Boruss.*).—In answer to *W. T.* (Edinburgh) we give the formula—

℞. Foliorum sennæ 2
Radicis glycyrrhizæ, singulorum pulveratorum partes duas 2
Fructuum fœniculi pulveratorum 1
Sulphuris depurati, singulorum partem unam 1
Sacchari albissimi pulverati partes sex . . . 6

Misceantur.

EASTON'S SYRUP OF PHOSPHATE OF IRON, QUINIA AND STRYCHNIA.—In answer to "*Dispenser*," the following is the formula, as given by Squire (p. 125):—

Sulphate of iron, 2½ oz.; phosphate of soda, 3 oz.; sulphate of quinia, 1½ oz. and 48 grains; strychnia, 24 grains; diluted phosphoric acid, 56 oz.; sugar, 56 oz.; distilled water, *q. s.* Dissolve the sulphate of iron and the phosphate of soda in separate portions of water, mix the solutions, collect the precipitate, wash it, dissolve it and the quinia and strychnia in the phosphoric acid, mix all together, add the sugar to form a syrup.

[24.]—TANNIN IN GALLS.—*F. C.* is desirous of knowing the proportion of tannin in the following galls:—English, Aleppo, Mecca, Chinese and Japanese.

[25.]—FUMIGATION.—"*Inquirer*" wishes to know the best method for fumigating rooms after fever.

[26.]—CHLORAL HYDRATE.—What is the dose of chloral hydrate and in what diseases is it generally administered?—CHEMICUS.

[27.]—BENZINE.—Can chemists sell benzine, for cleaning purposes, in 6*d.* or 1*s.* bottles without having a petroleum licence?"—CHEMICUS.

[28.]—SYMPATHETIC INK.—*J. H. B.* would feel obliged if any of our readers would furnish him with a good recipe for sympathetic ink which will become legible upon the application of steam or heat.

[29.]—QUININE MIXTURE.—*A. P. S.* wishes for a formula for a quinine, sarsaparilla and dandelion mixture, with the dose.

[30.]—HAIR-OIL SCENT.—*G. C. W.* asks for a good hair-oil scent formula. It must not contain ess. limonis or be too costly.

[31.]—TOOTH PASTE.—*L. R.* would be glad of a good recipe for making cherry or rose tooth-paste that will *not* ferment.

[32.]—DENTISTRY.—*S. S.* would be glad of information as to the qualification required to take a "surgeon-dentist's" diploma, and the best books treating of the subjects taken up in the examination.

⁂ Several queries have been received which have not been accompanied by the name and address of the senders, in compliance with the regulations printed at the head of these columns.—ED. PH. J.

Correspondence.

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

Pharmaceutical Titles.

Sir,—As you have given a place in your Journal to the remarks of "An Aspirant to the Major," I would submit the following facts to your kind consideration:—

Up to my fourteenth year I received the education of a gentleman; then, being unfortunately deprived of the indulgence of further school-training by the death of my father, I was apprenticed to a chemist in the year 1860, when the watch-word was "push on" and time was occupied by work and bed. After a five years' apprenticeship and six years' assistancy under these unfavourable circumstances, I have, by dint of perseverance and unwearied attention to study, succeeded in passing the Modified Examination, only to find that my position will not permit a further outlay of time and money for the Preliminary, Minor and Major. Am I not to be excused for wearing the hardly earned plume of

Associate of the Pharmaceutical Society?

Sunbury, September 26th, 1870.

Sir,—I should like, as a "Major man," to express a hope that Pharmaceutical Chemists will make an effort to obtain a title sufficiently distinctive to recompense them in some degree for their labours. The principal facts of the case have been very clearly stated by "An Aspirant to the Major," and it is not only those who aspire to, but also those who have passed the higher examination who are interested in the subject.

Until about two years ago, membership of the Society was an honour granted only to Pharmaceutical Chemists, and the terms were generally regarded as synonymous; then, perhaps, the title was sufficient; but, for the good of the Society and to prevent opposition to the "Pharmacy Act," membership was thrown open to all chemists and druggists in business and, now the difference between the numerous titles of the Society, so nearly alike, is scarcely understood by the trade itself, while it certainly never will be by the public at large. The creation of the new titles would in no way interfere with existing interests, therefore it need cause no jealousy, as the examination would be open to all, and those who have the intellect might also have the title. "Omega," at the commencement of his letter, satirically criticizes the vanity of those who desire the title of "Fellow," and shortly after falls into the same weakness himself, complaining that a flaming diploma is not awarded to the Modified. For the admission that he would grant what we ask without a moment's reflection, I am grateful, and hope it will be borne in mind. I also quite agree with him on another point, which is, that unless some real advantage be given to those who pass the professional examination the number who enter for it will ultimately fall off. In fact, I know several who would readily attempt it, if any reasonable advantage would be gained by so doing. Your correspondent makes a statement which I believe to be incorrect, namely, that the passing of the Modified involves a yearly subscription. I always understood that the expenses cease with a nominal examination fee.

In conclusion, I would ask "Omega" whether, solely on the ground that knowledge should make men humiliate themselves, he could justly object to a distinctive title as a reward for hard study and no inconsiderable expense? In reply to his quotation, I would recall to his memory another one equally important, about "giving honour where honour is due."

I hope this subject will be fully discussed,—not in a party spirit or in one of jealousy, which would break the unity of the Society and endanger its prosperity,—but as a matter of justice to those who have passed the Major and as an incentive to those who aspire to do so. M.P.S.

Sir,—Respecting pharmaceutical titles, would it not be well for "Omega" and his critics to display rather less asperity? I owe my membership to the mere fact of being in business before July, 1868, but think it really hard that those who pass the Major Examination have not a title manifestly superior to mine. I would therefore support the movement for urging the creation of a class of Fellows, to consist of all who pass or have passed the Major Examination, and of the founders, among whom I would include all who were members before the passing of the first Pharmacy Act in 1852. The case of "Modified Men" also presents some degree of hardship, but I apprehend it is only what is almost necessarily consequent on the passing of any such law as the Pharmacy Act, introducing a new era in pharmacy. However these gentlemen may console themselves with the reasonable prospect of reaping the benefit of it in years yet to come, when the Act shall have had time to produce its natural result of diminished competition.

An Unexamined Member.

Sir,—Permit me to add my quota to the discussion now going on in the pages of the Pharmaceutical Journal relative to the advisability of establishing a Fellowship. For some time I have held the opinion that such a course would be the best that could be followed under existing circumstances. In the first place, I consider it would tend to unravel the mystery which at present shrouds all pharmaceutical qualifications and titles in the public mind; secondly, it would tend to restore the confidence of a large majority of gentlemen (who have passed the "Major" Examination) and allay their dissatisfaction, felt at several clauses in the "New Pharmacy Act;" an Act which I consider was a great injustice to pharmacists, and by which the then Council of the Society certainly forfeited all claims to our confidence. I think there is no question that the title "Royal College of Pharmacists" would have much greater weight with the public than the present title, and convey a better idea of what our Society really is. Most people seem to imagine that the Pharmaceutical Society is of a similar nature to an Oddfellows' or Foresters' Society; in fact, I have several times been asked by persons, noticing my diploma of membership from a distance, to what lodge I belonged; imagine how gratified I feel, at such times, to receive such an acknowledgment for money and time expended in obtaining the said diploma!

I will now, with your permission, offer a suggestion for the consideration of those who hold similar views to mine, as I think there has now been plenty of talking, and it is quite time some steps were taken to promote the object we have in view.

I would suggest, then, that a meeting be called by announcement in the Journal (to be held in town) to draw up a petition for presentation to the Council, praying them to frame a short measure for the ensuing session of Parliament, embodying the following views:—

1st. The title "Pharmaceutical Society" to be altered for the title "Royal College of Pharmacists."

2nd. Founders of the Society, Pharmaceutical Chemists, and all who pass the "Major," to be admitted Fellows of the College, with the title "Pharmacist."

3rd. All who pass the Minor or Modified Examinations, together with those now in business, to be admitted "*Members*," with the title "Chemist and Druggist."

If this could be carried out, it would have the effect of showing to the public that there is a difference between a Pharmaceutical Chemist and one who, having passed or complied with the forms of a Modified Examination, flamingly announces himself as a "Chemist by Examination," "Member of the Pharmaceutical Society," etc. If this course cannot be carried out, then we must use our elective powers in altering the constitution of the Council; we must make it a *sine quâ non* that all who seek re-election must first positively express themselves in favour of these views before we accord to them our support.

Tamworth, Oct. 31st, 1870. T. B. Allkins.

Sir,—It seems "Aspirant to the Major" would fain induce the Council to ignore the nationally-recognized title of Pharmaceutical Chemist, a title obtained, after immense trouble, by a special Act of Parliament.

The assertions of your correspondent must appear extremely vague to those who understand the past history of pharmacy and fully appreciate its present position. The special privileges of Pharmaceutical Chemists are—

1st. The honourable distinction acquired by those who have shown sufficient diligence and interest in their profession to obtain the requisite theoretical and practical information which enables them to pass the examinations of the Society. This can be no vague honour, as it is well known that the Pharmacy Act prevents any, excepting the "founders," from obtaining the honour without examination.

2nd. The recognition and reliance placed in this class of men by the medical profession, though there may be no personal knowledge of the dispenser on the part of the prescriber, further than that he holds the rank and title of a Pharmaceutical Chemist.

3rd. Pharmaceutical Chemists, being the only fully qualified body, are empowered to elect the largest number of their body to the Council, so that as a natural consequence they will always occupy an influential position.

4th. The preference given by Government and local governing bodies to Pharmaceutical Chemists as dispensers or analysts.

5th. Exemption from serving on juries, a matter of no small moment, as our young friend will find when he gets into business.

In conclusion, let me remind any other "Aspirants to the Major" that the examinations, like those of the legal and medical professions, are fitting to the requirements of the times, and adapted more especially to the wants of practical pharmacy, and if young men think they deserve higher distinctions for what they know let them measure their abilities against the standard of any of our learned universities, and there seek the high degrees and diplomas ambition leads them to crave after. PHARMACIST.

*** Our correspondent might also have added that *Pharmaceutical* Chemists are *alone* eligible for the responsible and eminently honourable position of Examiner, and that they *alone* receive the special original diploma with which the public and medical men have been gradually taught to associate high *professional* attainments. No other graduates in pharmacy, whether examined or not, receive a diploma.

In regard to connection with our Society—which is altogether voluntary—"Majors" are eligible, immediately after they have passed, to be elected full *Members* of it; while "Minors" and those who pass the *Modified* Examination are at no time eligible for membership. The highest position the latter can obtain, even when in business, is that of *Associate.*

It is obvious that when the aspiring youths of 1870 shall have become the successful hardworking pharmacists of the future, the anomaly of which they now complain will have, in great part if not entirely, disappeared by efflux of time, and the Society will be constituted of *Members* who will be examined *Pharmaceutical* Chemists, and Associates who will be examined Chemists and Druggists.

This correspondence, which must now *close*, seems to indicate that to avoid being mistaken for an *un*examined competitor, or for one who has passed only the *Modified* Examination, the safest way is to "go in" heart and soul for the "Major," so as to win a *living* title which cannot be assailed or simulated, that of a highly educated and accomplished *professional* man.—ED. PH. J.

LOSS OF SPIRIT IN MAKING TINCTURES.

Sir,—The kind remarks of your correspondent Mr. J. T. Slugg, of Manchester, upon my communication "The Loss of Spirit in Making Tinctures of the British Pharmacopœia" (PHARMACEUTICAL JOURNAL, October 22nd), require some further explanation from me.

The loss of 37·5 per cent. of alcohol (·838) in making tinct. zingib. fort. in accordance with the Pharmacopœia is strictly correct, as the "sufficiency" to produce the measure there ordered is represented by the volume of the final product, plus 37·5 per cent.

Now the Pharmacopœia does not mention (as in other tinctures) the application of pressure to the contents of the percolator, and for the reason that its compilers well knew that such a large quantity of ingredient was only to be exhausted by the displacement of one pint of fluid.

Perfection would seldom have been attained had the percolation been made with 75 per cent. of the alcohol (as tinct. zingib.), or even with the whole of the spirit, and then pressure applied to the ingredients, finally making up the measure.

No pharmacist would (as Mr. Slugg has properly queried) consider as worthless any marc containing such a large percentage of alcohol; he would, of course, resort to pressure or heat for its recovery. By the former method he would obtain 12 per cent., and by the latter, with suitable apparatus, at least 20 per cent. should be recovered.

The subject of hydraulic pressure, as adapted to small pharmacies, I hope shortly to comment upon.

CHARLES UMNEY.

Laboratory, 40, *Aldersgate Street, E.C.*

DRUGGISTS' CHARGES.

Sir,—The following is a copy of a prescription dispensed to-day, and which will be charged more than "half-a-crown," which appears to be the utmost value put on any prescription by some of our "medical friends." It may perhaps interest some of our "pharmaceutical brethren" to see it.

℞. Quinæ Disulph. ʒiss
Acidi Nitrici dil. ʒiij
Aquæ ℥j.

M., signa: A teaspoonful to be mixed with 6 oz. cold water and two tablespoonfuls to be taken twice or thrice a day.

Cheltenham, Oct. 25th, 1870. D. C. L.

THE MAJOR EXAMINATION.

Dear Sir,—Allow me to give, in reply to "A Candidate for the Major," the following extract from the PHARMACEUTICAL JOURNAL of March, 1869:—

"Do not be misled by those who state it to be a 'mere bagatelle.' Get up as thoroughly as you can the different branches mentioned in the synopsis, and, if practicable, spend at least a week in daily attendance at the library and museum of the Society. You will then find it comparatively easy; but if you come up the day before with an idea that it is nothing, and without that preparation, you will probably be numbered with those (of whom there is more than one West-End assistant) who, in failing, have only to blame their own carelessness."

Wakefield, Oct. 31*st*, 1870. THOMAS W. ROMANS.

PHARMACY AND MEDICAL PRACTITIONERS.

Sir,—"Reformer's" letter is so offensively worded, that it entitles us to unusual liberty of speech respecting it, and, as in the attack he leaves open his most vulnerable side, I shall not hesitate to throw a spear.

We are charged, I understand, with "prescribing," high charges, and "general insubordination" to the profession. Well, I suppose, to the first charge we must plead guilty; and, speaking for myself, I wish I were more guilty of this offence, and, for these reasons:—Firstly, I consider myself quite as competent as some medical men to deal with small matters. If the parties applying to me are satisfied with the aid they obtain, and they ought to be the sole judges of their own affairs, it is not for medical men to feel aggrieved because they will not accommodate themselves to public requirements.

Secondly, because the medical man frequently keeps what he calls an "open surgery," where he vends pennyworths of senna, salts, etc., to servant girls, and yellow ochre for the joiners' planes.

Now, as to high charges for dispensing, I believe the usual charge for an 8-oz. mixture, coming from a surgery, is 2*s.* 6*d.* exclusive of an additional charge for investigating the patient's complaint at the surgery; whereas the druggist's charge for the same mixture averages from 1*s.* 6*d.* to 2*s.* at the most; it is usually infinitely better prepared, more neatly and attentively finished, probably contains very superior ingredients, and has not been put together by his wife or by a man who also serves as groom.

A surgeon of standing, extracted a guinea from my pocket in less than five minutes, for an opinion upon a rather trifling matter, although I called at his house for it, and he knew me to be a druggist; on the other hand, a perfect stranger, passing through the town, came to me with his wife and family, and was surprised that I did not take cognizance of his being a medical man and make a large reduction upon the mixture and other things he was taking. The acquisitiveness of druggists is not to be compared to that of the medical man—M.D. shall I say?—who bargains with "Reformer's" incompetent druggist that he is to get for 9*d.* that for which he himself charges his patient 2*s.* 6*d.*, without even the trouble of sending it home.

As to the third charge, I consider myself and my fraternity quite equal to "Reformer" in education, the polite arts and morality. We take our places and perform our office in society on equal terms, and I hope we shall always possess sufficient spirit for the maintenance of our dignity, and not stoop to the dictation of any man. Law and prudence demand that a third party should stand between the Palmers, Pritchards and Monks of the profession and their patients; a man better qualified than they, to dispense prescriptions, who could correct errors, give evidence as to medicine prescribed, and, in many cases, prevent "dark deeds." Are we quite sure that death has never unwittingly lurked in a bottle emanating from a surgery, and his dread presence at the bedside of the patient been accounted for as "unfavourable symptoms set in!" "Quite what I expected from the first," etc.? I believe that the public and Government have only to be well instructed on this head, to see the propriety of taking dispensing out of the hands of the faculty as far as possible, and handing it over to persons exclusively educated for the purpose. Finally, having been in the business thirty-seven years, and educated in the first houses, I am of opinion that as a whole, and looking at the limited nature of the sale of drugs, most businesses are preferable to that of a chemist and druggist, notwithstanding the great profits we get.

I append a specimen of prescribing by the faculty, which I call "grape shot." I make no remarks upon it, except that the complaint which it is intended to cure must be of a peculiar and ramified character.

"Nemo me Impune Lacessit."

℞. Liq. Ammon. Acet. ℥iss
Potas. Nitrat. ℈ij
Syr. Tolut. ʒij
Mucil. Acaciæ ℥j
Sp. Æther. Nitr. ʒj
Oxym. Scillæ ʒiij
Æther. Chlor. ♏xx
Tinct. Opii. Co. ʒij
Vin. Ipecac. ♏xx
Aquæ ad ℥vj. M.
Ft. mist. cujus cap. coch. jss magn. ter in die.

Feeding Bottles.

Sir,—Possessed of a mind somewhat addicted to the "curious," I was induced, by the perusal of Mr. Balkwill's letter, to try an experiment or two, to ascertain how far the *india-rubber* portion of a *feeding-bottle* was concerned in the production of the poisonous compound, so detrimental and sometimes fatal to the *little ones.*

To this end a portion of india-rubber tube was immersed in some fresh milk and exposed to the same treatment it would undergo in an ordinary feeding-bottle, for the space of forty-eight hours; during this interval it was examined several times, and although the character of the milk had changed, there *was not* the faintest trace of sulphuretted hydrogen. The tube was then removed, wiped with a cloth, cut open, and thoroughly examined, but no change whatever had taken place.

The milk was again examined, after the lapse of some hours more, and found to be in a state of decomposition, giving plain evidence of the formation of sulphuretted hydrogen, but without the presence of india-rubber.

It is evident, therefore, that this poisonous compound is not produced by the teat or tube, but is, *de facto*, the product of milk decomposition, which takes place entirely independent of the india-rubber.

The theory "that the sulphur of the india-rubber acted on the hydrogen of the milk," appeared unsatisfactory, and was not sufficient to account for the change.

The probable solution of that part of the question appears to be this,—the casein of the milk is decomposed, the sulphur which it contains combines with some hydrogen, set free in consequence of this decomposition, and this accounts for the sulphuretted hydrogen liberated unnoticed in the feeding-bottle.

But this will not take place if the feeding-apparatus is properly looked after, and the very simple and necessary precautions suggested by Mr. Pemberton adopted.

There is little doubt that a very small portion of already decomposed milk allowed to remain in the tube, teat or bottle, will act as a ferment, and in a very short space of time infect the entire body of fresh milk; and here lies the entire difficulty and danger.

Attention to cleanliness removes the whole; neglect of this alone produces the "poisonous compound" which may induce disease and result in death.

I have thought it would be a wise plan to discard the use of "corks" in feeding-bottles.

Corks (and especially when faulty or fissured) are absorbent, and, unless long-soaked and well-brushed, will contain quite enough decomposed matter to contaminate fresh milk, if allowed to remain long in contact.

In conclusion, I cannot but think that if children are really poisoned by this means, it must exhibit, on the part of those who use the "feeder," an amount of wanton *carelessness*, scarcely credible in an age which boasts of its progress and sanitary reforms.

Brighton, October 25th, 1870. G. G. Hornsby.

Aurora Borealis.

Sir,—The late magnificent display of the Aurora Borealis was witnessed in perfection at Richmond. Viewed from the high ground of Mount Ararat and the Park, the whole hemisphere appeared in a rich, ruddy glow, a vast sea of flickering flame, the beauty of which surpasses any attempt to describe.

The highest perfection of the display continued from about seven till half-past eight o'clock on Monday evening the 24th ult., suggesting the idea of a tremendous conflagration. The fire brigade turned out, but after scouring the country from Mortlake to Brentford, returned without having extinguished the "awful blaze."

On the following evening a repetition of the phenomenon occurred, and lasted from about half-past six until nearly eight o'clock, when the brightness gradually declined.

At early dawn on the morning following each of these displays, beautifully illuminated clouds were observed towards the eastern horizon, much resembling in appearance those tender cirro-cumuli, surrounded by a bright atmosphere, sometimes seen on a calm summer evening.

By a remarkable coincidence the 24th of October is the anniversary of "one of the most brilliant auroras ever known in this country," noticed by Mr. Glaisher, October 24, 1847, and we shall probably be favoured with records of the magnetic storm by the electricians at the Kew Observatory. See Humboldt's 'Cosmos,' vol. i. p. 188.

R. Goodwin Mumbray.

"Student X."—The salary that might be expected for services in a laboratory would depend more upon the practical competence possessed than upon the mere possession of the degree of B.Sc.

F. J. B., Major Associate, is requested to communicate with the Editor respecting his letter, as no answer has been received to a letter sent to the address he named.

W. D. Williams (Salisbury).—Prussiate of potash is not a poison, nor is it included in Part I. of the poison schedule, therefore it is not subject to the regulations as to labelling, etc.

Owen Jones (London).—In our opinion they certainly do.

"Druggist" (Birkenhead).—According to the terms of the Act, we should consider the article mentioned as being liable to duty. In reference to a similar article, the Inland Revenue Office has taken a contrary course, though it is now considered to have been wrong in doing so.

R. J. O. (London).—Elixir of garus is a preparation of the French Codex. It is also given at p. 449 of Dorvault's 'L'Officine.'

Communications, Letters, etc., have been received from Mr. W. D. Boon (Lynn), Mr. A. H. Mason (Liverpool), Mr. H. H. Pollard (Ryde), Mr. Perkins (Norwich), Mr. J. Watts, jun. (Sheffield), Mr. R. G. Mumbray (Richmond), Mr. T. Appleton (Fulham), Mr. A. W. Bennett (London), "Registered Chemist and Druggist" (London), J. C. (Wakefield), "Agitator," "The Original Modified Man," "An Associate," L., A. E. J. (Norwich), J. E. T. C. (Manchester).

The following journals have been received:—The 'British Medical Journal,' Oct. 29; the 'Medical Times and Gazette,' Oct. 29; the 'Lancet,' Oct. 29; 'Nature,' Oct. 27; the 'Chemical News,' Oct. 28; 'Journal of the Society of Arts,' Oct. 27; 'Gardeners' Chronicle,' Oct. 29; the 'Grocer,' Oct. 29; the 'English Mechanic,' Oct. 28; the 'Canadian Pharmaceutical Journal' for October; 'Journal of Applied Science' for November; the 'Educational Times' for November; the 'Practitioner' for November; the 'Food Journal' for November.

HOSPITAL PHARMACY 120 YEARS AGO.

A most interesting account of the early history and practice of St. Thomas's Hospital is given by Dr. W. H. Stone in the first volume of a new series of the Reports of that Hospital just published. The facts are obtained from several different sources, and amongst others a most quaintly written book, which emanated from the shop of one "E. Duncomb, in Duck Lane, Little Britain," in 1741, and bears the title of 'The Physical Vade Mecum, or Fifth Gift of Theophilus Philanthropos; wherein is contained the Dispensatory of St. Thomas's Hospital, with a catalogue of the Diseases, and the nature of their cure, prescribed in the said Hospital;' a book peculiarly interesting to pharmaceutists, as showing how unexpectedly great has been the progress of the science they cultivate within the space of a single century. Dr. Stone tells us that the frontispiece portrays a fourfold conversation which is being carried on between the Patient and Doctor, Death and the Deity. A coffin and a skeleton in the foreground serve as emblems of mortality, and the doctor, after seeking the Divine assistance, is represented as having produced the following prescription, which is written on a scroll in his hand:—

"From infection sprung, it is a fever strong,
Unless with present speed a vein be open,
Thou must die or bleed.
VS ad ℥ix statim,
Episp. Nuchœ quam primum.

℞ Bol. Alex. ℈j cum
Nitri. gr. xij, 6tâ quâque horâ sumend.
Jul. Card."

The author of the work says of himself, that "whether ever it will fall to my lot to be much concerned in the curative or practical part of this Art I at present know not; and can't think upon it but with some kind of Anxiety or Fear! yet since God put it into my mind, and inclined my heart towards obtaining knowledge thereof, I have not been idle, as tho' I hoped to receive it by Revelation, or might obtain the Art of Healing by Inspiration; but on the contrary, have used what industry and diligence I could in acquiring the previous knowledge needful hereto; and after some years attending the Academy of Liberal Arts and Sciences under the most Learned, Worthy, and Pious Professor Eames; various courses of Anatomy by the Incomparable Dr. Nicholls, Professor of Anatomy at Oxford, and of Chemistry by the Ingenious Dr. Pemberton, Professor of Physic at Gresham College, I entered myself Physician's pupil at St. Thomas' Hospital on the 2nd March, 1728, in order to acquire the Practical Art of Physick." This estimable gentleman attended regularly the "Apothecaries' shop, which is a very neat, pretty place, well stored with medicine; besides which, it is ornamented by the Apothecary, who is a very Judicious, Prudent, Curious, and Ingenious Gentleman, by a Museum or Cabinet of various curiosities, and a large handsome framed skeleton, without Decorations and Ornaments." The actual pharmacopœia of the hospital was, at the time our author published his book, made up of a printed work bearing date 1718, and various old manuscripts, and the remedies used were, some of them, as follows:—

Aqua Limacum, or Snail Water.

Directed to be thus made:—

℞ Garden Snails, cleansed and bruised, 6 gallons.
Earthworms, washed and bruised, 3 gallons.
Common Wormwood, Ground Ivy and Carduus, each ½ lb.
Pennyroyal, Juniper Berries, Fennel Seeds, Aniseed, each 1½ lb.
Cloves and Cubebs, bruised, each 3 oz.
Spirit of Wine and Spring Water, each 8 gallons.

Digest together for twenty-four hours and draw off in a common alembick. This compound was said to be "well-contrived for cheapness and efficacy, and for persons whose circumstances and manner of living have not habituated them to any delicacies, it is as good a snail-water as can be made." How the fashions have changed!

Salivation was the very commonest practice, the calomel bolus containing 20 grains for a dose, "the common bole for salivation." Another bolus, "the Turbith," contained 5 grains of calomel and 3 of tartar emetic. There is a significant "N.B." appended to this last prescription that "in the working of this vomit it is needful to drink plentifully of Carduus Tea, through defect of which I knew one that Died." Marvellous must have been the effect of the "Viperian Bolus," which contained ʒss of the Flesh of Vipers in powder, the dose being two boluses a day. Viper's flesh, with opium in addition, were the chief ingredients of the "Venice Treacle," or Andromachus's electuary. But this was almost surpassed in delicacy by the "Expressio Millepedum," or expression of woodlice, made of three ounces of lice in spirit and water. Several well-known names occur, Pilulæ Cociæ Majores and Minores; Matthews; Rudius' and Ruffy's, or the Common Pill. The extent to which salivation was pushed may readily be gathered from the statement that "Some spit plentifully, viz. 5, 6, or 7 pints in 24 hours; with others it passes off more by sweat and urine than by mouth; which things must be observed with regard to the Patient's Welfare."

There appears to have been a special "powder for diseased eyes, made of glass what quantity you please," well pounded. It was used to "clear the eye of specs which cloud the sight by blowing thro' a Quill some of the powder upon the Parts affected, though it is not often used." A favourite diuretic was the tinctura Veneris of Boerhaave; it used, according to all accounts, to work wonders. Our author found that by its aid he cured one case of dropsy completely; "and a prodigious Discharge of Urine being excited, that it ran as out of an open Cock, upon which the Integuments of the abdomen became so loose that they might be wrapt over one another. The Patient grew perfectly well, and enjoyed a good state of Health many years after." Dr. Stone declares the following to be the gem of the whole collection. It is described as a "good medicine," and directions were given that if the dose be too noisome, it may be lessened and repeated the oftener." Here it is: Take of fresh Horse Dung ℥vj; Penniroyal water ℥xij; Treacle water ℥iv. Infuse them warm, and to the strained Liquor add Mithridate ℥ij; White Sugar, a sufficient quantity to sweeten it: drink half a Pint twice a day. Dr. Stone exclaims, Can we wonder at reactionary movements in favour of infinitesimal doses? What has often surprised us is the fact that the sick and suffering should ever have been induced to swallow so many beastly compounds. We imagine the fact to be in great measure explained by the secrecy with which the apothecary surrounded his concoctions. Be that as it may, the reminiscences of the not very long past, enable us to institute a most satisfactory comparison as regards the doings and knowledge of our immediate ancestors and ourselves relative to the practice of pharmacy, and give us much encouragement for the future. Whether our practice at the present day will cut, to the generation to come, as sorry a figure and excite as great a laugh as does that of the last century, is a matter upon which we may freely speculate. Who will venture to say with any confidence in this age of rapid progress, when to-morrow revolutionizes the things of yesterday, that this may not be the case?

CONTRIBUTIONS TO THE HISTORY OF THE ACONITE ALKALOIDS.

BY DR. TH. HUSEMANN, OF GÖTTINGEN.

The researches made by the author, in conjunction with Professor A. Husemann, on plant-products, enable him in answering the question proposed by Flückiger to offer some additional remarks. In the first place he agrees that the name pseudaconitina ought to be retained, and he prefers it to nepaline, in which is involved a theory as to its origin. Aconitina is a body whose physiological action is better understood than its chemical relations.

The physiological actions of pseudaconitina and of aconitina, when applied externally, differ in this respect; the former acts similarly to veratria, the latter not. Taken internally, pseudaconitina is given in much smaller doses than aconitina, and then often acts fatally. They both depress the action of the heart and lungs, and act similarly, but unequally, on the bowels.

Adelheim could perceive only a difference in strength between aconitina and pseudaconitina derived from *Aconitum ferox*.

Keeping these distinctive characteristics in view, we may conclude that "so long as aconitina has been used in Great Britain, pseudaconitina has most frequently been used in the place of it."

Turnbull's aconitina was said by him to cause numbness and contraction, with a feeling of weight lasting from two to twelve hours when applied externally. But soon after its introduction differences in the quality of the alkaloids were noticed; some being much stronger than others, some dilating, some expanding the pupil. So late as 1854, Hilton and others were inquiring as to the kind of aconitina that could have produced effects on the skin similar to veratria.

Fleming found that 6 milligrams exhibited by the stomach, or 5 milligrams subcutaneously, caused death in 11 minutes. The alkaloid was made by T. and H. Smith from the leaves of *Aconitum Napellus*.

Schroff's experiments with Morson's aconitina show results very similar.

Headland, using an alkaloid prepared by himself from *Aconitum ferox*, found 6 milligrams to kill a cat in 20 minutes.

Exact experiment as to the action of pseudaconitina on men is confined to one by Pereira, who found 15 milligrams to have a violent and dangerous effect.

It is clear, then, that the English aconitina does differ from that of Geiger and Hesse. This is also proved by the want of activity as a topical application evidenced by the German alkaloid.

The author is decidedly of opinion that pseudaconitina should not be regarded as a mere impurity, but as the real, active principle, for which the Swiss aconitina has, without cause, been substituted. He thinks we ought to endeavour to introduce pseudaconitina as well as aconitina into the dispensary, and discover a method of preparing the first in a pure state, whereby we should be in a position to have a constant preparation of real efficacy in the treatment of neuralgia.

From his own experience he states that rabbits have survived from 1 to 2 grains of German aconitina dissolved in water, and introduced through the mouth; *i.e.* from twelve to twenty-four times as much as would be required of pseudaconitina. Others have quoted similar experiences.

He cannot admit that English aconitina owes its virtues to an impurity, but rather that pseudaconitina is the substance to which English aconitina owes its reputation; in which case the term impurity would, of course, be inappropriate. Since 1864 even, two kinds of aconite alkaloid were obtainable in the London market; the one, pseudaconitina, sold as pure aconitina; the other, aconitina, of presumed foreign manufacture, impure and useless. Of this fact both pharmaceutists and doctors have more or less been aware for some time.

Probably the present state of the aconitina trade is occasioned by the scarcity of bikh root in the English market, from which we believe pseudaconitina is derived. Headland has stated that with great care pseudaconitina may be extracted from *Aconitum Napellus* in very small quantity. T. and H. Smith appear to have done this. The method adopted by Morson is not known, he having declined to give information thereupon; further than that his method is a peculiar one. Perhaps after all his method depends on the selection of the roots operated on.

As regards the colour tests of these alkaloids, Husemann remarks that according to Adelheim, the colour reaction (phosphoric acid?) is as well marked with pseudaconitina as with aconitina.

Great doubt still hangs over the various other alkaloids said to have been derived from the genus Aconitum.

Buckheim and Lisenmenger seem to have established a distinction between napellin and acolyctin, and have proved that napellin and lycoctonin are inferior in activity to aconitina.—*Abstract of Paper in Neues Jahrbuch der Pharmacie.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

ACIDUM TANNICUM. $C_{27}H_{22}O_{17}$. Powdered galls are damped with water, and then made into a paste with ether. On submitting the mass to pressure a strong solution of tannin is obtained, which is evaporated at first spontaneously, and at last in an oven at the temperature of boiling water. The tannin is then left in the form of vesicular masses, made up of thin glistening scales. The amount of tannin obtained varies from 30 to 60 per cent. of the weight of the galls employed.

Tannin is uncrystallizable, very soluble in water and in rectified spirit, and gives a yellowish-white precipitate with solution of gelatine. [Contrast these with the characters of gallic acid.] It is almost insoluble in pure ether, but in a mixture of ether and water readily dissolves.

It is soluble in about six times its weight of glycerine; in less if warmed. It gives precipitates with almost all metallic solutions, and with most of the alkaloids. If free from adulteration, it is completely soluble in rectified spirit, and burns without leaving a residue.

The amount of tannin dissolved in a liquid, *e. g.* a vegetable infusion, is usually estimated by ascertaining the amount of a solution of gelatine of known strength, which is precipitated by a given quantity of it.

Tannin is a "glucoside," that is, when boiled with acids, or when under the influence of the peculiar ferment contained in galls, it splits up, yielding glucose among the products of its decomposition. [See gallic acid.] There are several varieties of tannin; this from oak galls (gallotannic acid) is distinguished by giving a *bluish*-black precipitate with ferric salts; another kind from catechu (mimotannic acid) gives a *greenish* compound with ferric solutions.

Acidum Tartaricum. $H_2C_4H_4O_6$. Acid tartrate of potash is first boiled with chalk until the effervescence has ceased and the liquid is neutral. There is then formed a precipitate of tartrate of calcium, and a solution of neutral potassic tartrate.

$$\underset{\text{Acid tartrate of potassium.}}{2(KHC_4H_4O_6)} + \underset{\text{Carbonate of calcium.}}{CaCO_3}$$

$$= \underset{\text{Neutral tartrate of potassium.}}{K_2C_4H_4O_6} + \underset{\text{Tartrate of calcium.}}{CaC_4H_4O_6} + \underset{\text{Carbonic acid.}}{H_2O, CO_2}.$$

To the liquid is added a solution of chloride of calcium; this causes a further precipitation of tartrate of calcium:—

$$K_2C_4H_4O_6 + CaCl_2$$
$$= CaC_4H_4O_6 + 2KCl.$$

The mixed precipitates are collected, drained, washed, and decomposed by digestion with diluted sulphuric acid:—

$$CaC_4H_4O_6 + H_2SO_4 = H_2C_4H_4O_6 + CaSO_4.$$

Most of the sulphate of calcium produced is removed by filtration; the tartaric acid crystallizes from the concentrated solution.

Tartaric acid is recognized by blackening, when heated, with an odour like that of burnt sugar. It gives a white crystalline precipitate ($KHC_4H_4O_6$) with solution of acetate of potash. Admixture of oxalic acid would be detected by the solution giving a precipitate with one of sulphate of lime; alum or any sulphate, by forming a precipitate with chloride of barium; sulphate of lime, by giving a precipitate with oxalate of ammonia, also by leaving a residue when burned with free access of air.

7·5 grams ($\frac{1}{20}$ of a gram-molecule) of tartaric acid require, for neutralization, 100 cubic centimetres of the volumetric soda. 100 c.c. vol. solution contain $\frac{1}{10}$ of a gram-molecule, or 4 grams of $NaHO$.

Tartaric acid offers an example of *isomerism*. There are three (or perhaps four) acids all represented by the same chemical formula, being of the same composition, but differing from one another in chemical and physical properties. Dextrotartaric acid, the common kind, rotates a ray of polarized light to the right; lævo-tartaric acid to the left; and racemic acid, which is formed by the union of the two former, is inactive. Bodies which thus have the same composition, but exhibit characteristics which show that they are not identical, are said to be isomeric. The differences are considered to be due to a difference of constitution, or manner of arrangement of their constituent atoms. The particular kind of isomerism exhibited by the modifications of tartaric acid is sometimes called physical isomerism or allotropy. The related bodies are convertible one into the other, and differ chiefly in mechanical, slightly in chemical properties.

Oxalic Acid.—Appendix I. The oxalic acid of commerce is made in two ways. Sometimes sugar is boiled with slightly diluted nitric acid: nitrous fumes are evolved, and on cooling, the oxalic acid crystallizes out. Saccharic acid, $C_6H_{10}O_8$, is formed at first, and is afterwards converted into oxalic acid, but the reactions cannot be shown in any simple or probable equation. A large quantity is now made by roasting sawdust (impure cellulose) with a mixture of caustic potash and soda. The resulting alkaline oxalate is boiled with lime, which gives insoluble oxalate of calcium, and this is converted into the acid by digesting with diluted sulphuric acid.

[§ Test. It is entirely dissipated by a heat below 350° F.] The commercial acid almost invariably leaves a small residue of sodic carbonate. Oxalates give a white precipitate with chloride of calcium, which is not dissolved by the addition of acetic acid: when heated they give off carbonic oxide, CO, and leave a residue of carbonate of the metal. Neutral ammonium oxalate, heated gently, gives up water and furnishes a white, nearly insoluble, slightly volatile residue of oxamide.

$$\underset{\text{Oxalate of ammonium.}}{(NH_4)_2C_2O_4 - 2H_2O} = \underset{\text{Oxamide.}}{(NH_2)_2C_2O_2}.$$

Oxalic acid is resolved by heating it gently with glycerine into formic acid and carbonic acid gas.

$$C_2H_2O_4 = CH_2O_2 + CO_2.$$

The glycerine takes no obvious part in the decomposition; but without it a much higher temperature is requisite. Oxalic acid and oxalates, heated with strong sulphuric acid (*q. v.*), evolve carbonic monoxide and dioxide gases. The latter may be separated from the former by passing the mixed gases through solution of potash. The CO_2 is absorbed, the CO left untouched.

Oxalic acid is dibasic and therefore gives two series of salts, neutral and acid.

Crystallized oxalic acid . .	$H_2C_2O_4, 2H_2O$.
Neutral potassic oxalate . .	$K_2C_2O_4, H_2O$.
Acid potassic oxalate (Binoxalate of potash) . .	HKC_2O_4, H_2O.

But it also gives another class of compounds formed by the union of the normal acid oxalates with oxalic acid.

Quadroxalate of potash (Salt of sorrel) $\left.\begin{matrix} KHC_2O_4 \\ H_2C_2O_4 \end{matrix}\right\} 2H_2O$.

The antidote to oxalic acid is chalk or whiting.

THE USE OF AMMONIA IN SNAKE BITES.

The following has been sent to the *Pall Mall Gazette* by a correspondent signing himself "An American":—

"While a temporary resident of one of the Southern states of the United States, where rattlesnakes are numerous, a man who had been bitten by one of these venomous reptiles sent for the writer to visit him. Being absent at the time, my visit was delayed some twelve hours. I found the patient was wounded over the top of his shoe, just above the instep. His leg was swollen to an enormous extent up to the body; and, having no pretensions to medical or surgical science, I sent immediately, a distance of twelve miles, for a medical man. In the meantime, as the case seemed certain to terminate fatally, and having read in some newspaper that ammonia was a sure antidote for snake poison, I determined upon an immediate experiment. Having no instruments, with the patient's razor I cut the wound entirely out, applied to the part cotton saturated with a mixture of ammonia and olive oil, and renewed the application every thirty minutes. I also gave him ammonia, diluted with whisky, in large doses, every thirty minutes, and applied a bandage to his thigh, as tightly drawn and as close to the body as possible. Under this treatment, to my utter astonishment, the patient recovered. Lest this case may be regarded as exceptional, I would add another, which soon after came under my observation, to confirm it, in which a rattlesnake so perfectly grappled his fangs through the ball of a man's little toe (as it projected through a hole in his shoe), and so firmly fastened upon it, that the head of the snake had to be cut off to disengage it. In this case also some eight hours elapsed ere I was called to it; and on approaching the patient such was his agony from the wound he begged me to 'take his rifle and shoot him.' The leg was terribly swollen to the knee, but on cutting out the wound (the entire ball of the toe) and applying the same remedies as in the first case, this patient also recovered.

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Continued from page* 128.)

III. *Acid Ammonium Carbonate.*

History.—Berthollet announced his discovery of the acid carbonate in 1806, in his 'Troisième Suite des Recherches sur les Lois de l'Affinité,'* and gave an excellent account of its properties. Dalton, Phillips, Rose, St. Claire Deville and others, have since then added materially to our knowledge of this salt.

Preparation.—It is obtained by exposing any other carbonate of ammonium to the air; by treating the half-acid or the commercial carbonate with water or with aqueous alcohol, or by treating the normal carbonate with aqueous alcohol; by cooling sufficiently-concentrated aqueous solutions of the half-acid or the commercial carbonate, when it crystallizes out; by treating a solution of any other carbonate of ammonium with carbonic anhydride; and by mixing together carbonic anhydride, ammonia and water, the first being in excess. A modification of the last method is to distil the acid carbonate at a temperature not exceeding 62° C. The operation is a very slow one, but, if the acid carbonate is more rapidly converted into vapour, the process fails. In any case, some of the product will be impure.

Sensible Qualities.—Acid carbonate has a cooling, saline taste, not at first ammoniacal, and has no smell when dry.

Form.—It occurs in the form of powder; in crystals, transparent or opalescent, obtained from water; and in crystalline semi-transparent cakes.

Crystalline Form.—A great deal has been written on this subject. The crystals belong to the right prismatic system, and exhibit the faces of the three orders of rhombic prisms, as well as the three pairs of faces of the right rectangular prism. When the crystals form in a solution of commercial carbonate, cooled a little below its point of saturation; or in a not too-concentrated solution, prepared by pouring hot water over the carbonate in a flask and then corking the flask; or in a solution of commercial carbonate, moderately strong, which has been treated with a stream of carbonic anhydride, they are hard and brilliant, and have the general contour of a flattened ovoid. The flatness of the crystals varies according to the strength of the solution in the more basic carbonates of ammonium. Generally there are to be seen among the ovoid crystals deposited from a cooled saturated solution of commercial carbonate, some long, essentially four-sided crystals with truncated summits. These do not differ in composition, or otherwise in form, from the first-described crystals, and give way to, or else are transformed into, the other variety when left for a time in their mother-liquor. When a warm saturated solution of acid carbonate is made by digesting the acid carbonate with the water in a firmly-closed bottle, the crystals which form are opaque, and first appear as simple rhombic prisms with dihedral summits. These, however, rapidly thicken, and then might be described as octahedrons on a rectangular base. They have the same faces as the previously mentioned forms. They readily cleave into long rhombic prisms. Their opacity is evidently due to their having a composite structure and retaining mother-liquor in their interstices. When a very concentrated solution of the commercial carbonate is made in warm water in a flask, and especially when some effervescence is permitted to go on, and the solution allowed to cool, crystals, very different in appearance from those already described, make their appearance. They generally form at the surface of the solution, and remain hanging vertically; and present a remarkable appearance from being closely packed together, and all extending down into the solution to an equal depth, with their lower edges parallel to the surface of the solution. In other cases these crystals form at the bottom of the vessel, and this generally happens when the crystals are prepared by taking a solution of commercial carbonate which has already yielded a good crop of crystals, and dissolving in it, by the aid of heat, as much, or nearly as much, fresh commercial carbonate as possible. When the crystals form at the bottom of the vessel, some rest on their broad sides, but most of them stand up, closely packed in groups, nearly parallelly arranged, with their angles, not their edges, projecting upwards. They have not the transparency and brilliancy of the ovoid crystals, but this is evidently due to the peculiar character of their faces, and not to the existence of any interstices in them. They have the form of thin, rectangular, and nearly equilateral plates, with or without the corners slightly cut off, with their broad faces crinkled and with bevelled edges. The faces forming the edges and truncated corners of the plates, are those of the different orders of rhombic prisms apparent in the previously-described crystals. The broad faces of the plates are not at all like true crystalline faces. They are not only crinkled or waved, but are not always in their general bearings parallel to each other and to the normal macro-pinacoids of the rectangular prism, the places of which they occupy. Rose has described crystals, also right rhombic prisms, which have different angular measurements, identical with those of the corresponding potassium-salt. These, however, he only succeeded in obtaining once. Deville at one time thought that he had seen oblique rhombic prisms of acid carbonate produced by the decomposition of the half-acid carbonate, but he has since come to the conclusion that only one form of acid carbonate exists. The cakes of acid carbonate produced by its own slow distillation, exactly resemble well-crystallized specimens of the commercial carbonate.

* *Journal de Physique*, lxiv. 168.

Chemical Composition.—Rose analysed the acid carbonate prepared in different ways, and obtained results which led him to consider that the following acid carbonates existed:—

$$CO_2OH_2NH_3$$
$$(CO_2)_4(OH_2)_5(NH_3)_4$$
$$(CO_2)_2(OH_2)_3(NH_3)_2.$$

But crystals like those to which he gave the second formula have a composition expressed by the first one, according to Berthollet, J. Davy, Deville and myself. The salt found by him to have the composition represented by the third formula was a product of distillation once only obtained by him in small quantity. For this reason, and from a consideration and repetition of some of Rose's methods of preparing carbonates by distillation, I am disposed to regard the existence of such a salt as extremely doubtful.

Behaviour on Exposure.—It is probably quite fixed in dry air. In ordinary air it is very slowly dissipated, as was pointed out by Dalton. According to John Davy, it is decomposed by the atmospheric moisture, and rendered alkaline. Certainly, the moister it is, the more ammoniacal it renders the air confined with it in a bottle. By exposure to air, the faces of the crystals lose much of their lustre. It is not quite easy to recognize the nature of the change which the salt undergoes by exposure; for example, when the salt has been left for a while in a closed bottle, how is the strong smell of ammonia which is generated to be accounted for? What has become of the carbonic anhydride that was in combination with it?

Behaviour when Heated.—Like the normal carbonate, when heated in a retort, a little of it is first decomposed, and yields a few drops of liquid distillate, at about 49° C., which gradually crystallize in needles; while the rest, getting thus enveloped in an atmosphere of the products of this decomposition, undergoes no change at this heat. At about 60° it is slowly decomposed into carbonic anhydride, water and ammonia, the salt in the retort remaining dry; but when the heat is carried much above 60° C., the salt in the retort gets wet. The effect of heat is therefore thus represented:—

$$CO_2OH_2NH_3 = CO_2 + OH_2 + NH_3.$$

Behaviour with Water.—As was first pointed out by Berthollet, the acid carbonate dissolves in about 8 parts of water, at 15° C. By exposure to the air this solution rapidly loses carbonic anhydride, but, as also pointed out by Berthollet, this loss is soon arrested. Gently heated, it effervesces. The solution placed in contact with solid acid carbonate decomposes it even at low temperatures, large bubbles of carbonic anhydride being formed, as was pointed out by Davy, which adhere to the crystals, and, if the latter are small, carry them to the surface. A saturated solution of acid carbonate crystallizes out when cooled.

Behaviour with Alcohol.—Acid carbonate is very slightly, if at all, acted on by strong aqueous spirit, cold or boiling. The crystals boiled with the spirit are slowly decomposed, as they would be by the heat alone; carbonic anhydride and ammonia escape, and the remaining spirit is left weakened, and with a little caustic ammonia dissolved in it.

Behaviour with Ammonia.—Dry crystals of the acid carbonate are not acted on by ammonia gas, either at ordinary temperatures or that of 0° C. When the powdered salt and strong solution of ammonia are brought together, a hissing sound is produced, the mixture becomes warm, and the salt cakes together and shows little evidence of being dissolved.

By digesting the acid carbonate with the strongest solution of ammonia in a closed vessel, at a temperature of 20°–25°, ammonium carbamate is slowly formed in considerable quantity. The mode of procedure is exactly similar to that already described for converting the normal carbonate into the carbamate; as are also the results, except that, as might be anticipated, the yield of the carbamate is greater. In the first stage of the reaction, by which the carbamate is formed, the acid carbonate and the ammonia probably react, to form carbamate and normal carbonate; in the second stage, the normal carbonate thus formed changes into water, and carbamate, as was explained when treating of the reactions of the normal carbonate. Representing the change by a single equation between the substances employed and those finally obtained, we have—

$$CO_2OH_2NH_3 + NH_3 = CO_2(NH_3)_2 + OH_2.$$

(To be continued.)

CYSTINE.*

This rare substance has the composition $C_3H_7NO_2S$; it crystallizes in the form of six-sided plates, and forms with hydrochloric, nitric and phosphoric acids, definite crystalline compounds.

Dr. Bence Jones has shown that nitrous acid decomposes cystine with evolution of nitrogen, the sulphur it contains being oxidized to sulphuric acid, whilst a non-crystalline substance is left which is precipitable by nitrate of silver, mercuric chloride, or acetate of lead.

The cystine used in the author's experiments was obtained by treating pounded calculi with strong liquor ammoniæ, which dissolved the greater part, then evaporating the solution at a very gentle heat. The cystine which separated was again dissolved in ammonia and recrystallized.

Hydrochlorate of Cystine,—obtained by dissolving cystine in boiling hydrochloric acid, separated on cooling as beautiful needle-shaped crystals, very soluble in water. When thoroughly dried in vacuo over quicklime, the crystals were found not to be readily soluble in water. 0·05 gram of crystalline hydrochlorate of cystine yielded 0·0452 gram of $AgCl$, corresponding to 22·2 per cent. of HCl (calcined 22·5).

When cystine is dissolved in strong solution of ammonia, and a solution of silver nitrate in ammonia added, no precipitate is formed, nor does the solution darken in the cold. When slightly acidified with nitric acid, a canary-yellow precipitate is thrown down. The filtrate blackened when heated, and on filtering off the black precipitate a clear colourless solution was obtained, which was not further blackened when boiled with ammoniacal solution of oxide of silver. On analysis the yellow substance proved to be a compound of cystine with nitrate of silver.

In a subsequent experiment an ammoniacal solution of cystine was boiled with an ammoniacal solution of nitrate of silver. A black precipitate fell which consisted of sulphide of silver. The filtrate from the precipitate of sulphide of silver was subsequently treated with solution of chloride of ammonium to separate the excess of silver. The solution was found not to be precipitated by hydrochloric acid and chloride of barium nor by sulphate of calcium. It is therefore evident that when an ammoniacal solution of cystine is heated with ammoniacal solution of oxide of silver, the sulphur is separated entirely as sulphide of silver, none being oxidized; it is also obvious that no oxalic acid is formed.

Cystine, treated with $NaHO$, and evaporated in a silver basin, gives a reddish liquid; sulphide of sodium is then produced, blackening the basin, and ammonia is copiously evolved. On treating the residue with water, neither sulphuric nor oxalic acids can be detected, but the liquid contains a large quantity of sulphide of sodium with a mere trace of sulphite.

Cystine, heated to 150° C. with solution of caustic baryta in sealed tubes, gives off ammonia, a large quan-

* Abstract from a paper by James Dewar, F.R.S.E., Lecturer on Chemistry, Veterinary College, Edinburgh; and Arthur Gamgee, M.D., F.R.S.E., Lecturer on Physiology at Surgeons' Hall, Edinburgh, published in the Proceedings of the Royal Society of Edinburgh, 1869–70.

tity of sulphide of barium, a smaller quantity of sulphite of barium, and a trace of hyposulphite being formed. No trace of sulphocyanide could be detected.

Cystine was heated for several hours in a sealed tube at 130° C. with an alcoholic solution of potash. At the conclusion of the experiment a small quantity of dark sticky matter was found adhering to the tube, which contained a yellowish liquid. The latter smelt strongly of ammonia, which was separated by distillation. The residue was acidified with dilute sulphuric acid, and shaken up with ether. Ether left a yellow non-crystalline substance, possessed of an indefinite but disagreeable odour. This substance had a strong acid reaction, and was found to contain no sulphur.

When cystine is added to a mixture of tin or zinc and dilute hydrochloric acid, large quantities of sulphurated hydrogen are given off; even after the action has gone on for several days, traces of sulphuretted hydrogen continue to be given off. When treated in the same manner taurine does not evolve H_2S.

It is to be noted that this evolution of H_2S might be used as a test for cystine, care being previously taken to separate any sulphide.

Cystine was placed in water and a stream of nitrous acid gas passed through it. No action took place until the water was heated; it then commenced and proceeded briskly, with abundant effervescence, until the whole of the substance was dissolved.

The clear solution contained a large quantity of sulphuric acid, but not a trace of oxalic acid. When boiled with an ammoniacal solution of nitrate of silver, considerable reduction took place, a beautiful mirror of silver being deposited on the glass. The fluid was again subjected to the action of nitrous acid; still no oxalic acid could be found, and the reduction of an ammoniacal solution of oxide of silver continued.

Cramer believed that cystine was intimately related to the body called Serin, $C_3H_7NO_3$, which is obtained as one of the products of the action of alkalies on silk. Serin, when treated with nitrous acid, yields glyceric acid, as alanine under the same circumstances yields lactic acid, and therefore serin may be looked upon as amido-glyceric acid.

Cramer further believed that cystine was a sulpho-amido-glyceric acid, *i. e.* serin in which hydroxyl has been replaced by HS.

This supposed relation is exhibited below—

CH_2OH	CH_2NH_2	CH_2NH_2
$CHOH$	$CHOH$	$CHSH$
CO_2H	CO_2H	CO_2H
Glyceric Acid.	Amido-glyceric Acid or Serin.	Cystine.

Considering that this relation of cystine to serin really exists, some have argued that on treatment with nitrous acid, cystine should yield glyceric acid. The authors do not admit that this would really be the case, and they refer to the case of sulpho-lactic acid, a body analogous to the supposed sulphur derivative of serin, and giving on oxidation sulpho-propionic acid; if therefore cystine were built up as Cramer supposes, it might be expected that sulpho-acid would be formed on treatment with nitrous acid. But, however carefully the action of nitrous acid was regulated, the sulphur separated as sulphuric acid, thus pointing to a decided difference in its reactions from what might have been expected from the supposed constitution of cystine. Although, not considering the experiments as definitive, the authors assert that glyceric acid is not a product of the action of nitrous acid, and they predict that, in all probability, cystine will be found related to pyruvic acid—to be an amido-sulpho-pyruvic acid. This supposition is based on the near approach of the analyses of the silver salt of the acid obtained by the action of nitrous acid on cystine to the composition of a pyruvate, and on the general character of the oily acid produced.

Supposed Poisoning by the Berries of the Guelder-Rose.—At the adjourned inquiry into the death of a child at Sudbury, referred to on p. 347 of this Journal, the medical men who made a *post-mortem* examination of the body said that they had found the stomach perfectly empty, and that, although they made a careful examination, they failed to detect any poisonous substance in the bowels, or any signs of poisoning. As they could not discover any natural cause for death, they had come to the conclusion that it had been caused by the absorption of the active principles of some narcotic poison. With respect to the berries of the wild Guelder-rose, which, it was suggested, had been eaten by the deceased, they were not aware of any medical work referring to them as poisonous. The jury returned a verdict in accordance with the medical evidence.

What is a Poison?—In reference to the recently reported cases of poisoning by acorns, the *Observer* remarks:—"Boys at school have not unfrequently to mourn the loss of that pretty but unsavoury little pet, a white mouse. The white mouse has an inordinate love for apple, and if allowed slices of apple without discretion will eat until he dies in a fit of something, which may be either colic, or indigestion, or apoplexy; and in its symptoms resembles all three combined. The same fate has often befallen chickens which have been allowed raw rice. The warmth of the crop makes the rice expand, and the chicken is choked in much the same way as a human being would be choked if he were to mix and drink the contents of a dozen white seidlitz papers first, and of a dozen blue papers afterwards, or as the boa-constrictor was choked who swallowed his blanket. And so, too, it seems that hungry cattle will gorge themselves to death with raw acorns, exactly as a starving man might eat himself to death with raw chestnuts or raw potatoes. Out of this fact has arisen an immense turmoil of words, some writers stoutly asserting that acorns are "poisonous," others as stoutly denying the assertion. The answer is easy enough. Anything is a poison which, if swallowed (or inhaled, or even injected), produces death; and in the strict acceptation of the term a man is poisoned who is killed by swallowing a penknife or a dose of ground glass. But the term "poison" is, as a rule, restricted to those things which are poisons in very small quantities. Children have often been poisoned by an over-dose of common salt given as an anthelmintic, and men have been poisoned by drinking for a wager a bottle of raw brandy, by eating for a wager ten pounds of beefsteak, and even by drinking cold well-water in hot weather. But yet we do not as a rule apply the term "poison" to salt or to brandy, or to beefsteaks or to well-water. The whole difficulty is one of ambiguity, and shows how a quarrel may arise from a mere misconception as to the exact meaning of a technical term."

Madeira.—The war, in the exercise of its remote influences, is giving at the present time a twofold prominence to the Island of Madeira. Coincidently with the neglect of the vineyards in France and Germany, an overflowing vintage has been gathered in. A large increase of produce was naturally expected from the progress of an extending vine culture; but a circumstance apparently trivial, a general paucity of seeds in the grape, was unforeseen, and has caused the yield to overflow the provisions of the most liberal calculations. There is a scarcity of casks to store the new wines, the few coopers on the island not being able to meet the demand on their labour. The absence of seeds, however, is stated by Dr. Graham, a Madeira authority, to be a constant result of a moist winter and spring. As a health resort, also, Madeira now obtains unwonted prominence by the defection of the popular winter retreats of the South of France. Notwithstanding the suggestions of circuitous routes to avoid disturbed districts, many persons prefer facing a sea voyage to the doubtful society of an excited and revolutionary population.—*Times.*

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 12, 1870.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed "Pharm. Journ."*

AID TO PHARMACEUTICAL EDUCATION IN THE PROVINCES.

WE have now before us the complete Report* of the Committee appointed to inquire into the facilities existing for provincial education in pharmacy, and this subject, one of the greatest importance to the future progress of our calling, is treated in a way which indicates that the future and the permanent have been steadily kept in view in their treatment of a difficulty which is transitional and only of the present.

The whole question hangs upon two points, the extent and kind of education which, for the public good, it is the duty of the Board of Examiners to demand from the students, and the remuneration which the pharmacists are enabled to reap as a consequence of their extended education. Another generation will see the present difficulties pass away under the action of the natural law of supply and demand, and the wisdom of those who hold the helm of our affairs will be seen in their endeavour to permit events to pass on as nearly as possible in their natural course, giving their attention to the assistance of those who do the best they can for themselves, and diminishing, wherever practicable, the sacrifices which individuals have to make for the general good.

With the experience before us of so many small societies which have sprung up and died of apathy in the second or third year of their existence, it would be imprudence on the part of the central body to give freely without some guarantee that the money was invested and not thrown away. It would likewise be a waste of strength to keep schools in operation which are not capable of providing their students with instruction in all the subjects required by the Board of Examiners. A student ought not to feel, on entering a school of pharmacy, that he would have to pass on to another for instruction in some subject in which the curriculum of the first school was deficient.

But in looking over the tabulated returns, p. 330, how few of the local organizations give us any assurance of either permanency or efficiency! Of the 27 enumerated, only 14 give lectures at all, and only 3—Edinburgh, Newcastle and Sheffield—give the complete curriculum. In Liverpool 26 lectures are made to include botany, materia medica and pharmacy. In Manchester practical chemistry and pharmacy are wanting. In Leeds materia medica, pharmacy and botany are wanting. In Leicester botany is treated in three lectures. To deny assistance to these latter towns, because their curriculum is not complete, would be blighting to our most hopeful prospects. Of the sixteen organizations which give the date of their establishment, ten were established in 1868 or 1869, and are only now at that period which is usually most trying to the vitality of institutions depending for their existence upon the labour of a few individuals who reap neither riches nor honour in return. A little judiciously-bestowed assistance will probably convert several of these into permanent and efficient institutions.

Many other modes of giving to the provinces have been suggested besides those recommended by the Committee; but any mode which did not involve a special inquiry into each case would save present trouble at the expense of the future. The arrangements now recommended are framed with the view to their naturally dying out; as the change in circumstances, which ten years will bring about, enables the teachers in the provinces to have sufficiently large classes and sufficiently high fees to remunerate them for their services.

As yet we can scarcely be said to have any data upon which to form an estimate, either of the number of students who will desire to avail themselves of official aid, or of the fees which may be expected from them. Allusion is made to the requirements of medical students having resulted in the establishment of medical schools in eight of the principal towns of England; but it must be remembered that the medical is more numerous than the pharmaceutical body, and that the medical student cannot take up his degrees without having attended lectures at recognized schools; whereas our students, so long as they have the required knowledge, may pick it up where and how they can. The attendance of students upon lectures when not compulsory will be determined by the fees charged and the value of the aid derived from them. The experience at Edinburgh and Newcastle shows that, even at the present time, something like remunerative fees may be obtained where the quality of the curriculum is satisfactory.

After making all due allowance for the difficulty of obtaining either large classes or large fees where the attendance is optional, we think the Committee have underrated what may be reasonably expected from provincial institutions; they say "the requirements of the Minor Examination may be met by a large section of young men who will take situations in towns offering the means of technical education." But there is no reason why provincial education in pharmacy should not shortly

* See page 389.

become as efficient as is the medical education provided in the eight towns alluded to in the report.

The value and permanence of local schools must depend mainly upon their enabling students in their neighbourhood to qualify themselves fully without the necessity of their attending lectures or laboratory practice in the Metropolis; and, while we would urge upon every student to avail himself of every means of gaining knowledge within his reach, we must admit that a mutual improvement society, with a small library and materia medica collection, should afford all the assistance required *by any earnest student* to enable him to pass the Minor. So long as there is a Minor Examination conferring the title of "Chemist and Druggist," and enabling the holder of the same to carry on business, the mutual improvement associations of small towns will do the work of providing the lower grade pharmacists for those neighbourhoods which do not afford scope and remuneration enough to tempt men of higher status.

The great preponderance of lectures on chemistry, a popular science, compared to those upon materia medica and pharmacy, subjects especially pharmaceutical, suggests that local associations have already availed themselves of science classes at mechanics' institutes, etc. In aiding such schools it will be necessary to see that contributions, either to a library or museum, for the benefit of pharmacy students, be not appropriated as the property of the mechanics' institution.

Clause 4 provides that the Council may impose conditions upon the recipients of their gifts, and clauses 9 and 10 indicate that a watchful eye will be kept upon the uses made of their contributions.

We shall look forward with interest every year to the tabulated return which they promise.

It now remains for our provincial friends to take stock of their own resources; to ask what they have done and what they can do for themselves,—what prospect they have of establishing permanent schools of pharmacy with such assistance as it would be reasonable on their part to ask, and on the part of the parent body to give; and, in the event of their expectations being of a less ambitious nature, to consider what help will meet the temporary wants of their neighbourhood, or will facilitate the working of mutual improvement classes, which, it must be remembered, was the only kind of school for pharmaceutical education which afforded assistance to many distinguished pharmacists of the present day.

We learn from a letter just received from Baron Liebig that he is scarcely yet recovered from his late severe illness, which was brought on by overexertion in working at the papers on "Fermentation," "Source of Muscular Power" and "Nutrition," of which translations were recently published in this Journal.

Our readers will notice with regret that at the last meeting Mr. H. B. Brady resigned his seat at the Council. Few besides those who have laboured with him have any conception of the energy and conscientiousness with which he performed *more* than his share of the Society's business, and of the impetus he gave to the moving power at a time when there were many Councillors and but few active *workers*. It is fitting that it should *now* be recorded in these columns that to him the Members and Associates are mainly indebted for the publication of this Journal *weekly*. Zeal for the Society and for pharmacy prompts us to hope that after the lapse of a few years, when he shall have grown proof against London fogs and English winters, Mr. Brady will allow his late constituents to again draw upon his time and comfort. We promise beforehand, on their behalf, that it shall *then* be for only a very *moderate* amount.

We understand that Messrs. Jenkins and Phillips, of Lime Street, E.C., have just received a large parcel of cinchona bark from Columbo, Ceylon. It consists of the bark of the twigs and young branches, and is in very fine condition. It is to be sold in Mincing Lane in about three weeks' time.

Our readers will regret to hear that Mr. Richard Reynolds, who has lately taken an active part in the preparation of the Report on Provincial Education, published this week, has met with an accident in a railway collision, and though we understand the result is not believed to be serious, it will require his being kept quiet for some time.

NOTICE.—In order to prevent delay in the insertion of advertisements, we find it necessary to remind advertisers that they should send to the Publishers, Messrs. Churchill and Sons, 11, New Burlington Street, and not to either the Editor of the Journal or the Secretary of the Society.

Proceedings of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

November 2nd, 1870.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.
MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Atherton, Bottle, Bourdas, Deane, Dymond, Edwards, Groves, Hanbury, Hills, Reynolds, Savage, Stoddart, Sutton and Woolley.

The minutes of the last meeting were read and confirmed.

The President read the following letter from Mr. H. B. Brady:—

"*To* G. W. Sandford, Esq., *President of the Pharmaceutical Society.*

"Dear Sir,—The time has come when it seems right for me to tender my resignation as a member of the Council of the Pharmaceutical Society, and I beg you to convey to the November meeting of the body my decision not longer to hold a seat at their board.

"I need not go into the reasons that impel me to resign now rather than retain office till the end of the year, but may just say that I have held office as long as in my opinion a member representing a country district should; that with the present preponderance of country members of the Council, I could not, during the winter months, do the amount of Committee work which it is absolutely necessary each should take, and that it would be wrong for me longer to hold a position which can readily be filled by some one with larger opportunities and greater power of benefiting the Society in these particulars.

"I need not assure the Council of my desire, whether in office or out of it, to further by every means in my power the advancement of pharmacy and the welfare of the Society.

"I remain, dear Sir, faithfully yours,
"Henry B. Brady."

Whereupon it was

Moved by Mr. Deane, seconded by Mr. Hills, and

Resolved—That the Council, in accepting the resignation of Mr. H. B. Brady, desire to record their great regret at the loss they sustain, and that circumstances necessitate the course he has found it desirable to adopt.

It was ordered to be recorded on the minutes,

That the portrait of the President, George Webb Sandford, painted by J. P. Knight, R.A., was presented to the Society at the first Evening Meeting for the session, October 5th, by Frederick Barron, Esq., in the name of the Committee of the Fund raised for that purpose.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . . . £1390. 5*s*. 3*d*.
Submitting for payments Accounts amounting to . . . . £582. 15*s*. 7*d*.
On the Benevolent Fund Account a balance of . . . . £547. 12*s*. 11*d*.

Resolved—That the Report be received and adopted and payments made.

The Report of the Library, Museum and Laboratory Committee having been read, it was

Resolved—That it be received and adopted.

Benevolent Fund.

Resolved—That Charles Thomas Anderson and Hannah Greaves, having at the late election obtained the largest number of votes, be declared elected annuitants, and that the Treasurer be requested to pay them their several annuities to Christmas next.

Application for temporary assistance having been made by the two unsuccessful candidates, it was

Resolved—That the sum of £10 be granted to each of them.

Resolved—That the Report of the House Committee be received and adopted.

Upon the Report of the Parliamentary Committee, it was

Resolved—That the Registrar be requested, and is hereby authorized, to erase from the Register of Chemists and Druggists the names of Thomas Holmes, of Great Grimsby, and Samuel Dicey Holmes, of Mortlake Road, Richmond, Surrey.

The following Report of the Provincial Education Committee having been read was received and adopted.

Report.

Your Committee have already presented to the Council tabulated results of their inquiries into the present facilities for Pharmaceutical Education in the provinces. These returns show the existence of a considerable amount of educational effort, which may be taken as confirmatory evidence of an educational demand.

The Committee next proceeded to the second stage of the inquiry remitted to them. They gladly embraced the opportunity of inviting Mr. Geo. F. Schacht, of Clifton, to attend their meeting, at which it was considered how to aid Provincial Education. The Report now presented shows the conclusions at which, after full discussion, the Committee arrived.

It is clear that the requirements of the Pharmacy Act of 1868 will annually compel the technical education of a number of young men, many times greater than can be received into the Society's School of Pharmacy in London. Many of these may obtain the needful amount of knowledge by diligent private study, but the case of the majority will probably be analogous to that of provincial students of medicine, whose wants have resulted in the establishment of medical schools in eight of the principal towns of England. To a large extent the students of these medical schools pursue their studies simultaneously with engagements as assistants to medical men. It is evident that the cost of an educational course is thus much reduced. Your Committee believe that whilst the greatest advantages will fall to the lot of those students who pass a session at the Society's School in London, still, the requirements of the Minor Examination (viewed as the portal to the title of Chemist and Druggist) may be met by a large section of young men who will take situations in towns offering the means of technical education.

Such a system, when established, will bring its attendant changes to both employer and employed. The former must be prepared to grant a regular amount of time to his assistants for attendance upon lectures, and the assistant will doubtless find that the money-payment for his services is somewhat reduced in consequence.

The Committee consider that there are many reasons tending to make this system of education a desirable one. The following are the more prominent, viz.:—the interests of the students, to whom a complete course of instruction would be offered, to the discouragement of spasmodic effort and cramming; the advantages of a healthy competition and the stimulus of class-teaching would be secured; the standard of the Board of Examiners would be upheld by the circumstance that the required education could be obtained by those who wished for it; finally, the above-named influences would raise the tone of the body corporate, and increase its *esprit de corps*.

It does not appear to be the function of the Society to initiate new Schools of Pharmacy, but it may materially strengthen the endeavours which are being made in this direction in various districts, and aid the further development of existing institutions. Theoretically, the Society ought to require as a condition of granting aid that there should be a complete curriculum of the subjects required for the Minor Examination, viz. Chemistry, Practical Chemistry, Materia Medica with Pharmacy, and Botany. The Committee recommend that this standard be deemed to be that recognized by the Council, but that at first its application be not enforced.

It frequently happens that courses of lectures delivered at other institutions are available for the students of provincial Chemists' Associations. Where no reason to the contrary exists, this economy of teaching-power is to be commended and encouraged.

The discussion upon Provincial Education at the recent meeting of the British Pharmaceutical Conference at Liverpool exhibited great unanimity of feeling upon the elementary education to be required from those entering the calling of pharmacy. The opinion was expressed by nearly all the speakers, that no youth should be accepted as an apprentice until he had passed the Preliminary Examination. The Committee cordially endorse this view, and they would exclude the subjects of this examination from those to be aided by the Society.

The question of *permanence* in the system of grants in aid of Provincial Education has received attention, and the Committee wish to record their views upon this important aspect of the question. They regard the present as a period of transition, since a large number of young men are now engaged in pharmacy who entered upon it prior to the passing of the Pharmacy Act of 1868, and who find that qualifications which they did not anticipate are demanded from them. These young men represent the class which will probably be the earliest to reap the full benefits of the Pharmacy Act, but it must be admitted that they do not find those educational institutions which should be complementary to the examinations they must undergo. For a period of five or six years this class will continue to exist, but in a diminishing ratio. The history of the School of Pharmacy in Bloomsbury Square affords a precedent, since private enterprise could not sustain the earlier years of an establishment so favourably situated as that was. The fact that education was a voluntary act justified the support given by the Society to the School of Pharmacy. The position of the class of young men now referred to justifies the extension of aid to educational courses in the provinces. When this transition period shall have passed, the *raison d'être* of the present scheme will have passed with it, and the experience of its working will certainly leave some valuable lessons. The Committee do not consider that it will permanently be the duty of the Society to contribute funds for educational purposes in the provinces, and they would urge upon all who undertake the management of local education to bear in mind that in a few years it should be self-supporting. Even now, thoroughness ought to be ensured in any course offered to students, and such fees should be fixed as are compatible with this.

The Committee recommend that for the present the following be laid down as conditions for making grants in aid of Provincial Schools of Pharmacy, viz.:—

1. That the application be made in writing by three or more resident members of the Pharmaceutical Society.
2. That it shall state the kind of aid required, and, where a money grant is applied for, shall indicate the sum intended to be applied to each specific purpose.
3. That where a grant is made for the purpose of providing materials for class-teaching, the applicants shall be prepared to guarantee their safe custody for a period of three years. The said materials to be the loaned property of the Pharmaceutical Society for three years, at the expiration of which they may be resumed by it, or otherwise disposed of. The Council may, in special cases, forego this guarantee where it deems it not desirable.
4. Such duplicate specimens as may from time to time be available from the Society's Museum shall be distributed amongst the Museums of Societies making application in accordance with Clause 1, and shall be regarded as absolute gifts unless the Council shall impose conditions.
5. Applications for aid to libraries must give particulars of the number of volumes already contained in such library, and specify the name of each book applied for and its price.
6. That where a grant is applied for towards guaranteeing a minimum sum to a teacher of chemistry, practical chemistry, materia medica, pharmacy, or botany, a statement shall be made of the number of lectures to be given, the lecture hours, and the fees to be paid by the students. If such grant be made, the names and attendance of the students at each lecture must be recorded, and reported to the Council at the end of the course.
7. The Council may grant sums to pay to provincial schools one-half of the salary of a student or other person as curator and lecture assistant.
8. The relative claim of any town to receive aid from the Society must be indicated by the earnestness and efficiency of local effort. A complete curriculum of chemistry, practical chemistry, materia medica, pharmacy and botany, is the standard to be aimed at.
9. All applications to the Council for aid may be referred to a standing Committee appointed annually for this purpose. The recommendations of the Committee to be laid before the Council for action thereon.
10. The Committee to present annually a tabulated return of the state of Provincial Education.

Resolved—That the Committee on Pharmaceutical Education be continued as a standing Committee.

Resolved—That a grant of not less than eight guineas be made to applicants from Norwich for the purchase of sets of Botanical Diagrams, subject to the conditions already adopted by the Council.

REPORTS OF EXAMINERS.

October, 1870.

England and Wales.

	Candidates Examined.	Passed.	Failed.
October 14, Modified	45	30	15
„ 19, Major	4	4	0
„ „ Minor	24	19	5
„ 20, „	18	13	5
„ 3, Preliminary	224	164	60
„ „ Certificates in lieu of Preliminary Examination	9	0	0
	324	230	85

Scotland.

	Examined.	Passed.	Failed.
October 11, Major	2	2	0
„ „ Minor	6	4	2
„ „ Modified	9	7	2
„ „ Preliminary	5	4	1
	22	17	5

Resolved—That diplomas stamped with the Seal of the Society be severally granted to the following Pharmaceutical Chemists:—

Barrett, Frederick John ...... Fakenham.
Butterworth, Albert .... Sowerby Bridge.
Joule, John Samuel .... Buxton.
Strickland, George Hodgson .. Yarm.

Resolved—That the following, having passed their respective Examinations, be elected

ASSOCIATES OF THE SOCIETY.

Minor.

Bradford, Cordley .... Spalding.
Eden, Thomas .... Dublin.
Elliott, Thomas .... Clay Cross.
Foster, Henry P. .... Portsmouth.
Francis, Geo. B. .... Diss.
Goodman, Daniel H. ...... Bath.
Grinstead, John .... Chichester.
Little, Arthur N. .... Bristol.
Loveless, Edward Wm. .... Bath.
Marshall, Austen .... Stratford-on-Avon.
Melhuish, Thomas B. ...... London.
Part, Edward James ...... Dover.
Robinson, Joseph .... Chester-le-Street.
Salmon, Thomas .... Pontypool.
Thomas, John D. D. ...... Clifton.
Walker, John S. .... Manchester.

Modified.

Cullen, Robert Henry ...... Paris.
Dunn, Henry .... Shipley.
Evans, John .... Worcester.
Farrer, Robert S. .... Brighton.
Fewster, William L. ...... Liverpool.
Forster, William Day ...... Godalming.

Gregory, John .... Stockton-on-Tees.
Harland, Richard T. ...... York.
Hughes, William, jun....... Presteigne.
Lloyd, John .... London.
Oakey, Joseph .... Liverpool.
Sproat, Robert .... Hull.
Wilson, Joseph G. .... Dublin.

Resolved—That the following, having passed the Modified Examination, be elected

ASSOCIATES IN BUSINESS.

Casely, Samuel .... London.
Hollway, Albert B. .... Cardiff.

Resolved—That the following, having paid their Arrears of Subscription, and the usual fines, be restored to Membership:—

Thonger, Gilbert .... Birmingham.
Potter, Charles .... Knaresborough.
Horsfield, John M. .... Rotherham.
Hallsworth, Thomas .... Ardwick.

Resolved—That Charles Potter (Associate, 1842) be and is hereby elected a Member of the Society.

Resolved—That the following Registered Chemists and Druggists be elected

MEMBERS OF THE SOCIETY.

Henry Overbury .... Alcester.
Sidney Redman .... Taunton.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The First General Meeting of the Twenty-second Session was held at the Royal Institution, Colquitt Street, on the 27th October last; the President in the chair.

The Secretary announced that the following gentlemen had been elected officers for the Session 1870–71:—*President:* Mr. John Abraham; *Vice-President:* Mr. Edward Davies, F.C.S.; *Honorary Treasurer:* Mr. John Shaw; *Honorary Secretary:* Mr. Alfred H. Mason, 56, Hanover Street; *Council:* Messrs. Barber, Delf, Jones, Murphy, Redford, Sharp, Summer, Symes.

Professor Attfield, Ph.D., F.C.S., Thomas Hyde Hills, Esq., London, W. W. Stoddart, Esq., F.C.S., F.G.S., Bristol, were unanimously elected honorary members of the Association.

Mr. J. M. Buck was elected a member, Mr. Burnet D. Cohen was elected an associate.

Several donations to the Library and Museum were announced.

Mr. Davies, F.C.S., exhibited a specimen of phosphorus, crystallized from fusion, in crystals of peculiar form, and explained its formation.

Miscellaneous communications having been discussed, the President, Mr. John Abraham, delivered the opening Address of the Session as follows:—

"It has been usual to commence the business of the Session by a few introductory remarks from the chair, and, in accordance with this custom, I proceed to make a few general observations. Two valuable addresses have lately been delivered, which many of us have heard or read. One by Mr. Stoddart, at the recent meeting in Liverpool of the Pharmaceutical Conference; the other, by Mr. Schacht, at the opening of the Session of the School of Pharmacy in Bloomsbury Square. The former was delivered in this place, and conveyed some compliments, which, I suppose, we might appropriate to ourselves, did our self-appreciation accord with the generous sentiments of the speaker. Our pursuits demand scientific knowledge, and they afford some opportunities for scientific research; but it cannot be said that many of us devote much time to experiment or to study. Some—perhaps most—are too busy, some are so little busy in those things which keep the pot boiling that they think they can spare no time for any pursuits which do not bring fuel to the fire. It is not for me to do more than remind such of the pleasures and advantages of science; and if any one says or thinks that it is not for me to teach or censure others, I am sure that he will meet with a cordial assent from myself, only that I respectfully plead the necessities and duties of my office. Teachers, and even parents, inculcate many a valuable lesson which they do not always exemplify. Allow me to quote a few words from Mr. Stoddart, which I believe to be well worthy of repetition. 'The pharmaceutist must make the most he can of the numerous animal, vegetable and mineral substances with which he has to do, and to carry on his operations with the view of producing the best results. I am convinced that the most prosperous and happy of our body are those that bear these things in mind and who look upon mental cultivation as a delight, and not as a necessary but disagreeable task.'

"Our Society is not so meritorious as some of our friends have been pleased to think; it is not so useless as perhaps some of ourselves occasionally fear. We keep a little flame of science burning. We afford opportunities for useful discussions, and I confidently affirm that during the whole period of the existence of the Association, we have afforded full opportunities at the smallest possible cost for the acquisition of a scientific knowledge of their profession by students of pharmacy. If the number who have availed themselves of these privileges has been small, it has been from no fault of the Association or of its teachers. An honourable ambition to be useful, not hope of fees, has been the stimulus to those who have given their time and talents to this work. If any of our friends think we ought to do more, and well they may think it,—I say *let them help*, and if they do not, whatever the reason may be, I venture to think they should not discourage those who may try to do a little. The other address to which I have referred is that of Mr. Schacht on the opening of the session at Bloomsbury Square. Those who had not the pleasure of hearing it will be rewarded by a reference to the Pharmaceutical Journal and *Chemist and Druggist*, and I would strongly recommend every young man to read it. Mr. Schacht has taken great interest in the cause of pharmaceutical education, and he thinks that the Pharmaceutical Society should do more than hitherto to promote education in the provinces. I wait to know how he and others propose to effect their object. I fear that more is expected from the Pharmaceutical Society than the few thousands a year at the disposal of the Council can possibly accomplish. It occurs to me that possibly the Society might be instrumental in procuring the occasional services of lecturers and experimental demonstrators in places where no competent instructor resides, but where a tolerable class would bear the whole or part of the expense. The theory has hitherto been that an apprentice was taught his business by his master, and if he were not perfect by the end of his apprenticeship that he could pick up all he wanted behind some other counter. Modern ideas of the duties of the pharmacist do not accord with these. A scientific knowledge of chemistry and of botany is insisted on and required by Act of Parliament. This can hardly be acquired behind the counter, even if every master were qualified to impart it. We know that this is not the case, and that apprentices who learn nothing except what is acquired in the ordinary routine of a shop are exceedingly deficient in these necessary things.

"Of the new drugs which have been recently introduced, chloral is the most important. So far as I can learn, we are entirely indebted to the Continent for our supply, and it is by no means of a uniform character. I cannot see why it cannot be made in Lancashire as well as anywhere else, unless it be that our excise duties on spirit interfere. Surely bonded laboratories would be conceded by the Government, and I have heard that the manufacture of tinctures in bond for exportation has been commenced. The price of opium and its preparations continues very high, but it is, perhaps, still more important to note that the quality of opium brought into the market is even more variable than formerly. Mr. Morson informs me that opium supposed to come from Persia, and very similar in odour and appearance, varies in its richness in morphia from 1 to 10 per cent. Some promising specimens from a new source—Australia—were shown at our recent exhibition. The adulteration of drugs has been curiously illustrated lately in respect to two imported articles, saffron and cochineal, in both of which the weight of the genuine article is largely increased by powders made to adhere to them. For the detection of the former we are indebted to Mr. Daniel Hanbury, who has shown that carbonate of lime is made to adhere to the saffron, with hardly any change of appearance, though chemical tests and also the microscope make it apparent. In the case of cochineal, a shining powder is made to adhere to the insects, as I can easily show you. The powder is not soluble in hydrochloric acid, and it may be micaceous or barytic.

"It will have been seen that the Council of the Pharmaceutical Society have again under their consideration the provisions for the regulation of the keeping and dispensing of poisons. This office is conferred upon the Society by Act of Parliament, and every consideration of prudence and duty compels the Society, in my opinion, to attempt its discharge. It may be that some mode of effecting the object may be devised less obnoxious than that hitherto proposed, but I think that the opposition which the formerly framed regulations met with was a mistake. I should, however, be quite willing that they should at first be tried as a voluntary system only.

"In conclusion, I beg to express my hope that we may have a prosperous session; that each one will contribute his quota to the common stock, and that amongst them will be some who have not hitherto read papers to us."

After the address the President illustrated his remarks about the adulteration of saffron and cochineal, etc., and a discussion followed.

A very cordial vote of thanks was moved by Mr. Davies, F.C.S., to the President for his hopeful and practical address, and seconded by Mr. Redford, who expressed a hope that the President would impress upon principals the necessity of allowing their apprentices and assistants time to avail themselves of the opportunities for study offered for them to enable them to meet the requirements of the times.

The President having briefly returned thanks, the meeting separated.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

The Inaugural Meeting of this Society was held in the new rooms, in Duke Street, on Friday evening, October 21st. The employers having been invited to attend, the majority of the leading members of the trade were present, including Messrs. F. Sutton (Local Secretary to the Pharmaceutical Society), A. J. Caley, O. Corder, J. Robinson, J. R. Fitch, Cubitt, W. Searby, Gardiner, Cassey, F. Smith, W. S. Bird and Wilson.

Letters were read from other gentlemen, expressing their inability to attend and their hearty co-operation with the movement.

The room was adorned with some handsome rare ferns in pots, and other botanical productions; also magnificent specimens of the crystals of the Pharmacopœia, and a beautiful collection of the many alkaloids of the chinchona barks.

The President (Mr. Alfred Hill) took the chair at 8.30, and said:—

Gentlemen,—My first duty this evening is to offer thanks, in the name of this Association, to those of our employers who have shown their willingness to help by their presence here to-night. Such a public expression of sympathy was the one thing wanting to strengthen our hands; all else has been most encouraging; those gentlemen before whom any notice of our projects has been laid up to the present, have expressed their entire concurrence with them. The limited time at our disposal has, however, prevented our consulting with many principals; I beg, therefore, to lay before you, in as few words as possible, the objects of this Association, together with the means of fulfilling the same. It will not be necessary for me to advocate the utility of this project,—no one can now open a business without first passing the Examinations of the Pharmaceutical Society,—our object is, by mutual help, to render easier the preparation for these examinations. In the first place we desire to found a library. For some time to come we shall be unable to purchase, so we have inaugurated a loan system, and, as far as we have gone, this seems to be very promising. For the first fruits I beg to refer you to these shelves; the majority of these books have been lent by the members of the Council. Those principals, to whom we have at present applied for co-operation in this work, have nobly responded, and I do not doubt that other gentlemen will do the same. These books will not be allowed to circulate. In time, I hope to see the walls of this room covered by objects of Pharmaceutical interest and folios of autograph prescriptions upon the table. In both of these aims, I solicit our employers' help, as we must principally depend upon them for the nucleus of our museum.

For the use of the Chemistry Classes, Mr. Robinson has most handsomely presented a varied collection of chemicals, etc., and I now beg to thank him in the name of the Association. I regret that I am unable just at this moment to lay before you precise arrangements respecting the classes,—the first of which, however, will be held on Monday evening next, at 8.15, subject, "Elementary Chemistry," by Mr. E. Nuthall, and we hope by that time to have a list of all for your information.

The classes proposed by the Council are, Chemistry, Qualitative Analysis, Botany, Materia Medica and Latin.

I cannot refrain from noticing the kindness with which Mr. A. J. Caley and Mr. O. Corder have offered to give lectures, respectively, on Materia Medica.

On Monday, this room will be at your disposal for reading, etc., and I would recommend all those who purpose going through a regular course of study to come up then and register themselves for their respective classes.

Besides the annual income, a large outlay is required at the start for furnishing. To this fund I hope the employers will subscribe liberally. We have been compelled to lay on gas, and are desirous of doing the same with water. The last, however, we fear we must omit for the present.

With the exception of addressing a few words to those who will shortly be students, I feel my task to be ended. To them I would say that however complete the administration of this Association, its ultimate success rests with you. Unless you work with a heart and show your appreciation of the many advantages by getting rapidly through the examinations, this Association will be a mere skeleton without life. But if, on the other hand, you attend the classes regularly, supplementing this by home work, I feel sure that this Association will prove a glorious success.

Upon the means of securing regular attendance at classes, I would earnestly invite discussion. There seems to be a strong feeling in favour of some method of making attendance at classes other than a matter of fancy, so that the tutor may be saved the annoyance of the constant repetition necessitated by occasional students.

I would recommend to your consideration the system of entrance fees for each class, reminding you that that which one has to pay for one values more than anything gratuitous and is less likely to throw away; of course, these fees would go to the funds of the Association, not to the tutors. I would suggest that a portion of the money be devoted to the purchase of a prize or prizes for competition by the students. I trust to hear a full expression of feeling on this subject from all present.

From what I have said, I hope you will not infer that I look upon the passing of the examinations of the Pharmaceutical Society as the only ultimate object of these efforts. I wish you to understand that I deprecate "cramming." The simple acquirement of facts can be of little use except for the present. But if these facts are employed to develope reasoning powers so as to enable you to trace in them the working of those laws which we call nature, they will elevate you into thinking men, and make you ornaments to the calling upon which you have entered.

Mr. F. SUTTON, F.C.S., who had, at the request of the Committee, called upon the employers to be present, wished, as Local Secretary of the Pharmaceutical Society, to be permitted at that stage of the meeting to say a few words of congratulation and encouragement to those young men. He had that day received a letter from an employer, regretting that he could not be present, and stating that a similar association was formed twenty-five years ago, but fell through, owing to the lukewarmness of the young men themselves. He could quite believe that was the case, but circumstances had strangely altered since then; and now it was not a matter of choice with a young man whether he passed an examination or not, it was a matter of necessity, and it behoved every one present to look that fact fully in the face. He would caution them not to expect too great things at first, not to attempt too much. A very great deal might be done with limited means; it was astonishing how many instructive demonstrations, in practical chemistry for instance, might be shown with the simplest apparatus. He was very glad to hear that a course of lectures on pharmacy and materia medica had been promised by Mr. A. J. Caley, and another on botany by Mr. Corder. For his own part, he regretted that he could not promise a course of lectures on chemistry, but he would give them a lecture or two, and felt sure there were some among themselves whose practical acquaintance with the science was sufficient to give all the demonstrations required. Norwich laboured under the great drawback that there was no school of medicine or science in it, nor any private teachers, and he feared it would be a long time before the city could establish such public aids as were to be found in many large manufacturing towns in the North and West. He was glad to see so many of the employers present, but was prepared to see all. This was a movement which was of quite as much importance to them as to the young men; he felt sure that the better educated and more intelligent an assistant or apprentice was, so much the more would he be of service to his employer.

Mr. A. J. CALEY assured the meeting of his support, and enforced the necessity of real work. He spoke of the pleasures to be derived from the possession of knowledge, and the immense advantages of early rising, tendering much kind advice to the young men.

Most of the other employers present took part in a discussion upon the hours most suitable for having the rooms open, Messrs. SEARBY, GARDINER and WILSON advocating the necessity of closing the rooms at an early hour, to allow the apprentices to reach their homes without interference with domestic arrangements.

Mr. SMITH remarked that an evident consequence of this Association would be the adoption of an early hour for closing their respective establishments, to allow their assistants the full advantage of the Association.

Questions from Messrs. BIRD and CUBITT elicited various particulars relating to expenditure, etc., from the Treasurer and Vice-President in the unavoidable absence of the Secretary.

All the employers present joined as honorary members, and the following donations were promised:—

	£.	s.	d.
Mr. Caley	1	1	0
„ Sutton	1	0	0
„ Smith and Sons	2	2	0
„ Cubitt	1	1	0
„ Row	1	1	0
„ R. Fitch	1	1	0
„ J. R. Fitch	1	1	0
„ J. Robinson	1	1	0
„ G. P. Watson	1	1	0
„ English	1	1	0
„ R. C. Pitts	2	2	0
„ J. Watson	1	1	0
„ William Rackham	1	1	0

Mr. O. Corder a set of botanical diagrams.

A vote of thanks to the Chairman terminated the proceedings.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The First General Meeting of the Session 1870–71 was held in the Rooms of the Society, Britannia Chambers, on Friday Evening, October 21st; the President, Mr. J. H. Atherton, F.C.S., in the chair. The following Donations to the Society were announced:—Three Guineas, from Mr. Bass; the 'Pharmaceutical Journal,' from the Pharmaceutical Society; several books, from Mr. W. H. Parker; the first volume of Gmelin's 'Chemistry,' from Mr. Rayner. The thanks of the Society were heartily accorded to the donors.

Mr. Burnie's Report of the Botany Class was read by the President, and the Prize for the greatest efficiency was awarded to Mr. Bothamley.

A number of interesting objects were upon the table, the uses of which were explained by the President; amongst others,—an interesting collection of Ashes of Plants, and other substances, illustrating the more general diffusion of some of the rarer elementary bodies (including the new metals Rubidium and Indium), which was exhibited at the Meeting of the British Pharmaceutical Conference at Liverpool, illustrative of the recent researches by Mr. Stoddart, the President, in the application of spectrum analysis to medicinal substances; Limousin's Oxygen Apparatus, for preparing and inhaling oxygen gas; a new Drop Bottle; and Maw's Nautilus Life Belt.

The PRESIDENT then delivered the Inaugural Address of the Session, in which he reviewed the past work of the Society, and spoke of its future, particular attention being given to the provincial education question; the present means of technical education in London and the provinces, and the best method of supplying the demand, caused by the educational improvement necessitated by the operations of the Pharmacy Act; and the urgent necessity that assistance should be rendered to societies showing a disposition to help themselves, which, by local peculiarities, were debarred from the assistance of any existing technical schools. Referring to the general aspect of the Poison Regulation question, the President expressed his opinion that, in face of the very few accidents attributable to the carelessness of dispensers, and the higher educational standard imposed, it was unwise to insist on any "compulsory" regulations whatever. But if the Pharmaceutical Council felt that, in their interests and the interests of the public, some extra precautions were necessary, he felt sure that the issue by the Council of suggestions, to be adopted by those not already using any suitable precautions, would be met and treated with respect and consideration. The President said he felt bound to allude to the present unsatisfactory condition of the 'Journal.' He believed, however, that it was of only a temporary nature, and that an improvement would soon be manifest. He then referred to the principle involved in the issue of such a periodical by a body like the Pharmaceutical Society, and hoped that in time the 'Journal' would be simply the record of the proceedings of the Society, and that the trade and miscellaneous matters demanded by the chemists throughout the country would be supplied by the issue of an independent weekly publication like the 'Lancet.'

After referring to other practical matters, the President concluded by urging the members and associates to unite together in endeavouring, by mutual concessions, to carry out the work of the Society, and the general advancement of pharmacy.

A cordial vote of thanks to Mr. Atherton for his interesting address was moved by Mr. Rayner, seconded by Mr. Fitzhugh, and carried unanimously.

The following programme of lectures and classes in connection with the School of Pharmacy of this Association has been arranged for the ensuing Session:—

Chemistry.—A course of thirty lectures, by Mr. George Elders, M.B., on "Inorganic Chemistry," to commence on Monday evening, November 7th, at the rooms of the Association, and be continued weekly. Time, 9 to 10 P.M. Fee for the course, 5*s*.

Pharmacy and Materia Medica.—A course of twenty-six lectures, by Mr. Mayfield, M.P.S., at the rooms of the Association, commencing on Wednesday evening, November 9th, at 9 o'clock.

These lectures have been arranged with special reference to the requirements of the Examinations of the Pharmaceutical Society. Fee for the course, 5*s*.

Botany.—Arrangements will be made for a course of lectures on "Structural and Physiological Botany," to commence in the Spring, full particulars of which will be announced in due course.

Preliminary Examinations.—Although not forming part of the ordinary technical education provided by the Society, the Council have arranged for a class, provided a sufficient number of associates make application to join. (No arrangement will be made for less than ten candidates.) Fee for a course of twelve lessons, 5*s*.

Until further notice, the Library and Reading Room will be open on Monday and Wednesday evenings, from 8.30 to 10.15 P.M.

Applications for information and tickets for the various courses of lectures should be made to the Honorary Secretary, Mr. J. T. Mayfield.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT LIVERPOOL.

Wednesday, September 14th.

(*Continued from page 376.*)

THE STORING OF POISONS.

BY EDWARD SMITH, F.C.S.

One of the most important and interesting questions at the present moment on the pharmaceutical *tapis* is "the storing of poisons."

From the tone of the medical and general press, it is very evident that the public consider the Pharmacy Act to have thrown the onus of suggesting and providing efficient means to prevent "as far as possible the lamentable calamities from accidental poisoning which so often shock the public mind," on the Pharmaceutical Society, *i. e.*, practically on ourselves; and therefore, whether we agree with, or differ from, the reasons which induce the public to require this at our hands, it is very clear that unless we set our house in order, and, to the best of our abilities, provide some plan of storing poisons more in accordance with the wishes, and with some regard for the tender susceptibilities, of physic-takers, we shall presently find ourselves in an exceedingly unfortunate position, by having the power to act taken from us and placed in the hands of those who will turn a very deaf ear to any appeal or entreaties on our part. We shall probably find ourselves smarting under the imposition of unpractical and very irritating regulations, and possibly compelled even to submit our pharmacies to the indignity of inquisitorial supervision by Government officials.

Without entering into the general question as to the desirability, necessity, or otherwise, of *any* poison regulations, it appears to me that at the somewhat peremptory demand of the public, either from within or without, must some action proceed; and surely there cannot be a shadow of a doubt in our minds as to who are the most competent to undertake the matter. Our business is one of such a varied character—a combination, as it were, of the elements of a profession, with trade as a basis—that we cannot contemplate the interference of an external authority without shuddering at the inevitable result.

If, then, we are best able to manage our business affairs and provide our own laws and rules, the soundest policy and the truest wisdom dictate that we should lose no time in facing and grappling with this poison question, which already ripples the sea of public opinion, and which may, if we are not wise enough to calm the rising storm, ultimately swamp all our hopes of self-government, and possibly convert the Pharmacy Act into an instrument of grievous oppression. For these reasons, I now venture to bring the subject before you, in the earnest hope that some satisfactory proposition may be evolved from the discussion which may follow, and that as the fruit of your deliberations, the Pharmaceutical Council will be enabled to frame regulations, equally satisfactory to ourselves and to the general public.

When we come to consider the matter attentively, we soon discover there are two essential conditions on which every regulation must be based, viz. simplicity and elasticity.

Any complex arrangements would speedily break down, and collapse by their own inherent weakness. The first strain put upon them would create a state of things very much more conducive to an accident than the entire absence of all regulations. Indeed it is highly improbable that they would or could be carried out by the majority of pharmacists, since it would entail an expenditure of time not often at the disposal of those engaged in business houses. Pharmacists are not, as a rule, in a position to retain the services of more assistants than they can fully employ; hence, during a press of business, either behind the dispensing counter or on a market-day, when perhaps scores of pounds of arsenic and other poisonous preparations are retailed over the counter, any but the very simplest regulation would, in point of fact, be ignored.

Whatever plan we decide upon must, of necessity, therefore be so simple that it will safely bear the many and varied exigencies of everyday practical work.

In addition to simplicity, there must also be elasticity; for not only have we to take charge of the few grains of atropia or aconitia, but also 7 lb. parcels of oxalic acid and the hundredweight cask of arsenic. The same regulation should, if possible, cover every case.

Now, on reflection, it is clear that in addition to the care habitual to those who have the handling of poisons, we can frame regulations based upon either one or both of the senses of sight and touch. The former we have embodied in the use of blue poison bottles; the latter in the various angular and peculiarly-shaped bottles that have from time to time been suggested.

Hitherto, these ideas have only been carried out with regard to bottles, and it is really difficult to see how peculiarly-shaped parcels or casks can practically be used. I conceive we are compelled to fall back upon the sense of sight, which perhaps is the most acute of all our faculties, and the best for our purpose, seeing that it is the one most intimately connected with the brain and intellect. For these and other reasons I would therefore suggest that all bottles, packages and casks containing poisons be of a dark blue colour. I fix upon blue simply because it has already to a certain extent been adopted by many pharmacists, and requires but very little extension to complete the system. From time immemorial Scheele's acid has been stored, with general satisfaction, in blue bottles, and possibly may have been the *fons et origo* of all blue poison-bottles.

There can be no difficulty in wrapping parcels of poisons in blue paper, nor in painting casks with blue paint. Shop bottles as well as stock bottles would of course follow the same rule, so that without any difficulty, and with a minimum of disturbance to existing arrangements, this simple plan might very readily be adopted. Of course every package must be distinctly labelled, and the word 'poison' attached.

I object to alternative regulations, because they create confusion, and, imperceptibly, lead to no distinct regulation whatever. Our assistants, who have mainly the handling of poisons, are not fixtures; they migrate from one place to another, and if at each pharmacy a different method of storing obtains,—the changes being rung, as it were, on alternative systems,—naturally enough the mind gradually loses its sensitiveness to the danger implied by these differing regulations, no distinct impression is retained capable of acting as a caution, and the inevitable result is confusion and insecurity, if not positive danger.

I see no great advantage in every pharmacist using the same shaped bottles; I would rather allow sufficient latitude in such minor considerations, so that a man may use his own discretion, and adapt his plan to suit the especial requirements of his pharmacy.

Neither do I agree with poison cupboards or other methods of isolation. They are, at best, but clumsy mechanical contrivances, and would, in all probability, fail to secure the smallest modicum of safety; but, on the contrary, rare and seldom-used, but inoffensive preparations would be stored there as a place of safety, and thus render supremely dangerous the very place where security is supposed to reign triumphant. There seems to me, practically, to be far greater safety in the distinctively-coloured poison bottles, dotted here and there on the shelves, than having them concentrated in some out-of-the-way and dismal corner of a cupboard or room; and not only because these individual dots appeal more distinctly to the mind through the eye, but also because we thus avoid the especial danger—a danger by no means to be disregarded—of using one poison for another. I conceive there is nearly as much danger in dispensing, say strychnine for morphia, as strychnine for James' powder; and, therefore, any plan of bringing powerful medicines together has in it an element of weakness which may easily eventuate in an accident.

It may be thought that simply to enclose all poisons in a blue or other plain-coloured receptacle is, in reality, no precaution at all; undoubtedly not, unless the adoption is general and complete. But the Pharmaceutical Society has the power to make it a general, and, therefore, efficient precaution. By the first clause of the Pharmacy Act, all pharmacists must conform to such regulations as to the keeping, etc., of poisons, as may be prescribed by the Pharmaceutical Society, with the consent of the Privy Council, and the twenty-sixth clause enacts that the name of any person who is convicted of any offence against the Act, may be erased from the register of pharmacists,—that is, deprived of the right of selling or keeping poisons; and this power, invested in the Society, is the fulcrum by which all of us may most effectually be compelled to carry out any simple regulation, such as the one proposed.

I have in this paper but very cursorily touched upon the more salient points of the question, my object being rather to provoke discussion than to dogmatize.

There is one consideration, however, which the Pharmaceutical Council must, in common justice to our profession, and out of regard to the public safety, not lose sight of. I refer to the expediency of *all* dispensers of medicine adopting the same system and conforming to the same regulation. Clearly enough it would be idle to enforce regulations upon us, if dispensing surgeons, who are said to dispense on an average more medicine, and, it has been said, poison more patients than pharmacists, should be still allowed unrestrictedly to keep and sell poisons. I do not mean that they should in any way become subject to the Pharmaceutical Council, but to their own governing body,—that is to the Council of the College of Physicians or Surgeons, who should have the power to reprimand or suspend, according to circumstances.

The probable effect of this would be that many surgeons would be induced to give up dispensing, much to their own ultimate advantage, whilst pharmacists being no longer deprived of their legitimate work, would gladly embrace the opportunity of giving up prescribing or encroaching in any way on the province of the medical man. I am sufficiently sanguine to believe that so very desirable a result will eventually be secured, having, as its ultimate effect, the creation of a feeling of perfect harmony and community of interests between the members of the medical and pharmaceutical profession.

Parliamentary and Law Proceedings.

Greenwich Police Court.

BEFORE MR. MAULE.

Mr. Hassett, grocer, appeared to answer to a summons charging him with an infringement of the Petroleum Act, by keeping petroleum oil in an iron drum or cistern and a can, without wire-gauze at the openings. The inspector said, that upon visiting Mr. Hassett's premises, he found in the yard an iron drum or cistern, containing benzoline oil. The opening or neck had had wire-gauze, but it had evidently been eaten away by the oil. Near the drum was a can containing four to six gallons of benzoline, which had no wire-gauze, as required by the Act.

For the defence, it was urged that the wire-gauze of the drum or cistern had been accidentally knocked off by a boy while emptying the benzoline from the cans, which were supplied by merchants without such wire-gauze.

Mr. Maule said that it was most important that the provisions of the Act of Parliament, in relation to the storing or keeping of petroleum oils, should be strictly adhered to, and imposed a fine of £2. 10*s*. and costs.—*Times*.

Charge of having substituted a Mercurial Powder for Dover's Powder.

This case was heard at the last Cavan Quarter Sessions, in Ireland. A sub-inspector of constabulary, at Ballyjamesduff, named Henry Weir, brought an action to recover £40 damages from a Dr. Barnes, for having carelessly administered improper medicines to the plaintiff. He stated that he had a cold and applied to Dr. Barnes for a Dover's powder. Two were sent, and he took one of them on a Saturday evening; that night he was very ill, "a dry heat through his skin, no perspiration, and his throat very sore." On Sunday Dr. Barnes called to see him and gave a gargle for his throat, and he took the remaining powder. These powders did not cause perspiration, but, on the contrary, salivated to an extraordinary degree. A Dr. Mawlimney was then called in and found his pulse very high, and, on examining his mouth, Dr. Barnes agreed with him that Mr. Weir was labouring under mercurial salivation. There was then some conflicting evidence as regards the presence of an ulcer in the plaintiff's throat, and the general condition of the said plaintiff. The Assistant-Barrister, before whom the case was tried, said that it was evident that by some mistake the plaintiff got the wrong medicine, and, under the circumstances, he would give a decree for whatever amount he had been out of pocket by the transaction, viz. £6, plaintiff's cost, and £10 Dr. Mawlimney.

One of the medical periodicals, in commenting upon the foregoing, says that there was no evidence to show that the patient's salivation was caused by mercury at all, and, that if it were so, there was no evidence to show that the powder supplied by Dr. Barnes contained any mercurial; also that the amount which it could convey was obviously insufficient to cause such a result in a healthy constitution. It then goes on to pass some strictures upon Dr. Barnes for allowing an unqualified person to dispense medicines,—it having appeared in evidence during the trial, that a young woman, a sister of Dr. Barnes, occasionally made up her brother's medicines.

Obituary.

DR. THOMAS ANDERSON, F.L.S., F.B.S.E.

Dr. Anderson was educated at Edinburgh. Wishing to follow up the study of natural history, he entered the service of the East India Company, and proceeded to India. He succeeded Dr. Thomson as Superintendent of the Calcutta Botanic Gardens, and has well sustained the reputation of an office rendered memorable by the great botanists who have held it. He was for some time Conservator of the Assam Forests, and, at his death, Superintendent of the Darjeeling cinchona plantations, where his labours had met with marked success.

About two years ago, owing to a dangerous illness, he had tol eave his family in Calcutta at a few hours' notice, arriving in England in a very low state. His health greatly improving, he set to work upon his long-deferred 'Flora of India,' which promised ere long to see the light; his favourite subject of cinchona cultivation also received a large share of his attention, especially the chemical portion of it. In the midst of his valuable work he had a relapse, and left Kew for Scotland, where it was hoped rest and quiet would restore him, but he never rallied, and died on the 26th of October last at Edinburgh. Besides his valuable reports, he published many papers on systematic botany. His enumeration of the *Acanthaceæ*, an Order previously a source of much trouble to systematic botanists, has been highly praised and admired for its lucidity and philosophical treatment. The cinchona question in him has lost an able worker, especially from a botanical point of view, for much good must have accrued from the study of them *in situ* by such an accomplished botanist.

Review.

CONCENTRIC CALCULATORS: A New and Rapid Method of Ascertaining Equivalents, without stating the Sum in Writing. By JOHN BELLOWS. Gloucester. 1870.

The very ingenious contrivance published by the author under the above title is one which, although difficult to describe in a manner that is intelligible to the reader, requires but a few minutes' study to enable any person with an arithmetical turn of mind to appreciate it as an instrument by which a great deal of time and trouble may be saved. At the same time it is so very simple in its arrangement that it might be correctly used by a child. It is adapted by the author to a series of tables, to suit all classes of persons who may require such information as is generally found in the most complete ready reckoners and interest tables. Series *A*, which is specially adapted for the use of chemists, medical students, etc., contains four tables for the conversion of (1) grammes into grains; (2) kilos and grammes into pounds and ounces avoirdupois; (3) divisions of the litre into fluid ounces, drachms and minims, and (4) hectolitres and litres into gallons and pints. No. 1 may be described briefly thus. It consists of four concentric circles revolving on a pivot, each circle containing the numbers 1 to 9 in large figures, arranged at equal distance around the inside of it. In the outside circle these figures represent decagrammes, or tens of grammes, and against each figure is placed its equivalent in grains, printed in smaller type. In the next circle inwards the large figures represent grammes, with their equivalents; in the next decigrammes, and in the inside circle centigrammes. By turning these circles on their pivot, until the large figures representing the number of grammes of which the equivalent in grains is required are in a line when read towards the centre, the sum of the smaller figures by their side will give the required answer. Thus, for example, were the equivalent in grains of 65·83 grammes required, by bringing the necessary large figures in a line as described above, the following sum will be presented:—

6	925·941
5	77·162
8	12·346
3	·463

1015·912 grains = 65·83 grammes.

The Calculators are very portable and extremely well got up. The arrangement of the type is very good, and the general appearance is all that could be desired.

BOOKS RECEIVED.

JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER CHEMIE UND VERWANDTER THEILE ANDERER WISSENSCHAFTEN FÜR 1868. Giessen. 1870.

ADDRESS ON CERTAIN ASPECTS OF MEDICAL REFORM. By D. CAMPBELL BLACK, M.D. Read before the Medico-Chirurgical Society of Glasgow. Glasgow, 1870.

AESCULAP TIDSKRIFT FÖR PHARMACI OCH NÄRBESLÄGTADE FACK.

REEN OG SUND LUFT. Efter et Foredrag af OTTO ULO. Copenhagen, 1870.

THE LIVERPOOL MEDICAL AND SURGICAL REPORTS. Edited by P. M. BRAIDWOOD, M.D., and REGINALD HARRISON, F.R.C.S. London: John Churchill and Sons, New Burlington Street; Liverpool: Adam Holden, 48, Church Street. 1870.

MEDICO-CHIRURGICAL TRANSACTIONS. Published by the Royal Medical and Chirurgical Society of London. Vol. liii. London: Longmans. 1870.

Carbonic Acid.—In a paper read in Section D of the British Association, entitled "New Physiological Researches on the Direct Action of Carbonic Acid," Dr. B. W. Richardson showed that the result of subjecting a vegetable alkaline infusion to the action of carbonic acid under pressure was a thick fluid substance, resembling the fluid which exudes from some trees. When gently dried it became a semi-solid substance, which yielded elastic fibres, and somewhat resembled caoutchouc. When the serum of blood was treated with carbonic acid under pressure and gentle warmth, 96° F., the colloidal part was separated; but when the blood, with the fibrine removed from it, was treated, there was no direct separation, the blood corpuscles seeming, for a time, to engage the gas by condensation of it. But blood containing fibrine, and held fluid by tribasic phosphate of soda, was at once coagulated by the acid. The bronchial secretion is thickened by carbonic acid, and a tenacious fluid is obtained, resembling the secretion which occurs in asthma and bronchitis, while secretions on serous surfaces are thickened and rendered adhesive.

Notes and Queries.

*** *In accordance with a wish expressed by numerous correspondents, a column will in future be devoted to notes and queries, with the object of facilitating the exchange of information among members of the trade and students.*

In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[18.]—RUBINI'S CAMPHOR.—In regard to *J. Botham's* query, the following formula will be found successful:—

℞. Alcohol, 1 part by measure.
Camphor, 1 part by weight.

Let the alcohol be prepared in the following way:—

Take of S. V. R. ℥xx.
Pot. Sub. Carb. ℥j.

Digest for 24 hours, and pour off the supernatant liquor, rejecting the residue.—J. T. R., *Warrington*.

[21.]—GLYCERINE JELLY.—In answer to *R. W. W.* (Sheffield), *X. Q. Z.* sends the following recipe for the above:—

White soft soap . . .	4 oz.
Pure glycerine . . .	6 ,,
Almond oil	3 lbs. in summer. 4 ,, in winter.
Otto of thyme	2 drachms.

Mix the soap and glycerine in a mortar, add the perfume to the oil, and rub it in gradually, taking care not to add the oil faster than it can be incorporated, or the result will not have the jelly-like appearance required.

[23.]—COLOURING FOR POMADE.—A preparation called "Aureoleine," made by Mr. Baldock, South Norwood, for the last six years, will fully answer the purpose intended, as it will stand exposure in the window for at least twelve months without fading.

If *S. W. S.* (Hull) will send his card to Mr. Henry H. Pollard, 140, High Street, Ryde, I.W., that gentleman will communicate with him respecting colouring for Pomades.

[25.]—FUMIGATION.—Generate chlorine by adding dilute hydrochloric acid to chlorinated lime placed in open dishes; or, equally good, disinfect with sulphurous acid gas, by burning sulphur in the form of match or in an open pan. Doors, windows and other outlets ought to be kept closed during the process of disinfection, and all polished steel or gilt furniture removed.—L. A. S. A.

[26.]—CHLORAL HYDRATE is given, to allay pain and produce sleep, in doses from 10 to 120 grains; 30 is the ordinary dose.—F. Goodwin.

[*** 10 to 30 is the ordinary dose.—Ed. Ph. J.]

[27.]—BENZINE.—A petroleum licence must be obtained. Generally the magistrates or other local authority will grant a licence to store a quantity not exceeding two gallons, if the case is properly explained to them. Application should be made, in the first instance, to the clerk to such authority.—L. A. S. A.

[28.]—SYMPATHETIC INK.—A solution of proto-nitrate of mercury developes black either by heat or the application of an alkaline solution, as lime-water. Glazed paper should not be used for secret writing, or it will be more or less visible on the surface. Rolled demy is better than ordinary note-paper.—J. Whitfield, *Scarborough*.

J. H. B. will find that by writing with the following solution and applying heat, the writing will become perfectly black:—

℞. Cupri Chlor. . . . . ʒi
Aquæ Dest. . . . . ℥ij.
Ft. Sol.

—A. J. Lance.

[29.]—QUININE MIXTURE.—Most trade formulæ contain only a *trace* of quinine, and a more appreciable proportion of chiretta. Quinine, producing a bulky sediment with sarsaparilla, is not much used in the combination.—Simon Pure.

[32.]—DENTISTRY.—*S. S.* will find all the necessary information with reference to diploma, or rather certificate of qualification in dental surgery, under the heading "Royal College of Surgeons, England," in the London and Provincial Medical Directory, by Churchill, which he can generally borrow of any practitioner of standing. Tome's 'Dental Surgery,' by Churchill and Sons, is the best Manual.—L. A. S. A.

SYRUPUS FERRI QUINÆ ET STRYCHNIÆ PHOSPHATUM (Easton's).—Mr. Squire's formula for the above preparation, as recommended to "*Dispenser*" in last week's Journal, has two objections. First, the quinæ sulphas is ordered to be added along with the precipitated ferrous phosphate and strychnine to the diluted phosphoric acid, instead of being converted into phosphate, which can readily be done by sodium phosphate in the same way as the other. The second objection is, the absence of sodium acetate invariably used in this and similar preparations, to ensure the occurrence of acetic acid in the solution,—sulphuric acid being a solvent of ferrous phosphate, while acetic acid is not. Let any one make the ferrous phosphate with and without the sodium acetate, and the advantage in favour of the latter will be at once apparent. In other respects the formula is good.—W. Robertson, 177, *High Street, Elgin*.

[*** Our correspondent "*Dispenser*" specified the formula given by Mr. Squire, which was therefore supplied.—Ed. Ph. J.]

QUILLAI BARK.—In answer to *A. Z.*, quillai or soap bark is the produce of the *Quillaia saponaria*, a rosaceous tree growing in South America, and there used as a substitute for soap. It has been used as a hair wash in this country.

[33.]—DISPENSING.—Will some of your readers kindly give me their opinion as to the best method of dispensing the following prescription, and the appearance it should present when completed:—

℞. Tr. Quiniæ Co. . . . ℥iss
Ammon. Carbon. . . gr. 1
Syrup. Aurantii . . . ℥ss
Aquæ . . . . . . ℥i.
M. ft. Mist. H. K.

[34.]—*J. W.* will be glad of a formula for making aq. camphoræ concent., B.P., extemporaneously.

[35.]—ROSE TOOTH-POWDER.—What is the best method of making rose tooth-powder so as to give a good pink colour?—*E. H.*

[36.]—EAU DE COLOGNE.—*B. Shakerley* (Liskeard) wishes for a good recipe for making Eau de Cologne.

[37.]—EAU DE PORTUGAL.—A correspondent wishes to know the composition of Eau de Portugal.

[38.]—SOLUBILITY OF FERRI CITRAS.—No doubt others have experienced the same difficulty as myself trying to dissolve in water, and sometimes in an acid mixture, ferri citras; and although many years have elapsed since the difficulty was remedied by the addition of ammonia or carbonate of ammonia, and finally the ammonio-citrate of iron became well known and generally prescribed, yet there are medical men now who continue to order the insoluble compound. I suppose they are not aware of its insolubility; and some of my friends, when spoken to on the subject, have readily altered it to the ammonio-citrate. But sometimes a prescription is presented containing the salt, and we have no opportunity of consulting the writer, nor of knowing how it was previously dispensed. It would be better for the profession to adhere as much as possible to the Pharmacopœia, and then we should know what is meant. I have generally put the ammonio-citrate when the citrate has been ordered, but not always. What do you advise?—J. L., *Birmingham, Nov.* 7, 1870.

[*** In a case of this kind we could not undertake to advise, but we believe the general practice is to use the soluble preparation.—Ed. Ph. J.]

Unanswered Queries.

In the event of any query remaining unanswered four weeks, the number and subject will be inserted for two weeks in the list of unanswered queries.

4. Isinglass for Brewers' Finings, p. 317.
5. Labels for Herbaria, p. 317.

Correspondence.

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

Pharmaceutical Education.

Sir,—During the discussion (on "Pharmaceutical Education in the Provinces") at the meeting of the Pharmaceutical Conference held at Liverpool, Mr. Bremridge, in a short but pithy speech, expressed exactly the opinion that I have held for some time, viz. that no master should take a youth as an apprentice unless he has previously passed the Preliminary Examination of the Pharmaceutical Society. If all masters would insist upon this it would give themselves far greater satisfaction, as they would then be able to turn out upon the world qualified assistants (unless, of course, the apprentice was a regular thick-skull), and (to me, at any rate) it is far greater pleasure to teach the sciences of chemistry and botany than to teach Latin, etc. It would also be the best thing that could be done for the would-be apprentice, as I think he would learn his Latin, etc. much better in class at school than he would at home. Any one who takes a youth as an apprentice, honestly intending to do his duty to him and to his pharmaceutical brethren, will certainly act as Mr. Bremridge suggests.

There is one more point to which I should like to call the attention of the executive of the Pharmaceutical Society, and that is the desirability of publishing more to the public the necessity of educating youths, intended to follow the profession of pharmaceutical chemists, in the Latin language. I have had many applications from farmers and first-class tradesmen in this neighbourhood, desiring to apprentice their sons to the profession of pharmacy, and in all cases to the question "Does your son know anything of the Latin language?" the answer has been in the negative.

Tamworth, October 25th, 1870. T. B. Allkins.

Pharmacy and Medical Practitioners.

Sir,—In last week's issue of the Journal I read with interest a letter, appended to which was a prescription, called by the writer of the letter "grape shot." As regards, however, the ingredients, they all seem applicable to one complaint, namely, a severe cold and cough. Not but what I think that half the number of the things would have been quite as useful.

I send you copy of recipe I made up a short time ago for a medical man, which might almost, I think, be called a panacea, as it is calculated to cure a cough, indigestion, an attack of nervous weakness, or, indeed, almost any kind of weakness, containing, as it does, five or six tonics. Here it is:—

℞. Ac. Nitric. Dil. ♏x
Ferr. et Quin. Cit. gr. x
Tinct. Nucis Vom. ♏ij
Bismuth. Nit. gr. x
Pulv. Tragac. Co. gr. x
Vin. Ipecac. ♏x
Tr. Valer. Am. ♏xx
Tr. Aurant. ʒss
Syr. ʒj
Inf. Calumb.
Aq. Menth. Pip. part. æqual. ad ℥ss.
Ft. Ht. ter die sd.

How can we get legitimate profits out of a recipe like this?

Beta.

Sir,—Being a late student in the art of pharmacy at Bloomsbury Square, I am naturally anxious, for the honour of our College, to be able to dispense any prescription which may be presented me for that purpose. The following prescription has, however, fairly puzzled me. French, German, American and other pharmacopœias have been searched in vain. In despair I ask your readers for information. Is it a relic of bygone days, when doctors exhibited as a sign a particoloured pole, and bled and shaved their customers as well; and when chemists, instead of mixing "nasty medicine," confined their attention to the conversion of ignoble metals into gold, and other similar ambitious objects? Or is it only meant to perplex country chemists, and make their clients think them fools?

As I was only able to obtain a copy, I enclose beneath a draft of this, as nearly as I could understand the cabalistic writing:—

"Mr. Scarliffe.
℞. Pulvis Cinerii gr. ij
Extr. Laxativ. gr. ij
Extr. Drastici gr. iv.
M. ft. Pil. ij h. s. bis hebdomadæ sumendæ.
℞. Liq. Alkalinæ ʒiss
Extr. Nigr. gr. ss
Infus. Amaræ ℥viij
Tinct. Amaræ ʒvj.
M. Capiat sextam partem ter in die.
Maii 17 *die*, 1869. Watson Bradshaw."

I enclose the prescription envelope for your inspection,

F. J. B., *Major Associate.*

[*** The prescription envelope sent by our correspondent bears the name of Messrs. Wilkinson, late Bridge and Co., 270, Regent Street, London, with the endorsement "Copied A. 2176." The prescription would therefore seem to have been dispensed by that firm, and probably they could furnish F. J. B. with the information he requires.—Ed. Ph. J.]

Sir,—Having read the correspondence in the Journal with regard to the concentrated form of doctors' prescribing, and the wonderful profit that "Reformer" thinks the chemist gets therefrom, I wish to enlighten him on the state of affairs in the north of London. A customer came into the shop yesterday, and, handing me a prescription, asked what I would charge for dispensing it. The following is a copy:—

℞. Pulv. Calumbæ, Pulv. Zingib.,
Sodæ Bicarb., aa ʒij
Ferri Citrat. ℈iv
Quinæ Disulph. gr. xvj
Sacch. Alb. ℥ij. Misce, ft. pulv.
Cap. i parv. ter die ex aqua.

Knowing the cutting we have to compete with here, I said 1*s*. 3*d*. The reply was, "Why, Mr. H. makes it up for 6*d*." Perhaps some of your readers will not credit this, nevertheless it is a fact, and Mr. H. is a man who places M.P.S. at the end of his name. Can "Reformer" make the chemist's bill as heavy as the doctor's at this rate? If he can, he has been brought up at a very different school to what I have.

October 25th, 1870. Assistant.

Druggists' Charges.

Dear Sir,—The following prescription was brought to my shop to be dispensed:—

Acid. Nit. Mur. Dil. . . . . . ʒijss
Liq. Taraxaci . . . . ad ℥x
Ft. Mist. s. ℥j secund. vel tert. horis.
J. B. Mulock.

My assistant, in my absence, charged 4*s*. for it. A few days after, my customer sent a friend, stating that I must have made a mistake in the price. He had it made up frequently, and never paid more than 2*s*., and only 1*s*. 9*d*. at Yarmouth and Royston. I reduced the price to 3*s*. 6*d*.; at the same time I informed him I could not believe the prescription was faithfully compounded at the low price charged. I will make no comment upon the cutting prices charged, but leave it to the consideration of my professional brethren.

A Pharmaceutical Chemist (by Examination).

Cambridge, Nov. 1870.

Sir,—Just now, when the spirit of our profession is being roused by a few medical men whose practices afford them ample time for writing, it would be well for us to bear in mind the fact that our most serious enemies are "those of our own households," and to do our utmost to reform our own ranks.

For a person to apply to us for a certain article, stating that the oilman or grocer charges for it some few pence less than ourselves, is bad enough. In this case, however, we can remark that we are chemists, leaving it to be inferred that our goods are of superior quality; but when we are told of a chemist underselling us,—it may be a neighbour,—we feel helplessly injured in pocket and wounded in mind.

I have been asked for a shilling 1*s*. 1½*d*. patent medicines, and for a 1*s*. 6*d*. pot of Liebig's Company's extract of meat; in each instance I was told that they could be obtained of chemists at the above quotations.

Now, if we look the truth in the face, we cannot fail to notice that, in spite of improved education, there is a decided falling off in the drug business; our expenses increase and our receipts decrease. This arises from two causes, over the first of which—that persons do not take nearly so much medicine as formerly, while a great deal of that which is consumed is obtained at free institutions—we have no control; but for the second surely something may be done, with proper determination on the part of the Council.

To tell us to wait a little longer, that education will do away with these miserable cutting traders, is about the same as telling us that men of talent are invariably good men. The chemist who sells spirits of nitre at 2*d*. per oz., puts up a 6 oz. mixture for 8*d*. from a prescription, or supplies 1*s*. 1½*d*. patent medicines for a shilling, is not likely to have his principles changed by any educational influences. Whatever his professions may be, what he wants is money; and he cares nothing for the honour of the Society, or the success of its members, so long as he can obtain it.

It should be borne in mind that some of these cutting establishments are large ones, and that in them young men are taught a certain mode of doing business which they in many cases carry out in other localities on their own account; and that this they will continue to do unless they are constantly cautioned against a system of business which, whilst it is certain to injure others, can never prove a source of happiness to those who adopt it.

London, Nov. 1*st*, 1870. EAST CENTRAL.

Sir,—The following came under my notice to-day, which I think ought to be made known to the trade generally:—

Having dispensed this prescription,

℞. Tinct. Lyttæ ʒiij
„ Ferri Muriat. ℥iss.
M. Capt. gtt. xxx ter die ex aqua,

I was surprised, after stating my price, to hear that it was more by 25 per cent. than the customer had ever before paid, at the same time telling me that 9*d*. was the usual price! It bore the stamps of two suburban chemists of the Metropolis. As the bottle was brought, bearing also a label of a third London chemist, I considered my charge but a fair remuneration, and was annoyed to feel that the London members of the profession should be so far behind us provincials in their prices, when they ought to be the pioneers to a better order of things.

I hope to see more uniformity in dispensing prices, which are now so irregular. "PHARMACEUTICAL CHEMIST."

Bristol, November 3*rd*, 1870.

Sir,—Your correspondent "Breasting the Hill," in the Journal of the 14th inst., alludes to the practice of non-pharmaceutists selling ordinary medicines, etc. etc., at low prices, and particularly notices sulphate of copper at 3½*d*. per lb.

Now, I believe the chemists have more to fear from each other than from outsiders.

I send you a copy of a bill circulated by a *Pharmaceutical* Chemist in a small country town south of the Thames:—

"Season, 1870.	Usual charge.
"Down's Farmers' Friend, 7*d*. per packet.........	9*d*.
"Cooper's Wheat Dressing, 4½*d*. „	6*d*.
"Best Blue Vitriol, 3*d*. per lb.	
"The above warranted genuine."	

I have seen the articles, and can testify they are as warranted.

Oct. 10*th*, 1870. M. P. S.

PHARMACY IN IRELAND.

Sir,—It was with feelings of pleasure and gratification that I perused the leading articles in the Journal of October the 22nd, with reference to Pharmacy in Ireland.

Now that the time is approaching when that very important subject, which has for so many years been left unnoticed, is about to be reconsidered, I think it a favourable opportunity of tendering a few remarks through the columns of the PHARMACEUTICAL JOURNAL, which I feel sure will be perused and receive the appreciation of many of my brother chemists in that country. It is indeed time that something should be done for them, as for many years they have had to battle against great difficulties in practising their profession.

While an assistant in a large chemist and druggist's establishment in Ireland, I had prescriptions handed me daily to dispense; but as I was not employed by a member of the Apothecaries' Hall, it would have been a breach of the law, making me liable to a heavy fine, had I done so, no matter how simple the prescription might be. For instance:—

℞. Ol. Ricini . . . . . . ℥ss
Aquæ Cinnam. . . . ad ℥ij
Cras mane sumend.

In consequence of this law the poor chemists are compelled to hand their customers over to the apothecary, and of course thereby lose the sale of other articles. In London, in the same capacity, I had the privilege of receiving and compounding as many prescriptions as the house was favoured with. As Dublin is separated from London only by a four or six hours' journey, I must confess that it appears somewhat strange that such a difference in the law should exist.

I have had many friends who served their apprenticeships in Ireland as chemists and druggists, and who had the means of opening on their own account, but had to come to England to do so; for in Ireland, their own country, they were prevented from practising the most profitable part of their business, dispensing, not being registered members of the Hall.

I think it will be admitted that a law such as this is anomalous and unjust; and I trust the Council of the Society will do their utmost to extend the Pharmacy Act to Ireland, so that the law of Pharmacy there may be assimilated to that of England and Scotland, and all Pharmaceutical Chemists, or registered chemists, with all already established there who pass the Modified, or any of the examinations of the Pharmaceutical Society, may have the privilege of dispensing and compounding. Then our brothers in Ireland will be on a par with us in England, and the monopoly which has so long stood in their way will no longer exist. Let the Pharmaceutical Society be the one recognized body of the three countries, England, Ireland, and Scotland.

A REGISTERED CHEMIST AND DRUGGIST.

London, Nov. 4*th*, 1870.

HOSPITAL DISPENSING.

Sir,—A word about Hospital Dispensing, my experience of which is limited to a fortnight, when I was lent to a hospital in the absence of one of the dispensers. What I saw during that time certainly did not encourage much hope that many of the out-patients would derive great benefit from the treatment they received. On certain days, when a popular doctor was in attendance, about 300 persons would come to see him in the course of about five hours, *i. e.* one per minute! Surely no one could in so short a time thoroughly investigate a patient's necessities, write his prescription, and make the usual entry in the hospital books. Frequently also when so many patients came, the doctor would be unable to remain long enough to give them even one minute each, and a part of them would be left to the care of a medical student, who had passed no test of his qualifications whatever. Then when the prescription was written, though the medicines were always duly labelled, they were necessarily compounded in the roughest style, minute accuracy being out of the question; and sometimes a week's supply of an infusion would be sent out when it was already rather stale, and other things in similar style.

AN UNEXAMINED MEMBER.

LOSS OF SPIRIT IN MAKING TINCTURES.

Sir,—Since looking over Mr. Umney's communication relative to the loss of spirit in the preparation of tinctures, I have referred to my own tables, which for some time past I have kept, and I find from them that the average loss has been about 4 per cent. more, which doubtless results from the use of an ordinary screw-press, instead of the more effectual hydraulic press. This amounts to a considerable loss in a year, even in a moderate-sized business; and I am consequently led to believe, with your correspondent Mr. Slugg, of Manchester, that an effective and moderately cheap hydraulic press might be manufactured for the use of pharmacists, which would be of inestimable value in the preparation of juices, etc., as well as tinctures.

Mechanicians appear to me to be, in general, very backward in ministering to the requirements of modern pharmacy, for there are several kinds of apparatus which, if made moderately cheap, would, I am sure, command a sufficiently remunerative sale. Among such I may mention the hydraulic press, a good pharmaceutical stove, and a vacuum apparatus for evaporation, etc., besides a number of less important articles. Of course these are now manufactured for the wholesale trade and a very few retail pharmacists; but the fact of their being made singly so enhances the cost of production, that only very few avail themselves of these scientific pharmaceutical appurtenances. I would therefore suggest to the notice of the Council of the Society the advisability of offering a small prize to mechanicians for each of the above articles, making the conditions for which the competitors should strive efficiency with economy of price. J. Ross Faulkner.

Ladbroke Grove Road, Nov. 1st, 1870.

Infusions of the British Pharmacopœia.

Dear Sir,—Although I had the pleasure of hearing Mr. Barnes read his excellent paper upon infusions at the evening meeting of the Society, I did not then notice that he gave the various specific gravities of the officinal preparations as compared with those made by maceration for shorter periods.

Upon reading his paper, as it appeared in the Journal, I was astonished to find that the specific gravities published ranged from 1·210 to 1·220.

Surely this must be an error?

I should imagine that 1·005 to 1·010 would more accurately represent the specific gravity of the British Pharmacopœia infusions. Charles Umney.

Laboratory, 40, *Aldersgate Street.*

Sir,—In answer to your correspondent who has discovered that the specific gravity columns in my paper on 'Experiments on Some of the Infusions of the Pharmacopœia,' are incorrect, I find that unfortunately the weight of the bottle, 207 grains, was omitted to be deducted from the weight of the 1000-grain bottle; therefore, in order to get at the correct specific gravities, it will be necessary to deduct 207, the weight of the bottle, in each case. J. B. Barnes.

Trevor Terrace, Knightsbridge, Nov. 8, 1870.

Trade Morality.

Sir,—The press is ever ready to take up the cause of justice and equity. How is it that it has so long passed over one of the greatest evils trade has ever known—an evil that is working silently, yet surely, the downfall of the middle class in England? Perhaps it is because the evil has no name, for we naturally shrink from the harsh names of covetousness and dishonesty. Shall we call it an absence of good principle, whereby our tradesman, envying his neighbour's prosperity and livelihood, conceives the idea of underselling him in some legitimate article of his trade, in the hope thereby of catching a few more herrings at the sacrifice of his neighbour's sprats, which for that purpose he sells to the public at a non-remunerative price?

As the system is rapidly on the increase, would it not be well that the public journals should ventilate the subject? The public would then be on their guard, and surely could not, if they understood it, encourage a system which, instead of tending to the general good, must end in the ruin of the entire trading class.

Examples of this system are found in grocers selling biscuits, beer and wine; bakers selling tea; drapers selling pictures, teapots, clocks, eau de cologne and general perfumery, not at a price which in itself can be remunerative, in which case there would not be the same objection, but at a price requiring the addition of larger profits on their own legitimate trade to make it pay; the result is that everybody's trade in turn is cut up piecemeal, to the injury of all and the good of nobody. If this sort of thing continues, profit will cease to exist, and, as a matter of course, the tradesman with it, and England must revert to the old feudal times when there was no middle class at all, but lords and serfs only.

If that be all that the civilization, education and enlightenment of the nineteenth century can do for us, it becomes a question whether we ought not to pause in the excessive efforts now being made in the so-called educational department, and inquire what results have already been achieved? Possibly some one will reply, "Oh, it is because we have done so little to educate the masses that this demoralization prevails." Is there not evidence that those who do such things are educated up to it—for education in the abstract contains no moral principle,—that our trading classes are well educated, and prostitute that education, and often high abilities, to commercial fraud?

Who will deny the education of the Civil Service corps? yet that body, highly enlightened though it may be, encouraged and patronized by a larger number of the higher class, has instituted a corporation of a nature utterly subversive of all trade principles and practice as hitherto understood, which, if carried out, must pauperize the kingdom by the ruin of the middle trading class, well called the backbone of the State, paying as it does, not only the largest proportion of the taxes, but the salaries of the very men who now seek its overthrow.

Perhaps to some this subject may seem inappropriate for discussion in a scientific journal; but are the professions quite clear of the moral infection which seems to be permeating all modern institutions, whether governments, professions, or trades? It is more than doubtful if there is not enough in the daily working of our own profession to set us thinking whether there is nothing to amend. Recent communications to your Journal would seem to bear me out in this. If in these few lines I have opened a subject for consideration, I shall not have thus far intruded myself on your valuable space in vain. Walter Biggs.

Hampstead.

Caution to the Trade.

Sir,—In 1863 a man came, showed me an advertisement in a paper, said he was appointing agents for his rat poison, and if I took a quantity I should be advertised as local agent. I did so, and soon afterwards (by a caution in the Journal) I found others had been victimized also.

After closing on Monday I went out, and was surprised to find on my return that the rascal had called again, and represented to my assistant that I had ordered three dozen, to be paid for on delivery. Perhaps you will kindly caution the trade again in the Journal. Henry Long.

High Street, Notting Hill, Nov. 8, 1870.

"*Audi Alteram Partem*" thinks that the writer in the *Lancet*, who says that the rate of profit charged in chemists' prices is "much too high," has fallen into the error of comparing pharmacy with other trades, from which it differs in the limited demand for the articles supplied, and the superior education it requires. While few druggists take £25 a week, many grocers and drapers take ten times that amount, and consequently they can sell their goods at a much lower rate of profit. In no case does the proverb "cheap and nasty" prove truer than in the sale of drugs; and it is doubtful whether, as a rule, cutting druggists get a very much larger amount of custom than those who adhere to respectable prices. Our correspondent is of opinion that doctors who dispense their own medicines prescribe medicine very different from that of the non-dispensing physician, and that their shelves are often very imperfectly furnished, as would appear from a letter lately published in the *Lancet*, in which the writer says of another practitioner that he did not keep such articles as glycerine or carbolic acid in stock.

T. Appleton (Fulham).—The volume will consist of the numbers for a year, and the Index will be issued as soon as the volume is completed.

"*Inquirer.*"—No person would be entitled to call himself a Member of the Pharmaceutical Society on going into business until he had passed the Major Examination and been elected by the Council of the Society.

S. C. Furmston (Richmond).—The fourth edition of Pereira's 'Materia Medica' was published in 1854, by Messrs. Longmans. The work has been considerably altered and enlarged since 1840.

E. S. Presley (Bristol).—He would be liable.

G. H. Strickland.—Apply to the Secretary.

Pharmaceutical Titles.—We have received letters on this subject from "An Associate," L., A. E. J., "Agitator," J. C., "Theta," "Aspirant to the Major," but as the correspondence is closed, we cannot insert them, more especially since they do not throw any new light on the questions at issue. The latter-named correspondent approves of Mr. Allkins's idea of a petition, but thinks many would be unable to attend a meeting in town, and suggests that some one should take the initiative by preparing a petition and advertising for signatures to be sent to him. We should advise our correspondent to communicate with Mr. Allkins by letter.

The following journals have been received:—The 'British Medical Journal,' Nov. 5; the 'Medical Times and Gazette,' Nov. 5; the 'Lancet,' Nov. 5; 'Nature,' Nov. 3; the 'Chemical News,' Nov. 4; 'Journal of the Society of Arts,' Nov. 3; 'Gardeners' Chronicle,' Nov. 5; the 'Grocer,' Nov. 5; the 'English Mechanic,' Nov. 4; the 'Produce Markets Review,' Nov. 5.

STARCH FOR THE MICROSCOPE.

BY M. C. COOKE, M.A.

It may be presumed that the time is past when the microscope required an apologist. For the use of such an assistant in the detection of adulteration, or in the discrimination of minute bodies such as starch granules, no advocate is needed, because it has become a necessity. Even the practised microscopist, as well as the occasional experimentalist, are constantly being made aware by experience, either of small errors in observation or greater errors in the preservation of microscopic objects. Perhaps as interesting and useful a series as any that could be recommended to the majority of the readers of this Journal, would be a long and well-authenticated series of starches. Unfortunately, however, these are best observed when mounted in fluid; and when thus prepared, two serious charges of condemnation are liable of being pronounced against them. Both these failures having occurred in my own cabinet, I venture to warn others, in the hope of preserving them from similar disappointment. The first charge may be preferred against all fluid mountings, that if left alone, even when flat, for a few years, the gold size or other substance of which the ring, or shallow cell is composed, flows in and discolours the starch, or there is a tendency to leakage, minute it may be, but enough to become annoying. The second charge is a far more important one, and that to which I desire more particularly, and specially, to direct attention. All starches mounted in fluid of any kind that I have seen employed, exhibit in the course of time a great tendency to change, so much so that in many instances they become of little or no value as tests in the comparison of closely allied forms. Some have become utterly valueless in four or five years. The only safeguard that I am prepared to recommend is that which I am now adopting, of mounting with every specimen that is put up "in fluid" a duplicate mounted "dry." Both can be accommodated on the same slide, which for many reasons is preferable; still, with all drawbacks, starch mounted dry is not liable to change, and to become so utterly valueless, as when mounted in fluid. The more delicate the starch, the more fatal the change. By comparing freshly mounted specimens with old ones, this change is painfully manifest.

Besides mounting starches dry, which only require a ring of old gold-size the size of the cover, and no deeper cell, they may be put up in balsam, or in balsam and chloroform, or in gum dammar dissolved in benzine. Pale copal varnish is not at all a bad substitute for balsam in mounting, but not so good as the gum dammar dissolved in benzine. Select a nice clean piece of dammar, break it up and place in a wide-mouthed bottle, cover well with benzine, let it stand till dissolved, shaking occasionally, and if too thick, add more benzine, until when well mixed it drops freely. If too thin, by leaving the bottle open the benzine will soon evaporate sufficiently to obtain the desired density. In the course of time this medium is sure to become too thick for use, but the addition of benzine, stirring all together, and then allowing it to stand until perfectly clear, will soon remedy this defect. If this substance had but a fair trial, I think, as no heat is required in mounting, that it would almost wholly supersede balsam. In fact, I have never used a drop of balsam for anything since I became acquainted with "dammar in benzine."

This communication would hardly be complete without a reference to the methods which may be, or are, employed in mounting starches for the microscope. Besides the dry method, and mounting in resinous media, the following have been recommended:—

Camphor water is one of the common media that are employed for starches and other vegetable organisms. A lump of camphor is placed in a bottle of distilled water, so that as much of it as possible may be dissolved. One grain each of baysalt and alum are added for each ounce of water, or a drop or two of creasote is shaken up with each ounce of water, which is afterwards filtered.

Glycerine is also used, especially when diluted with two parts of the above camphor water. It is worthy of remark that when glycerine is employed as a medium, gum dammar in benzine is excellent for securing the covers, because the exudation of any small quantity of the glycerine around the edges of the cover is no obstacle to the adherent properties of the dissolved dammar. In fact, a drop of glycerine may be let fall upon the centre of a slide, starch may be dusted over it, a thin cover, round or square, laid on and pressed flat, and held by a clip; all the glycerine which is pressed out beyond the edges of the cover may then be wiped away, and gum dammar in benzine run round the edges of the cover. In twenty-four hours the dammar is dry enough to remove the clip, and in a few days the slide may either be covered with paper, or the dammar may be trimmed off a little, and a coat of black varnish painted over it. If not used for starches, this mode of mounting is good for many objects, and glycerine is much more manageable than by any other method, owing to the greater affinity between the glycerine and benzine.

Glycerine and gum, mixed in the following proportions may be used: one ounce each of gum arabic, glycerine and distilled water, with one and a half grains of arsenious acid. The latter is dissolved in the cold water, then the gum, and lastly the glycerine are added and mixed.

Castor oil is a very troublesome fluid to use, but it has been employed for starch, though with no corresponding advantage.

Alcoholic fluids are always objectionable, on account of their solvent power upon most of the substances used for securing the covers.

Of all the media employed for starches, where employed at all, none are equal in my estimation, not even balsam, to gum dammar dissolved in benzine. When the polariscope is to be used, this plan should be adopted, and certainly no one would suppose an examination of starch complete without the aid of polarized light.

In his recent lectures on "Microscopical Manipulation," Mr. W. T. Suffolk has expressed similar views on this subject. "A series of starches from various plants should be mounted and kept for comparison. Two slides of each should be prepared, one dry, the other in balsam for examination with the polariscope. When starch is mounted in balsam, care should be taken to employ as little heat as possible. Starch granules are not well preserved in fluids." The use of "dammar" instead of "balsam" obviates the employment of heat at all, and consequently is preferable. In conclusion, I would enforce the advice to mount all starches for the microscope "dry" and in "dammar," but by no means to place reliance upon slides containing starch mounted in glycerine, camphor water, or fluids of any kind which maintain a condition of fluidity.

THE PURGATIVE ACTION OF ALOES.

BY T. AND H. SMITH.

In the 19th number of the Pharmaceutical Journal, there is published the report of a paper read by Mr. William Tilden, B.Sc., before the British Pharmaceutical Conference at Liverpool, entitled "A few Notes on Aloes." In this paper Mr. Tilden gives some very valuable information concerning the chemical properties of the drug, and we have much pleasure in bearing testimony to the ability of his researches, but, at the same time, we feel called upon to notice one or two points in his paper, on which we conceive his deductions to be erroneous.

He states that the active constituent of aloes is still unknown; that Robiquet first showed that the purgative property was not due to aloin; and he asserts that this latter substance is in complete disuse.

On these points we entertain entirely diverse opinions, and as the discoverers, and as far as we know the only manufacturers of aloin, we claim to some little knowledge of its chemical and therapeutical properties.

Mr. Tilden enumerates and describes four substances said to be present in aloes of the best quality, viz. :—

(1.) Aloetin, aloesin, amorphous aloin, bitter principle of aloes.
(2.) Crystallized aloin.
(3.) Resin.
(4.) Aloesic acid.

Of these four Mr. Tilden disbelieves in the existence of one, viz. aloesic acid, and adduces a reason why (3) resin should be related to the soluble portion of aloes. Of aloetin he remarks that it is very important as to quantity, and there can be no doubt it is the product of the alteration of crystallized aloin. He regards it as a mixture of crystallized aloin, capable of recovering its crystalline condition in presence of water and brown oxidized matter. We have many and various reasons for at present coinciding to some extent with Mr. Tilden in these remarks, but we are entirely at a loss to imagine to what substance he would attribute the purgative action of aloes, since he denies that aloin has any such effect, and yet concludes that aloes absolutely consists of that substance and products of its decomposition.

It is well known that the medicinal powers of aloes are not equal in different samples; that of two samples of the same variety, one may possess twice the purgative action of the other, and that when the varieties are different, the difference in medicinal value is in many cases even more marked.

The idea of an active principle is generally tenaciously associated with something such as strychnia or aconitia, of infinite power in small doses; but there are very many active principles, it must be remembered, the powers of which are not very many times greater than those of the drugs from which they are obtained, and, in this present case, taking Mr. Tilden's results, he could not possibly expect that aloin would have more than five times the power of good aloes, inasmuch as he obtains more than 20 per cent. of the principle from the drug.

If it be admitted that aloin is the active purgative principle of aloes, one manifest advantage from using it would be that we have therein a medicine of unvarying strength, and we possess what we judge to be conclusive evidence that there is no other substance of value in aloes, and that in all cases where aloes of best quality will produce purgation, a proportionate dose of aloin will be of equal and more certain effect.

When Robiquet, in 1856, published his research on Aloetin,* he denied that that substance (which he seems to have supposed identical with aloin) had any purgative effect. At the time we contemplated publishing a denial of this, but the late Sir James Simpson happening to visit our works, we mentioned our intention to him, when he dissuaded us, observing that medical men were quite sufficiently convinced of the power of aloin, and that he frequently prescribed it and often took it himself, and with unvarying good effect. We could name very many other medical men, of undoubted eminence, who constantly prescribe it in preference to aloes, finding that it has in no case any ill effect, and that there is never any need to give an increased dose when its use is regular and long continued. Our own personal experiences bear out these statements, and our commercial transactions give most emphatic testimony that the demand is not decreasing. Since its first discovery, our manufacture has increased from a few pounds to many thousand ounces yearly, and, although we have not arrived at Mr. Tilden's gratifying result of 20 per cent., yet, by recent improvements in our manufacture, we shall be able to produce it at about two-thirds its present price, and we find the dose requisite to be aloin to aloes, as 1 is to 5. We should be happy to forward that gentleman a few doses for purpose of trial, should he wish it.

Edinburgh, November 12th, 1870.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Æther.—Sulphuric acid and rectified spirit mixed together develope considerable heat, and if the mixture is distilled, ether is one of the products which find their way into the receiver. The process thus simply conducted, however, speedily comes to an end, so far as the production of ether is concerned. The plan adopted in the Pharmacopœia is therefore that known as the continuous process.

Sulphuric acid is mixed with rectified spirit, and the mixture heated to ebullition in a distillatory apparatus furnished with a good condenser; this is continually supplied with a stream of spirit [run in by a tube leading from a reservoir] at such a rate as to supply the place of that which undergoes etherification, and therefore distils over. The explanation usually given of this reaction is somewhat as follows:—the spirit and sulphuric acid give, by their mutual decomposition, water and an acid, the ethylsulphuric, or sulphovinic.

* *Journal de Pharmacie*, tome xxix.

$$C_2H_5HO + H_2SO_4 = C_2H_5HSO_4 + H_2O.$$

[The presence of this compound can be shown by saturating the liquid with chalk, and evaporating down the filtered solution: a soluble crystallizable salt $(C_2H_5)_2Ca''(SO_4)_2$ results.]

Heated, this compound is decomposed by alcohol, giving, at a temperature of 280° to 300° F., ether and sulphuric acid.

$$C_2H_5HO + C_2H_5HSO_4 = (C_2H_5)_2O + H_2SO_4.$$

The ether and the water formed by the first reaction distil over together; the sulphuric acid thus regenerated remains behind to pass again through the same changes. A little alcohol distils over unchanged, and a small quantity of sulphurous acid accompanies it; these are removed from the distillate by agitating with slaked lime and a strong solution of chloride of calcium, the ether is then redistilled.

It is important in this process to observe the proportions in the boiling mixture, so that the temperature may neither be too low (when little but spirit would pass over), nor too high (when the ether would be contaminated with oil of wine).

Ether may be formed from alcohol by the action of many other bodies. Doubtless the explanation of its production by sulphuric acid just given is correct, but in other cases, as in the action of chloride of zinc, the alcohol seems simply to lose the elements of water,—the residues of two molecules becoming condensed into one.

$$\left.\begin{matrix} H \\ C_2H_5 \end{matrix}\right\} O \quad \left.\begin{matrix} C_2H_5 \\ H \end{matrix}\right\} O \; - H_2O = \left.\begin{matrix} C_2H_5 \\ C_2H_5 \end{matrix}\right\} O$$

Ether, though of low specific gravity as a liquid, forms a very heavy vapour. This would be inferred from its formula, $(C_2H_5)_2O\,(= 74)$ forming the same volume of vapour as $H_2\,(= 2)$. It is, therefore, 37 times heavier than hydrogen, and $37 \times \cdot 0693$ (the sp. gr. of H) $= 2\cdot 564$ times heavier than the air.

Pure ether agitated with water takes up of that liquid about $\frac{1}{35}$ of its volume; whilst it dissolves in about 9 or 10 times its volume of water. Ether is used as a solvent, chiefly of fatty matters, and in the Pharmacopœia for other purposes. As a solvent, benzol or purified bisulphide of carbon might in some cases be advantageously employed instead of ether. The valuable properties of these liquids have been somewhat overlooked in pharmacy.

Alcohol Amylicum.—This liquid is employed in the Pharmacopœia as the source of valerianic acid and valerianates. The acid is derived from it by boiling with oxidizing agents, of which a mixture of bichromate of potash and sulphuric acid is the most frequently employed. Ordinary amylic alcohol is an alcohol belonging to the same series as wood-naphtha (methylic alcohol) and common spirit of wine (ethylic alcohol), and it gives products of oxidation and other derivatives similar to those obtained from those bodies. Thus, the formation of formic, acetic and valerianic acids is shown in the following equations:—

$$\underset{\text{Methylic alcohol.}}{CH_3HO} + O_2 = \underset{\text{Formic acid.}}{CHHO_2} + H_2O.$$

$$\underset{\text{Ethylic alcohol.}}{C_2H_5HO} + O_2 = \underset{\text{Acetic acid.}}{C_2H_3HO_2} + H_2O.$$

$$\underset{\text{Amylic alcohol.}}{C_5H_{11}HO} + O_2 = \underset{\text{Valerianic acid.}}{C_5H_9HO_2} + H_2O.$$

In either of these the oxygen of the air may be employed (through the agency of platinum black) or nascent oxygen developed from some oxidizing mixture.

The Pharmacopœia is hardly correct in treating fousel oil as identical with amylic alcohol. Fousel oil differs considerably in character, according to the sources from which it has been procured, some samples containing no inconsiderable proportions of other alcohols, such as butylic, which would yield butyric acid, $C_4H_8O_2$. Probably much of the valerianate of soda prepared from fousel oil contains butyrate. The characters indicated in the B.P. as belonging to amylic alcohol should be more definitely stated.

(To be continued.)

A COMBINED SOLUTION OF PEPSINE AND PANCREATINE.*

The value of pepsine as a remedial agent in cases of indigestion is generally admitted, but experience has proved that it is only in certain forms of indigestion that it is of use.

Food is divided into two classes, nitrogenized and unnitrogenized. The former, being digested in the stomach, is acted on by pepsine; the latter, digested in the intestine, escapes its action almost altogether. The only action pepsine, as it appears in the gastric juice, seems to have on fat is to dissolve the albuminous cell-wall, so leaving the fat free to be acted upon by the pancreatic secretion. This suggests a probable cause of indigestion; for if the gastric fluid be deficient in quantity or quality, the albuminous cell-walls of the fat may not be dissolved, the fat is not acted on sufficiently by the pancreatic secretion, and not being emulsified, cannot be taken up by the lacteals. On the other hand, diseases of the pancreas or intestine, by checking the absorption of fat, may cause indigestion incurable by pepsine. This indigestion should be treated by pancreatine, the chief action of the pancreatic secretion being the emulsion of fats.

There being two classes of food to be digested, each in a different portion of the digestive tract, it is evident that the more perfectly one is digested the more easily will the other be. If the stomachic digestion be weak, the fat granules are not set free nor the fibrine dissolved as they should be; the consequence being that the pancreatic secretion cannot do its work properly. If the intestinal digestion be weak, the emulsifying of the fats as they pass from the stomach being imperfectly performed, the food is detained longer in the stomach than is right, the proportion of fat to fibrine is increased, the fat enveloping the nitrogenized food hinders the action of the gastric juice, and acidity and stomachic indigestion are produced. In treating stomachic indigestion, therefore, it is important to accelerate the digestion of fatty and saccharine portions of the food; and in intestinal to accelerate and perfect the digestion of the albuminoids. There are also cases in which the digestion of both the nitrogenized and unnitrogenized food is at fault.

Impressed with the foregoing ideas, Mr. Edward Long, of Dublin, sent to the author a sample of his solution of pepsine in glycerine, asking him to try it in practice, and give his opinion upon it. The author, however, thought that a solution of pepsine and pancreatine, combined in suitable proportions, would fulfil the conditions necessary for a perfect digestive; he therefore suggested to Mr. Long the preparation of such a solution. The result of the experiment is given in a letter from

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* Abstract of a paper by Richard John Kinkead, B.A. and M.T.C.D., in the *Lancet*, no. xx. vol. ii. 1870.

Mr. Long to the author, from which we give the following extracts:—

"Following up the subject of our conversations some time since, I have been making experiments on pancreatine obtained directly from the fresh pancreas of the calf. The result has been quite what might have been expected from *à priori* reasoning, as you will see from the subjoined statements.

"Some difficulty was experienced in obtaining the solution of pancreatine in an eligible form for administration; but at last I succeeded in producing what as closely as possible represents the digestive fluids found in man. It is composed of pepsine and pancreatine in suitable proportions, using for the former a solution of pepsine introduced by me some time ago, and adding the solution of pancreatine as now prepared.

"In the experiments made to test its effects a very curious result was observed. Meat—beef and mutton—digested in pepsine alone was found to be entirely dissolved with the exception of the fat, which floated as a film on the surface, and this film was entirely emulsified when a proper quantity of pancreatine was added, and the usual conditions as to temperature, etc., attended to. This is exactly what we might expect, reasoning from known physiological principles.

"Pepsine in an effectual form has been a great boon; but, as I have shown above, it will not digest the oily or fatty aliments; failing thus to supply the system with the substances vitally necessary in strumous diseases. It is obvious how desirable the action of this fluid will be as an addendum to the use of cod-liver oil.

"The pancreatic emulsion has never seemed to me the nicest or most eligible mode of effecting what is desired. It is nauseous to the taste of many, and often keeps badly; the quantity of mutton suet employed, which may be supposed to be all the fatty matter the pancreatine present is capable of emulsifying, is not as much as might be desirable in many cases. In some, suet at all may not be the most suitable form of fat. The fluid I now describe is very palatable, and will keep almost any time. It may be given with any kind of food. My experiments were made with fat mutton-chops and rich beef-steaks, as typical aliments, with most satisfactory results.

"The first experiments, thrice repeated, were made with muriatic acid, water, and the combined solution, to represent the gastric juice and pancreatic secretion. The second, with solution of pepsine alone, with acid and water, followed by the addition of the plain pancreatic solution after an interval of two hours. Both were entirely satisfactory; but the latter were peculiarly interesting in a physiological point of view, as stated above, and tended to show the exact part played by each fluid in the animal economy. But as the administration of two fluids in succession would be troublesome in practice, and be scarcely attended to by patients (at all times averse to trouble), I have thought it desirable to mix the two in one fluid. This has the advantage of being quite agreeable, as liquor of pepsine always is; while the taste of the liquor of pancreatine is entirely concealed by the former. Some medical friends of mine reported most favourably of it, after trial in practice.

"The experiments in the laboratory were as follows:—

"No. 1.—Mutton (fat and lean about equal parts), one ounce; water, one ounce and a half; muriatic acid, fifteen minims; solution of pancreatine and pepsine, one drachm. Digested at 100° for four hours, this was converted into a homogeneous pulp, and, when diluted with a little water, presented quite a *chylous* appearance.

"No. 2.—Beef (fat and lean), an ounce and a half. Treated in the same way, with same result, the pulp being much deeper in colour.

"Nos. 3 and 4.—I then operated on the same quantities of each, first digesting with pepsine solution alone, as intimated above, and then adding the liquor pancreatine—keeping up the heat. In these latter experiments the result seemed more perfect, but, as I have said, the same procedure would be rather inconvenient in practice.

"The results were found to be identical in three successive experiments, at intervals of several weeks."

THE PRESENT STATUS OF POTASH PRODUCTION.*

From being the most abundant and cheapest of the alkalies, potash has rapidly passed to the position of the most expensive; and one of the chief problems in technical chemistry is comprised in the efforts to lessen its consumption by the substitution of other bases, or to cheapen and increase its production by the utilization of the abundant raw materials offered by the mineral kingdom. The first step has, in many instances, been successfully accomplished by the employment of soda, ammonia or lime, as basic factors to accomplish a given result previously and almost exclusively brought about by potash. Thus, the pure potash alum has almost disappeared from the markets, its place being assumed by a chemical equivalent in which at least one-half of the original potash is replaced by ammonia—an ammonia potash alum. So also the manufacture of the somewhat useful chlorate of potash was formerly effected by the passage of chlorine gas into potash solution,—a process resulting in the production of five equivalents of the much less valuable and less useful chloride of potassium for each equivalent of the desired salt. Now, a mixture of lime and potash is employed, and chlorate of potash and chloride of calcium are produced. These two salts are much more readily separated by crystallization than were the two products of the old method; at the same time a great saving of potash is effected, 46 parts of caustic alkali producing nearly 323 parts of chlorate, where formerly upwards of 336 were required for the same operation.

In spite of these and similar substitutions, potash becomes scarcer. We cannot get rid of its use entirely. There are many important technical operations in which it is, as yet, a *sine quâ non*, and some in which it must always remain such. In the production of a pure crystal glass soda cannot replace potash, since it imparts a greenish hue to the product. Nitrate of soda cannot be substituted for saltpetre in the manufacture of gunpowder, though it has already taken off the burden from the nitrate of potash in very many of the operations of the manufacturing chemist. In the formation of the simple and compound cyanides, potash will probably always be a requisite.

Hence, new sources of supply must be sought after and be made available. The slow process by which the vegetable kingdom extracts and assimilates the valuable potash from mineral matter must be replaced by the quicker changes of art operating on the same substances. The original forests of America—one of the great centres from which potash has been sent into commerce—are so rapidly disappearing or finding such manifold uses and demands for their woods and timbers that the old source of supply and means of production—that from the incineration of terrestrial vegetation—are fast losing their prominence by the supersedure of new raw materials and new methods of manipulation. We procure potash now by the incineration of marine and littoral plants, as well as those of the land. We derive it from inorganic nature by the decomposition of feldspar and other potash-bearing minerals, and by the treatment of certain material from the rock-salt mines of Prussia. Even the animal kingdom has been placed under contribution towards the same end. Let us examine into these several sources, and arrive at the present status of potash production the world over, omitting, however, the old source

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* Abstract of a paper in the *Scientific American*, by Professor Charles P. Williams.

of the ashes of land vegetation, as being sufficiently familiar to require nothing further than mere mention.

In the salt-deposits which underlie the variegated sandstone of Stassfurt, Prussia, a mass of carnallite (a double chloride of potassium and magnesium) has been discovered, equal to 6,000,000 tons of chloride of potassium. Large quantities of this deposit, amounting to 150,000 tons in 1866, are worked into chloride of potassium. From 20,000 to 30,000 tons of 82 per cent. chloride are now annually produced in this locality, and find ready sale at about $40 per ton.

Feldspar, containing about 13 per cent. of potash, has been proposed as a source of one alkali. Lawrence suggests its extraction, in the form of caustic or carbonate, by mixing the finely-pulverized orthoclase with sawdust and straw, and arranging the mixture in heaps, which are to be damped from time to time with urine or some other nitrogenous liquid. After undergoing for six months this process of decomposition through fermentation, the materials are mixed with a thick cream of lime, made into bricks, and calcined at a high temperature. By leaching this residue, the potash dissolves, and silicate of lime, etc., remain behind.

Hack proposes to heat the mineral with lime, and to treat the calcined mass with water under a pressure of eight atmospheres, for the production of a strong lye, through which carbonic acid is passed for the precipitation of silica and alumina, and for the formation of carbonate of potassa. Meyer's plan is essentially the same as Hack's. Ward uses fluor-spar with lime for the decomposition of feldspar for obtaining the potash. None of these methods have as yet been utilized on a practical scale, but doubtless, in time, some of them, as well as those of Wurtz and Tilghman, for extracting the alkali as chloride or sulphate from greensand marl or feldspar, will become technically important.

From about 22 tons of wet seaweed there are, on the average, produced somewhat more than 500 pounds of chloride of potassium, in addition to bromine, iodine and various soda salts. This source of potash has, however, since the discovery of the Stassfurt deposits, become of minor importance; but the weeds still continue to be collected, mainly for the extraction of the bromine and the iodine, more especially for that of the latter.

About twenty-five years ago it was suggested by Dubrunfaut that the molasses from the manufacture of beet-root sugar could be utilized in the production of potash compounds, by first converting uncrystallizable sugar into alcohol, which is distilled off, and subsequently evaporating the liquor to dryness and incinerating the residue. According to Payen, the ash of this molasses contains 49·88 per cent. of potash soluble in water, and 1·7 per cent. insoluble. This plan was first carried into practice at the distillery of Serret and Co., but has since been adopted on a large scale at several places in both France and Germany. The establishment at Waghauselin, Baden, annually produces upwards of 300 tons of commercial potashes, containing from 88 to 94 per cent. pure carbonate of potash.

In 1862, Dr. Hoffmann, in his report on the London Exhibition, called attention to a new source of potash utilized in certain parts of France, more especially at the great seats of the woollen manufacture, as Rheims, Fourmies, and Elbœuf. Here the liquors in which more than 27,000,000 kilog. of sheep's wool are washed are bought for the "suint" they contain. This "suint" is a compound of potash with a peculiar nitrogenous animal acid, about which but little is known, which was first pointed out by Chevreul as forming no less than a third of the weight of raw merino wool, and a somewhat less proportion of ordinary, coarser wools. It forms on the average about 15 per cent. of the weight of raw fleece, and is exceedingly soluble in cold water. The washings of the amount of fleece above given would give, according to J. Lawrence Smith, about 1,167,750 kilog. of pure potash, worth, at the average rate of American potashes, from $400,000 to $450,000. The process of extraction is a simple one, and consists simply in boiling the washing-liquor down to dryness, and calcining the residue, which somewhat resembles baked molasses in appearance, in retorts with the production of gas, tar, and ammoniacal liquid, together with a coke-like substance which is leached. From the solution thus obtained, sulphate, chloride and carbonate of potassa, *free from corresponding soda compounds*, are separated by continued evaporation.

PHARMACY BILL FOR IRELAND,

PROPOSED BY

The Governor and Company of the Apothecaries' Hall, Dublin.

DRAFT BILL.

To regulate the Practice of Pharmacy in Ireland, to institute a Pharmaceutical Society, and to alter and amend the Act passed by the Parliament of Ireland, in the thirty-first year of the reign of his Majesty George the Third, intituled "An Act for the more effectually preserving the health of his Majesty's subjects, for erecting an Apothecaries' Hall in the City of Dublin, and regulating the profession of an Apothecary throughout the kingdom of Ireland."

Whereas it is expedient, to enable the governor and company of the Apothecaries' Hall of Dublin to grant licences to persons (other than duly qualified Apothecaries), to assume the name of Pharmaceutical Chemists, and to keep open shop for the retailing, dispensing, or compounding of prescriptions of duly qualified medical practitioners, and also to grant certificates enabling persons to be engaged or employed as students, apprentices, or assistants, respectively.

And whereas, it is expedient and necessary that such persons should possess a competent practical knowledge of their business, and to that end, that from and after the day herein named, all persons should, before commencing such business, be duly examined as to their qualifications and practical knowledge, and that a register should be kept, as herein provided, and that there should be instituted a Pharmaceutical Society for Ireland, and also that the Act passed in the Parliament of Ireland, in the thirty-first year of his Majesty George the Third, intituled "An Act for the more Effectually Preserving the Health of his Majesty's Subjects, for erecting an Apothecaries' Hall in the City of Dublin, and Regulating the Profession of an Apothecary throughout the Kingdom of Ireland," should be amended:—

Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:—

1. From and after one thousand eight hundred and seventy-one, it shall be unlawful for any person, other than a duly qualified apothecary, to sell or to keep open shop for retailing, dispensing, or compounding medical prescriptions in Ireland, unless such person shall be a pharmaceutical chemist within the meaning of this Act, and be registered under this Act.

2. Pharmaceutical chemists within the meaning of this Act shall consist of all persons who shall be duly examined and licensed in pharmacy, and registered as pharmaceutical chemists under the provisions of this Act.

3. The examiners for the purposes of this Act shall consist of the governor or deputy-governor, with six members of the Court of the Apothecaries' Hall, who examine on the subjects specified in clause 4 of this Act, together with six other examiners selected by members of the Pharmaceutical Society of Ireland, provided that until said conjoint Board be formed, the examinations may be carried on for the time being by the aforesaid members of the Court of the Apothecaries' Hall.

4. All such persons as shall have been so appointed to conduct examinations under this Act shall be, and the

same are hereby declared to be, fit and proper persons to conduct all such examinations as are provided for or contemplated by this Act, and shall respectively have full power and authority, and are hereby authorized and required to examine all persons who shall present themselves for examination under the provisions of this Act in their knowledge of the Latin and English languages, in arithmetic, in botany, in materia medica, in pharmaceutical and general chemistry, in practical pharmacy, in the British Pharmacopœia, and such other subjects, as may from time to time be determined, by any bye-law of the General Council of the Pharmaceutical Society of Ireland. Provided always, that such examinations shall not include the theory and practice of medicine, surgery, or midwifery, or any branch of medicine or surgery; and the said examiners are hereby empowered to grant or refuse to such persons, as in their discretion may seem fit, certificates of competent knowledge and qualification and skill to exercise the business or calling of pharmaceutical chemists, or, as the case may require, to be engaged or employed as students, apprentices, or assistants, respectively; provided, nevertheless, that in case of rejection, a rejected candidate may present himself for re-examination after six months.

5. The Council of the Pharmaceutical Society of Ireland shall, within three calendar months after its formation, appoint a fit and proper person to act as Registrar under this Act, and said Council shall have power to remove the said registrar, or any future registrar to be appointed under this Act, from said office, and from time to time to appoint a new registrar in the room of any registrar who may die or retire, or be removed from office, as aforesaid, and also to appoint and remove from time to time a treasurer, and such clerk and other officers as may be requisite for carrying out the purposes of this Act, and also to pay suitable salaries to the said registrar, treasurer, clerks, and officers, provided that pending the formation of such Society, the Governor and Council of the Apothecaries' Hall shall appoint fit and proper persons as registrar, treasurer, clerks, and officers.

6. For every examination and registration, and for every certificate of same, such reasonable fees or charges shall be paid as shall from time to time be fixed and determined by any bye-law to be made by the General Council of the Apothecaries' Hall of Dublin, or by the Council of the Pharmaceutical Society, as the case may be, provided always, such fees or charges shall at no time exceed the fees laid down respectively in each case in Schedule (A) to this Act annexed, and such fee shall be paid to the treasurer, and shall by him be applied as the said Council of the Apothecaries' Hall or of the Pharmaceutical Society shall direct in furtherance of the provisions of this Act.

7. The registrar to be appointed under or by virtue of this Act shall from time to time make out and maintain a complete register of all persons certified as pharmaceutical chemists by the examiners appointed under this Act, also of all persons certified in like manner as apprentices, students, or assistants, respectively, and shall keep a proper index of the register, and all such other registers and books as may be necessary for giving effect to the bye-laws which shall from time to time be made in conformity with the provisions of this Act.

8. It shall be the duty of the registrar to make and keep a correct register, in accordance with the provisions of this Act, of all persons who shall be entitled to be registered under this Act, and to erase the names of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act. To enable the registrar duly to fulfil the duties imposed upon him, it shall be lawful for the registrar to write a letter to any registered person, addressed to him according to his address on the registrar, to inquire whether he has ceased to carry on business, or has changed his residence, such letter to be forwarded by post as a registered letter, according to the Post-Office regulations for the time being; and if no answer shall be returned to such letter within six months from the sending of the letter, a second of similar purport shall be sent in like manner; and if no answer be given thereto within three months from date thereof, it shall be lawful to erase the name of such person from the register, provided always, that the same may be restored by direction of the Council of the Apothecaries' Hall of Dublin, or of the Council of the Pharmaceutical Society, as the case may happen to be, should they think fit to make an order to that effect.

9. No name shall be entered in the register except of persons authorized by this Act to be registered, nor unless the registrar be satisfied by the proper evidence that the person claiming is entitled to be registered; and any appeal from the decision of the registrar may be decided by the Council of the Apothecaries' Hall of Dublin, or of the Pharmaceutical Society, as the case may be; and any entry which shall be proved to the satisfaction of such Council to have been fraudulently or incorrectly made, may be erased from, or amended in, the register, by order in writing of such Council.

10. The registrar shall, in the month of January, in every year, cause to be printed, published, and sold a correct register of the names of all pharmaceutical chemists, and a correct register of all persons registered as students, apprentices, and assistants, and in such registers respectively the names shall be in alphabetical order, according to the surnames, with the respective residences, in the form set forth in schedule (B) to this Act, and such printed registers shall be called "The Registers of Pharmaceutical Chemists, and of Pharmaceutical Students, Apprentices, and Assistants for Ireland," and a printed copy of such registers for the time being, purporting to be so printed and published as aforesaid, or any certificate under the hand of the said registrar, and countersigned by the Governor or two members of the Council of the Apothecaries' Hall of Dublin, or by the President or two members of the Pharmaceutical Society, shall be evidence in all courts, and before all justices of the peace, and others, that the persons therein specified are registered according to the provisions of this Act, and the absence of the name of any person from such printed register shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the provisions of this Act.

11. Any registrar who shall wilfully make, or cause to be made, any falsification in any matter relating to the said registers, and any person who shall wilfully procure, or attempt to procure, himself to be registered under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding or assisting him therein, shall be deemed guilty of a misdemeanour, punishable by fine or imprisonment, and shall, on conviction thereof, be sentenced to be imprisoned for any term not exceeding twelve months.

12. Every registrar of deaths in Ireland, on receiving notice of the death of any pharmaceutical chemist, or pharmaceutical student, apprentice, or assistant, shall forthwith transmit by post to the registrar under this Act a certificate, under his own hand, of such death, with the particulars of the time and place of death; and on receipt of such certificate, the said registrar under this Act shall erase the name of such deceased pharmaceutical chemist, or student, apprentice, or assistant, as the case may be, from the register, and shall transmit to the said registrar of deaths the cost of such certificate and transmission, and may charge the cost thereof as an expense of his office.

13. From and after the one thousand eight hundred and seventy-one, any person who, not being a duly registered pharmaceutical chemist, or duly qualified apothecary, shall keep an open shop or

wareroom for the retailing, dispensing, or compounding medical prescriptions, or who shall take, use, or exhibit the name or title of apothecary, pharmaceutical chemist, or pharmaceutist, or pharmacist, or dispensing chemist, in Ireland, or make use of any sign or title, implying that he is a qualified apothecary, or that he is registered as a pharmaceutical chemist under this Act, or any pharmaceutical chemist or apothecary who shall take or employ any person as student, apprentice, or assistant, without such person having obtained the proper certificates hereinbefore directed, or who shall compound any medicines of the British Pharmacopœia except according to the formularies of the said Pharmacopœia, each and every person so offending shall for every such offence be liable, on summary conviction before one or more justices of the peace, to pay a penalty of five pounds, and, when recovered, such penalties shall be applied to the purposes of this Act; but nothing in this Act contained shall prevent any person from being liable to any other penalty, damage, or punishment, to which he would have been subject if this Act had not passed.

14. Upon the decease of any pharmaceutical chemist or apothecary actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such pharmaceutical chemist or apothecary, to continue such business for a period not exceeding six months, and provided such business shall be *bonâ fide* conducted by a duly-qualified apothecary, or by a pharmaceutical chemist registered under this Act; provided always, that registration under this Act shall not entitle any person so registered to practise medicine or surgery, or any branch of medicine or surgery.

15. It shall, nevertheless, be lawful, anything to the contrary notwithstanding, for the examiners appointed under this Act to admit to examination any chemist and druggist who shall have been in business, as such, on his own account, for a period of not less than five years before the passing of this Act, and who shall, within six months after it has passed into law, make application in writing for examination to the registrar under this Act, accompanied with a certificate according to schedule (C) to this Act; and every such chemist and druggist who shall have satisfied the examiners as to his knowledge, skill and competency to carry on and conduct the business of a pharmaceutical chemist, shall receive the certificate of pharmacy from the said examiners, and shall be entitled to be placed on the register of pharmaceutical chemists of Ireland; and the person so certified shall pay the same fees as other pharmaceutical chemists under this Act; provided always, that in case of rejection, the rejected candidate may be re-examined after six months.

16. It is hereby further enacted, that a Pharmaceutical Society shall be instituted, to be named "The Pharmaceutical Society of Ireland;" and authority is hereby given for the formation of such Society; and in order to the formation of same it shall be lawful for every person who has been duly licensed and registered as a pharmaceutical chemist by this Act, and also for every duly-qualified apothecary, upon payment of an annual subscription of one guinea each to the Treasurer appointed under this Act, to become a member of said Society, and to have a voice and vote in all general meetings of the Society; and the Governor and Council of the Apothecaries' Hall of Dublin are hereby authorized and required, within one year after the passing of this Act, to convene a meeting of all members of the Society, to be held at their Hall in Dublin, by written or printed summonses, to be issued ten days previous to the day agreed upon for holding such meeting; and it shall be lawful for the members in assembly at such meetings to appoint a President, Vice-President, Council, and Secretary, for conducting the business of the Society, and like meetings of the Society shall be holden annually.

17. At all general meetings of the Society, it shall be lawful for the Society to make all such bye-laws and rules for the advancement of pharmacy and for the good government of the Society as the members present shall in their wisdom, and by a majority of votes determine; provided always, that said bye-laws and rules shall be consonant with, and not contrary to, any of the provisions of this Act; and it shall also be lawful for the Society at every such annual meeting, for the members present to elect from among themselves, by a majority of votes, six persons to be conjoint examiners with the examiners on the Pharmacy Court of the Apothecaries' Hall, to record their votes as to the merits of the several candidates who have undergone examination.

18. The parts hereinafter mentioned of the aforesaid Act of the "Thirty-first of George the Third, chapter thirty-four," shall be, and the same are hereby repealed; that is to say, so much of the tenth clause as relates to seven years' apprenticeship, the whole of the twenty-third clause, so much of the twenty-fourth clause as relates to fees for certificates, and the whole of the twenty-fifth and twenty-sixth clauses.

19. This Act may be cited as the Pharmacy Act, Ireland, 1870.

20. This Act shall apply to Ireland only.

SCHEDULE A.

Scale of Fees for Certificates.

Apprentices and Students	2 Guineas.
Assistants	3 Guineas.
Pharmaceutical Chemists	5 Guineas.
The Fee for Registration	5 Shillings.

SCHEDULE B.

Name.	Residence.	Date of Registration.
A. B.	Grafton Street, Dublin.	Jan. 10th, 1871.
C. D.	Patrick Street, Cork.	March 4th, 1871.
E. F.	Corn Market, Belfast.	June 15th, 1871.

SCHEDULE C.

Certificate to be signed by a *duly qualified medical practitioner* or *magistrate* respecting a person who was in business as a chemist and druggist in Ireland for five years on his own account.

To the Registrar appointed under the Pharmacy Act, Ireland, 1871.

I, residing at in the county of hereby certify that I am a duly qualified medical practitioner (or magistrate), and that to my knowledge residing at in the county of has been in business as a chemist and druggist on his own account for a period of not less than five years.

(Signed)

This day of 1871.

Punitaqui Quicksilver Mine.—According to *Nature*, an attempt is again being made to work the quicksilver mine of Punitaqui, in Ovalle department, Chile. It was worked for the crown in Spanish times, but the War of Independence and Indian incursions stopped it, as the latter did again in 1830.

Obstinate Hiccough.—Dr. Juaritz states, in the *Siglo Médico*, that a medical man, just convalescent from gastric fever, being seized with a very persistent and fatiguing hiccough, obtained relief, after many antispasmodics had been tried without effect, from an infusion of mustard, which he drank in mistake, thinking it an infusion of linseed.—*Lancet.*

CONDY'S FLUIDS.

The article on this subject in No. 12 of the Pharmaceutical Journal has called forth a reply from Mr. Condy which, besides being irrelevant to the point discussed, is much too long for insertion. As the article in question was taken by us from the pages of the *Practitioner*, and as Mr. Condy's objections to it have been answered in that journal so well as to leave nothing more to be said, we can merely remark in reprinting this reply, that we fully concur in the views expressed therein.—Ed. Ph. J.

"We have received a lengthy remonstrance from Mr. H. Bollman Condy on the subject of our report on the various disinfecting and purifying fluids sold in his name, and we must say that Mr. Condy's letter shows a strange want of appreciation of the motives with which we called attention to the composition and the prices of his goods. Our statement was substantially this :—The manganates and permanganates were long ago known to the chemist as powerful oxidizers, but Mr. Condy was the first person to see that this property might be turned to the purposes of disinfection, and to commence the manufacture of these agents on the large scale. We remonstrated with him, however, for maintaining so high a price for these fluids in proportion to the intrinsic cost of the active ingredients. We showed that *pure permanganate of potash*, representing the highest oxidizing, and therefore disinfecting power, possessed by any ingredient of Mr. Condy's fluids, can be purchased retail for *two shillings an ounce*, and that with this quantity it would be possible to convert 400 ounces of distilled water into a disinfecting fluid of equal power with the No. III. "Ozonized water;" 400 ounces of which, at Mr. Condy's price, would cost *about eight guineas*. That with the same two shillings' worth of permanganate of potash one could convert 50 ounces of distilled water into a disinfectant of equal strength with the "green" or the "red" solutions, while the same quantity of the latter, at Mr. Condy's prices, would cost respectively 1*s*. 9*d*. and 3*s*. 6*d*.; but that the red and green fluids, being made mainly with the cheap manganates and permanganates of soda, the cost of which is very greatly less than that of chemically pure permanganate of potash, there is in fact an extremely large margin of profit to the manufacturer. In restating the gist of our original remarks, we have now to add, that we might have greatly strengthened them; for we have discovered that, in Germany, the purest possible permanganate of potash can be procured for *threepence* an ounce, or *eight times cheaper than the specimen which formed the basis of our comparisons*.

"Now to these criticisms Mr. Condy makes three kinds of objections, which it is necessary to separate carefully from each other. In the first place, he maintains that a trader has a right to make what profits he can; to quote his own words, "It (our table of analysis) shows indeed that the selling price of Condy's fluid is somewhat (!) higher in two of the kinds than that of the equivalent quantity of its active ingredient. But surely this is nothing unusual; on the contrary, it is the rule in such cases, as every chemist and druggist must know. Is the Liquor Potassæ Permanganatis of the Pharmacopœia dispensed per ounce at the price of the eight grains of the permanganate contained therein? Far from this being so, sixpence per ounce is very commonly charged for it. Is it not the case that all other proprietary disinfecting preparations sell at rates greatly in excess of the value of the quantity of the active ingredients contained in them?" Really, this needs no comment. We had paid Mr. Condy the compliment of presuming that his views were not altogether those of a mere trader; the claims to scientific discovery which he put forward had led us to believe in his patriotic intention to bring a valuable sanitary discovery within the reach of the poor, and of public health authorities who might require to use it on a large scale. We beg his pardon if we have been mistaken.

"The second objection which Mr. Condy makes to our remarks is to the effect that even the oxidizing power of the manganates was not applied in laboratories before Hofmann (1856), and that Hofmann learned it from Condy. That is quite erroneous; our analyst informs us that this use of these salts was common *long before* 1856, to his personal knowledge.

"The third objection to our remarks is a charge of inaccuracy in our analysis of the "Ozonized water." In answer to this we have to remark that the examination was made by one of the first analysts of this country, and we are therefore disinclined to attach any very great importance to Mr. Condy's hints about some previously quite unknown permanganate. The only object in using a permanganate for toilet purposes, one would think, must be for its oxidizing power. It is a fact that for three farthings one could impregnate eight ounces of distilled water with $\frac{1}{4}$ per cent. of pure permanganate of potash (purchased in Germany); and it is also a fact that such a solution would be practically tasteless.

"After all, however, it is comparatively unimportant what the character or price of a toilet-water may be. But we must repeat the expression of our regret that Mr. Condy does not yet see his way to reducing the above-mentioned scale of profits on his green and red fluids, which, in order to make them useful as disinfectants in precisely the places where there is the most urgent need for this class of agents, ought certainly to be sold at a considerably cheaper rate. We would even venture to predict that, in the long-run, commercial success would also be found to attend upon the lower rather than the higher rates of profit; and we should be delighted to hear that Mr. Condy had benefited himself while doing a service to the public."

DRUG MARKET NOTES.

RESIN OF SCAMMONY.

We have had an opportunity of examining a recent importation of *resin of scammony*, said to have been manufactured in Smyrna from scammony root.

It had a resinous fracture, translucent edges, fragrant odour, and was nearly wholly soluble in ether; and, as far as could be ascertained, was entirely free from other resinous substances likely to be used as adulterants; its pale brown colour would almost lead one to suppose that animal charcoal had been used for its decolorization.

Analysis of 100 *Parts.*

Resin (soluble in ether dried at 212°)	91·4
Insoluble in ether	2·8
Water	5·8
	100·0

It was certainly quite equal to any we have seen produced by the British Pharmacopœia process, and far superior to some of the so-called *resin* of scammony of pharmacy, which is little better than the hardened alcoholic extract of the root (resin with glucose).

Former parcels of this resin, sent from Smyrna, are said to have found a ready sale in France; the excessive price, however, asked for this London import prevented a sale being effected.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 19, 1870.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes to be endorsed "Pharm. Journ."*

PHARMACY AND MEDICAL PRACTICE.

The controversy which has for some time been carried on in the correspondence columns of this Journal and of the *Lancet*, as to the existing relations of pharmacy to medical practice, has assumed a different and more important aspect since the scattered grievances of the profession have been gathered up and adopted by the editorial pen of our influential contemporary. As in actual warfare, the skirmish of outposts threatens to involve the opposing parties in a general engagement; but we will not willingly permit ourselves to be drifted into an impolitic and unnatural quarrel with our proper allies, the medical profession; therefore we do not hesitate to hang out the olive branch and confess that we have observed with regret, the acrimonious tendency of the correspondence *on both sides.* At the same time, we owe a duty to our members which we shall not shrink from fulfilling; and this duty constrains us to take serious exception to the tone of the leader in the *Lancet* of October 22nd, founded, as it appears to us, upon an entire misconception of the case it professes to deal with. We think the tone of that article must be deprecated by all who desire the maintenance of good relations between the profession of medicine and its handmaiden, the art of Pharmacy, amongst whom we fondly believe that the quantity and quality of both bodies are included.

While we are solicitous to show all proper respect to the exalted profession of medicine, and to extend that consideration to the *Lancet*, as being, in some sense, its recognized organ, our first duty is to uphold the independence of Pharmacy, and we protest, in terms admitting of no misinterpretation, that Pharmacy, while willing to concede respect and deference to the higher branch of the healing art, owes neither obligation, subjection, nor allegiance to its members. It acknowledges no authority by virtue of which they may assume to interfere with its internal affairs; it repudiates any suggestion of subservience inconsistent with its own absolute independence in that respect.

Having said this, our readers will understand that we do not propose to follow the *Lancet* into a futile discussion of the alleged overcharges of chemists. So far as the *Lancet* and the medical profession are concerned, Pharmaceutists are free to make their own arrangements with the public, without reference to such extrinsic considerations as the ability of their customers to pay a further sum to some other person for medical advice. It argues little wisdom to suppose that competition will not surely bring prices to a fair average, but it implies absolute folly to suppose that where competition fails, any other influence—be it the remonstrance of the *Lancet* or the pleadings of angels—will have a chance of success. Were it necessary to do so, we are prepared to prove, not by vague assertions, but by statistical facts, that the average dispensing charges of Pharmaceutists are fair and moderate; but for the purpose in hand it is sufficient to refer to our own pages during the last two or three years, to show that, in the opinion of those upon whose action any alteration must depend, the dispensing department of Pharmacy is less remunerative than ordinary retail trade.

Having, then, disposed of the accusation of overcharges, as not admissible in a discussion upon what the *Lancet* properly terms "the relation of pharmacy to medical practice," it is surprising how little remains that is tangible, and how obscure that little is. After a most earnest study of the article under consideration, we are obliged to confess that we do not know what is the exact nature of the *Lancet's* complaint, nor what is the precise character of the restrictions which it calls upon Pharmaceutists to observe. We suspect, indeed, that the *Lancet* could not venture to put forward any proposition in express terms which would not either outrage public opinion or dissatisfy its malcontent correspondents, whose statements, we take leave to observe, do not, according to our belief, represent the feelings of an enlightened profession. We fear that whatever would satisfy those correspondents would be so impracticable, that it would be no more effectual against public opinion than a cobweb against the charge of an infuriated bull. The *Lancet* tells us that the essential things are "two;" we venture to interpolate that the two essentials of any restrictions of pharmaceutical functions are that they should be rational and practicable. This being granted, we see no difficulty in candid advocates arriving at a fair understanding; and the time appears to have come when it is desirable that this vexed question, the source of many petty jealousies in time past, should be set at rest by frank and full discussion. The following passages will put the views of the *Lancet* fully before our readers; but we profess ourselves unable to interpret their combined signification until we are informed whether the stringent restrictions of the first two quotations are intended to be moderated in the spirit of the latter. We cannot derive this information from their position or context; this may, however, be more our fault than due to want of perspicuity in the writer.

We are told—

It is essential that drugs be taken only upon medical advice.

Druggists must be prepared to limit themselves to the work of preparing drugs prescribed by others.

Pharmacists and druggists must know that they are entirely unfitted for advising persons affected with serious ailment or disease.

A great deal of prescribing by chemists confessedly goes on. It is in constant evidence in our (*Lancet*) columns that chemists prescribe even in serious cases and sometimes visit.

If a literal interpretation be attached to the first two passages, we must say frankly that they will prove intolerable to the trade and to the public, and it would be useless for Pharmaceutists to pretend to accept them. But if we may understand them to be limited by what follows, to an improper assumption of responsibility in circumstances where the chemist must admit his want of qualification, we can only express our unconditional concurrence. But, then, we wonder why the article was ever written! It asserts a truism of which every reasonable person must be aware, one which Pharmacy unreservedly acknowledges; any infringement of it being a breach of pharmaceutical discipline, to be visited upon the offender, not upon the innocent commonwealth. We are not prepared to deny the statement that "a great deal of prescribing by chemists" goes on; but we believe that the prescribing here spoken of is, for the most part, justifiable and unavoidable. We are intuitively conscious that there are, in this country, millions of persons—graphically described by the *Lancet* as "people who believe in paying for all that they receive, and refuse to pauperize themseves"—who have no accessible means of obtaining relief for their minor ailments, other than recourse to the chemist.

We venture to assert that the organization of the medical profession is totally unequal to cope with this gigantic public necessity, and this conviction helps us to understand a dark saying of the *Lancet*, that the remedy for the grievance of prescribing chemists "*rests first with the medical profession in perfecting its own efficiency*." When it has done that,—when it has brought a better medical service within reach of these classes,—it will be time to call upon chemists to vacate the functions which they now discharge conscientiously, kindly, and to the best of their ability. This is the prescribing to which we confess, on the part of Pharmaceutists chiefly in the poorer districts, from which the complaints of interference usually proceed. We hope, for the honour of the medical profession, not to be reminded of the fable of the dog in the manger, by medical men restraining others from doing that which is beyond their physical ability to do themselves. Any present interference with existing custom would indeed be to place "artificial and injurious restrictions" in the way of the supply of drugs; nor are we sanguine enough to hope that it will ever be possible to supersede the present imperfect accommodation by a better one. Nothing is more common than for a person who has not a shilling to spend, to apply to a chemist for sixpence worth of cough drops, or some other simple remedy. Can human ingenuity devise a way by which any portion of this modest coin can be diverted to the payment of a medical fee without grievously taxing the patient, and placing an artificial restriction upon the use of drugs? It is open to the *Lancet* to say that the man would probably be better without the drops, but you cannot make him think so, and you have no right to control his freedom of choice.

We cannot close this article without expressing a hope that the discussion is now finally removed from the sphere of personalities, and that, if it be continued, it may be in an earnest and temperate spirit, becoming two departments of a profession devoted to the relief of human suffering. We have carefully abstained from introducing topics of an irritating nature, which will at once present themselves to our readers as trenchant weapons of debate, for we are not actuated by desire to heap confusion upon an enemy, but are sincerely anxious to appease a friend, and deem it better to restrain the exuberance of our own members than provoke asperities from those with whom it is our policy and our desire to cultivate relations of mutual respect. Therefore we exhort Pharmaceutists, as they value that independence for which we shall ever strenuously contend, to avoid its abuse, and to show by their conduct that they know how to exercise their privileges in a spirit of good feeling and good faith.

PHARMACY IN IRELAND.

A few weeks ago we notified the probability of an attempt being made to assimilate the law as to the practice of pharmacy in Ireland with the Pharmacy Act of Great Britain. The need for such a measure is, we are sure, sufficiently well appreciated by all who have any cognizance of the case, to ensure their attentive consideration of the steps taken with the object of giving an independent existence to the art of pharmacy in the Sister Isle, and of creating there a body of competent pharmacists. We mentioned at the same time that the Apothecaries' Hall at Dublin would probably bring forward a Bill with this object, and we are now enabled to place before our readers the draft of this Bill.* It proposes to amend the Act for regulating the profession of an apothecary, and that a Pharmaceutical Society of Ireland should be instituted, since it is deemed expedient to enable

* See page 405.

the Governor and Company of the Apothecaries' Hall of Dublin to grant licences to persons—other than duly qualified apothecaries—to assume the name of pharmaceutical chemists, and to keep open shop for the "retailing, dispensing, or compounding of prescriptions of duly qualified medical practitioners, and also to grant certificates enabling persons to be engaged or employed as students, apprentices, or assistants, respectively."

A copy of this draft appears to have been sent round to the chemists and druggists in Ireland by the Governor and Company of the Apothecaries' Hall, with a request that they should give it careful consideration and communicate to that body their opinions, together with any suggestion they might wish to offer.

The chemists and druggists of Ireland seem, however, to have regarded the action of the Apothecaries' Company as being too paternal, and not calculated to promote the interests of Pharmacy, for at a meeting called shortly afterwards by the Association of Chemists and Druggists of Ireland to discuss this Draft Pharmacy Bill, which was largely attended, a decided objection was expressed to the Apothecaries' Company taking the position of a governing body in regard to Pharmacy. At the meeting held in Dublin on the 11th inst., a resolution was passed "that the Association of Chemists and Druggists of Ireland, whilst admitting the necessity of a Pharmaceutical Society for Ireland, decline to place themselves under the control of the Apothecaries' Hall of Ireland."

In this state of the matter it would probably be somewhat premature to offer any remarks, since the Draft Bill will most likely attract the attention of our Council. We would, however, suggest that the Chemists and Druggists of Ireland, who are most of all concerned in the proposed measure, should individually express their views regarding it in this Journal; and doubtless there are many members of the trade here who will also feel disposed to do the same in the general interest of Pharmacy.

The recent accession of Mr. Dakin to the position of Lord Mayor affords an opportunity for reminding our readers of his connection with the drug trade as the head of a firm of wholesale druggists in St. Catherine Cree Lane, Leadenhall Street. Mr. Dakin was born in 1808, and was educated at the Grammar School, Knutsford, and afterwards at the University College, London. He was one of the original promoters of mechanics' institutes in the Metropolis, and with Dr. Birkbeck assisted in the foundation of the London Mechanics' Institution, Chancery Lane. He has been twenty-eight years connected with the Corporation, and served the office of sheriff in 1864. He is also a magistrate for Middlesex. We may add that Mr. Dakin was for many years proprietor of a retail establishment in King William Street, City, and it is with regret we do not find his name on the Register of Pharmaceutical Chemists; but we hope during the period he occupies his exalted position we shall find him identifying himself with his professional brethren. We are glad to state that he has consented to be one of the stewards of the Chemists' Ball, to be held on the 25th January next.

The friends of Mr. Richard Reynolds will be glad to learn that we hear he is progressing favourably, and that it is hoped he will not experience any serious ill-effects from the accident he met with last week, though it may be necessary that he should, for some time, abstain from business occupations.

Proceedings of the Pharmaceutical Society.

EXAMINATION IN LONDON.

November 16th, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden, Ince, and Southall.

Thirty candidates presented themselves for examination, seven Major and twenty-three Minor; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

*Haydon, William Frederick.... Blandford.
*Metcalfe, Edmund Henry...... Richmond.
*Mason, Philip Henry .... Norwich.
Young, Joseph .... Leicester.
Ingham, John .... Tooting.
Chase, Thomas .... London.

MINOR (as Chemists and Druggists).

*Makinson, Thomas .... Hampstead.
*Bannard, Henry .... London.
*Wright, Thomas .... Leicester.
*Collishaw, John .... Nottingham.
*Shenstone, William Ashwell .. Colchester.
*Wills, Joseph .... Carlisle.
*Noad, Joseph .... Coleford.
Fairbairn, Robert Waller...... York.
Hillier, Henry .... Newport, Mon.
Binns, John George .... Manchester.
Riches, William James........ North Walsham.
Milton, Thomas, jun. .... Henley-on-Thames
West, William .... Leeds.
Mumford, Francis Charles .... Gloucester.
Mountain, Robert .... Harrogate.
Glazier, Walter Henry........ London.
Robertson, George............ London.
Stubbs, Tyson............ Rye.
Sanderson, Thomas .... Birmingham.

The above are arranged in order of merit.

FIRST OR PRELIMINARY EXAMINATION.

Certificates presented by the under-mentioned were accepted in lieu of this Examination:—

Stefford, Charles .... Sydenham.

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* Passed with honours.

Provincial Transactions.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting was held on November 3rd, in the Council Room of the Manchester Chemists and Druggists' Association, attended by a large number of the chemists' assistants and apprentices of this city.

It was proposed by Mr. W. Metcalfe that an Association should be formed, to be called the "Manchester Chemists' Assistants' Association," to have for its object the mutual assistance of its members in all matters relating to business, and as a help to those preparing for the examinations of the Pharmaceutical Society. After being supported by several gentlemen, the meeting was adjourned until that day week, when a code of rules was to be submitted for revision.

The second meeting was held on November 10th, and was more largely attended than the previous one.

Mr. Metcalfe having been unanimously voted to the chair, the rules were submitted, and after a very lengthy discussion were revised and passed, after which the following officers and committee were elected for the ensuing year:—*President:* Mr. W. Metcalfe. *Vice-President:* Mr. Yeats. *Honorary Secretary and Treasurer:* Mr. B. H. Cowgill. *Committee:* Mr. Cooper, Mr. Gill, Mr. Mercer, Mr. Midgley, Mr. Raworth, Mr. Spencer.

The benefits to be derived from the Association having been very earnestly discussed, the meeting was dissolved.

It is proposed to read a paper at each weekly meeting upon some subject of a practical nature, after which discussion will be invited upon the same.

This Association will work in unison with the "Manchester Chemists and Druggists' Association," one of the rules making it compulsory for each member to be also an Associate of that Society. The session will extend from the 1st October to the 31st April in each year.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Monthly Meeting of the above Society was held on Monday evening, November 7th, at the Society's rooms in Fawcett Street; Mr. R. Robinson in the chair.

Mr. Sharp read a paper on Sulphur, tracing its history from the earliest record, describing the various sources from whence it is obtained, its commercial uses and chemical characters.

Owing to the unavoidable absence of Mr. Harrison, his resolution, concerning the exemption of Chemists and Druggists from juries was postponed to a future meeting.

At the close, a vote of thanks was passed to Mr. Sharp. The next meeting was announced to be held on December 5, when Mr. Cockburn will read a paper on Cinchonas.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Wednesday, September 14th.

(*Continued from page* 395.)

A better Excipient for the Official Pill-masses, and for exhibiting Substances generally in a Pilular Form.

by W. Martindale, F.C.S.,

Dispenser and Teacher of Pharmacy to the University College Hospital.

The making of pills and pill-masses is such an everyday performance of the pharmacist, and, being one which requires a little dexterous manipulation, "the rapid and skilful preparation of them from all the numerous substances of which they are composed has been justly considered to demand his highest qualification as a practical dispenser."*

The active medicaments which prescribers wish to administer in a pilular form vary very much in their physical and chemical characters; most frequently the bulk of the ingredients are powders, or substances capable of being reduced to the state of powder. In such, and indeed in all cases, the choice of a suitable excipient is of the greatest importance, both as regards the therapeutic action of the ingredients, and likewise its being adapted for the purpose of combining with them to form a firm plastic mass, which can be readily rolled out and divided into pills capable of retaining their globular form. To quote Dr. Redwood, the excipient should therefore be such as "will not be incompatible with any of the ingredients of the pills; will modify as little as possible their action, either by causing them to become hard, or in any other way; and will not unnecessarily or inconveniently increase their size."† For the sake of uniformity in dispensing, to the last condition there should, I think, be this marginal allowance, as small doses and active principles are now so much in vogue, that unless specially required, the active ingredients and excipient together in each pill should not, in any case, weigh less than one grain, that is if, say, a quarter of a grain of hydrochlorate of morphia were ordered to be made into a pill, three-quarters of a grain of excipient should be used.

The excipients for pill-mass which are required to be kept as such—not moulded into pills at the time of making; the official pill-masses, for example—should, if possible, keep them in a plastic condition, or, at least, in such a state that they could readily be made to assume this condition again by beating up in a mortar, without any further addition of excipient being needed, as this would lessen the quantity of active ingredients contained in a given quantity of the mass.

I will briefly examine how far the excipients in general use fulfil the required conditions.

Confection of Hips.—This is directed to form sulphate of quinine into a mass in the official pilula quiniæ, and it is much used as an excipient for powdered crystallizable salts, and metallic powders generally,—but it is unstable in its chemical character,—the sugar it contains becomes partially converted into grape sugar, and this being less soluble soon crystallizes. It therefore requires on some occasions much more of this excipient necessary for the purpose of forming a plastic mass, than at others. Unless very recently prepared, it is impossible to combine one part of it with three of sulphate of quinine into a mass which can be rolled and divided into pills, as is directed in the official pilula quiniæ.

Confection of Roses.—This confection, although it varies a little in consistency, is not liable to undergo the granular crystallization to which confection of hips is so prone. It is directed to be used as an excipient in eight out of the twenty official pill-masses, and with the exception of pilula aloes cum ferro, it makes masses which retain their plastic condition tolerably well. Its fault is, the quantity needed materially increases the bulk of the mass, for example, five-twelfths of its weight of the official mass of pilula aloes cum myrrha is composed of the excipient. Its bulkiness generally precludes its use as an extemporaneous excipient.

Treacle.—This is the excipient in five of the officinal pill-masses. It does not find favour with the dispenser, because it is so peculiarly viscid that when a little is taken from the bulk, there is apt to be formed a thread-like, attenuated attachment, which is not conducive to cleanliness. It is better adapted for making pill-masses in quantity than for extemporaneous dispensing, but it does not generally keep them in a plastic condition. About one-third of its weight of the compound rhubarb pill-mass is composed of this excipient, and even that

* Cooley's 'Encyclopædia of Practical Receipts.'
† Mohr and Redwood's 'Practical Pharmacy.'

quantity does not make a mass which, when kept, can readily be made to assume its plastic condition again. *Simple syrup* is sometimes used for vegetable powders, but it likewise forms a somewhat bulky excipient.

Hard Soap.—This is one of the excipients in seven of the official pill-masses. A little powdered soap is useful in reconciling an essential oil to an obstinate pill-mass, but on account of its chemical action its use should, as much as possible, be avoided. *Mucilage* is often used for extemporaneous work, but pills made up with it are apt to become very hard and insoluble,—in fact, with some fine metallic powders it forms a good cement. *Bread crumb* and *manna* are used for such substances as calomel. Those containing bread crumb, it is well known, get very hard when kept.

But where a somewhat fluid excipient is needed, the one which either alone or with some admixture, finds most favour, is *glycerine*. If there be any extractive matter among the active ingredients, such as there is in vegetable powders generally, it forms of it a ready solvent, and of the whole a plastic mass. But there is a great danger of adding too much of this excipient, in which case it oozes out to the surface of the pills after a time, and gives them an unsightly moist appearance. To avoid this, it is generally mixed with one-third of its bulk of water, or better still, of rectified spirit. A little in this diluted state, kept in one of Chalk's drop bottles, flows more readily than the pure, and, if used in slight excess, the more volatile fluid evaporates, there is thus less likelihood of the surface of the pills becoming moist, but a mass of this kind does not keep sufficiently plastic. On account of its peculiar properties, for therapeutic reasons glycerine forms about the best general excipient for pills. In the pure state it is not liable to change in itself,—its taste is agreeable, and excepting in a few instances with metallic salts, it produces no reaction more than mere solution of them, with non-metallic salts the same, but of these it is a much more general solvent,—and its solvent and preservative action on vegetable substances generally is such, that a class of preparations of this kind has been suggested as substitutes for tinctures. When the vegetable ingredients of a pill are bulky, powdered rhubarb for example, less is required of it than of any other excipient. It has, too, the advantage of keeping them in a readily soluble condition, and by reason of its non-volatility, if a mass containing it should not remain plastic, it easily becomes so, without further addition of excipient, when "worked" in a mortar. But the disadvantage of the pills made with it becoming moist on their surface is a great drawback to its being generally used, I have, therefore, endeavoured to get some absorbent for this excess of moisture.

We used to have at the University College Hospital a general excipient for pills, which was then called *bread mass*. This was composed of a mixture of wheat flour, powdered soap, and treacle beaten together; it did duty for confection of roses, confection of hips and most other excipients; and generally did this well, as regards rapidity with which it would form substances into a suitable plastic condition for rolling into pills. But when required for such salts as calomel, corrosive sublimate, nitrate of silver, the sulphates of iron and copper, etc., these were decidedly incompatible with the soap it contained. Nevertheless, when I interdicted its use, I found we had need of something resembling it, as most frequently we get the excipient left to the option of the dispenser, and no other excipient in ordinary use was found so generally applicable as it has been. To obtain this desideratum, I first tried a mixture of *flour* and *glycerine*, but this I was surprised to find possessed little or no adhesiveness, very unlike the mixture of *flour* and *water*, of which the gluten contained in the flour forms such an adhesive paste; yet I found the flour was an excellent absorbent of the glycerine. I next tried various proportions of glycerine and flour heated together, to form a jelly resembling the glycerine of starch, but of firmer consistence. By stirring constantly and heating together until a temperature of about 240° F. is reached, five parts of glycerine, by weight, and one part of flour, a firm adhesive paste is formed, which I call *Glycerine Mass*. As an excipient for vegetable powders it answers well, and for other substances on which it can exert a partially solvent action, it is eminently useful. Among these are such salts as valerianate of zinc, 4 grains with 1 of the glycerine mass forms a good pill. Quinine, 3 parts with 1 of the mass,—B. P. strength,—works well. Compound powder of ipecacuanha, 5 grains with $\frac{3}{4}$ of a grain of the mass makes a small pill. Oxide of zinc, too, 4 grains with 1 makes a good mass. But for most mineral and insoluble powders it is too moist, and will not form with them a firm mass; some additional absorbent is necessary, and for this purpose I found nothing better than the one I have before mentioned—flour; equal parts of the glycerine mass and flour forms a tolerably firm, solid, adhesive paste, somewhat resembling dough, but it is not so elastic; this I *now* call *Bread Mass*. It possesses great capacity for the absorption of insoluble powders, such, for example, as calomel (3 grains with $1\frac{1}{2}$ grain of this mass makes a good pill), nitrate and carbonate of bismuth, arsenic, etc. Of reduced iron, three parts with two of it forms a good mass, in which the iron is not liable to oxidation. Carbolic acid, too, of which it is a good solvent, is readily made into a pill with the bread mass,—a little additional flour being necessary for this substance. Then again, substances that are given in minute doses, as the salts of morphia, resin of podophyllum and other active principles, to partially dilute their action, or where an excipient is needed to slightly increase the bulk of a pill, it is well adapted for use. And among the official pill-masses, an equal quantity of it can with great advantage be used to supplant confection of roses in all these, with the exception of pilula aloes cum ferro—for which the glycerine mass is needed, and pilula ferri carbonatis, this too, requires the glycerine mass, with which it mixes well, but after a time the pills have a tendency to become moist. Mercurial pill I have not tried with it. The same quantity of this bread-mass will replace the treacle in pilula scillæ composita. Equal parts of it and powdered soap in place of powdered soap alone (if this might be permitted), form a much better mass than the official one of pilula saponis composita. This pill-mass, made strictly according to the British Pharmacopœia, soon becomes set into a condition resembling a piece of soap, in which state much beating is necessary to make it again plastic.

Of the glycerine mass to be added to the Pharmacopœia quantities of

Pil. Cambogiæ Comp. (*vice* Syrup) 1 oz. makes a good mass.

,, Colocynth. Comp. (*vice* Water) 3 dr. makes a good mass, and does not get so hard.

,, Hydrarg. Subchlor. Comp. (*vice* Castor Oil) $1\frac{1}{2}$ oz. makes a good mass, but becomes slightly moist.

,, Ipecac. c. Scillâ (*vice* Treacle), 1 oz. makes a good mass, which does not crumble.

,, Rhei Comp. (*vice* 4 oz. Treacle) 2 oz. makes a good mass, and keeps tolerably plastic.

Among the other official pill-mass which I have not tried with these excipients are pilula colocynthidis et hyoscyami and pilula conii composita—these I find do not generally require any excipient—and pilula ferri iodidi, the starch contained in the flour with that would not form an elegant preparation.

Nitrate of silver is generally recommended in works on Materia Medica to be made into a pill, with bread crumb, but this contains common salt, with which it is incompatible. I recommend the following formula, which is a modification of the bread mass:—

℞ Nitrate of silver, 6 grains.
Distilled water, 6 minims.

Dissolve and add—

Glycerine mass, 12 grains.
Flour . . . 24 grains.

Mix to form a mass which may be divided into two-grain pills, each containing a quarter of a grain of nitrate of silver. The mass rolls out well. Keep them from exposure to the air and light.

For *perchloride of mercury* pills :—

℞

Perchloride of mercury, 6 grains.
Distilled water . . 48 minims.

Heat in a test-tube till dissolved, and add it to

Glycerine mass, 48 grains.
Flour . . . 96 grains.

Mix well and divide into ninety-six two-grain pills, each of which will contain a sixteenth of a grain of perchloride of mercury.

In recommending these excipients, *glycerine mass* and *bread mass*, for general use, I consider them therapeutically the best, but pharmaceutically they are not always so, as glycerine has some affinity for moisture, and pills containing it suffer if exposed to this in any way; a damp situation or a very humid state of the atmosphere, will sometimes spoil the appearance of a batch of them. But in the use of these masses as excipients for the extemporaneous dispensing of pills, the utmost cleanliness may be observed, as they are not viscid or clammy like treacle, syrup or pure glycerine. They likewise keep pills more plastic than the other excipients used, and they are more neutral in their chemical action than those in general use.

Substances like nitrate of silver and perchloride of mercury may form different combinations with the albuminoid principles contained in the flour, but in such state they will probably be quite as readily assimilated, and have a similar medicinal action, as physiologists affirm that most metallic substances enter into the blood as albuminates. I have had some fear lest the gluten contained in the flour might favour some decomposition similar to fermentation, but such, from nearly two years' use of them, I have never yet seen take place, the glycerine seems to check anything of the kind. The crude gluten obtained in the moist condition from flour, I find is nearly entirely soluble in glycerine, the solution does not appear to undergo any change when kept.

Taking these points into consideration, and the fact that the masses I have suggested form economical excipients, and for hospitals, where some quantity of these are needed and form an item in their expenditure, I think they may meet with some favour.

A mixture of glycerine and tragacanth is often used, and produces very similar results to those I have obtained from the glycerine mass. I have not had much experience with such a mixture, but I find it makes a more elastic paste, which is often a disadvantage, as it causes the pills to have a certain amount of springiness, and renders them difficult to form perfectly globular.

Glycerine of starch, or a mixture of glycerine of starch and flour, do not form such adhesive pastes as those I have used.

Phosphorus is sometimes ordered in a pilular form; and to exhibit it in that condition, oil of theobroma is a good excipient. One per cent. of phosphorus may be readily dissolved in this by the following process:—Having melted the oil contained in a wide-mouthed bottle placed in a water-bath, add the phosphorus, and partially closing the mouth of the bottle, heat till this too melts, and the temperature of the mixture becomes about 180° F. Then cork it tightly, and with a little brisk agitation the phosphorus will dissolve almost immediately. Allow the fluid to cool and solidify; and having in this condition divided it into suitable lots for rolling, beat each in a mortar to render it plastic before applying it to the machine, and work off quickly. A three-grain pill will contain $\frac{1}{33}$ of a grain of phosphorus. They may be coated with a solution of sandarach in absolute alcohol in the following manner:—place the pills in a covered pot, and pour upon them a few drops of the solution, agitate well, and turn them out upon a slab, separate them from each other and allow them to dry in the air. This gives them a tolerably impervious coating. The process of coating may be repeated if necessary.

For *dried sulphate of iron*, of which a large quantity is sometimes ordered in a pill, I find syrup is the best excipient. No form of glycerine seems to answer well for this substance. The water in the syrup for a time appears to have more affinity for the sugar than it has to form water of crystallization for the sulphate, and a little syrup therefore keeps the mass plastic for a sufficient length of time, that it can easily be rolled into pills. Five grains of this substance can thus be made into a small pill.

In conclusion, you are well aware the task of pill-making is not always an easy one, as frequently substances are ordered together in a pill-mass which have great repulsion for each other—the dexterous reconciling of them brings into play much of the art of pharmacy.

Note on Hydrargyrum c. Creta.

BY M. J. ELLWOOD.

A sample of hyd. c. creta sent out by a London firm came recently under my notice. Its black colour and exceedingly strong metallic taste at once attracted my attention, and aroused my curiosity as to its manufacture. I remember a paper being read at the Birmingham meeting, describing a new method for preparing blue pill, the mercury being obtained in a state of fine division by precipitation from mercuric chloride with stannous chloride. I have no doubt this grey powder was prepared by a similar process as regards the mercury. To ascertain the truth of my supposition, I prepared a small quantity of precipitated mercury and mixed it in its moist state with the proper proportion of chalk, and dried with a gentle heat. The resulting powder resembled the original in colour and general appearance, but had not quite so strong a taste, probably owing to the precipitated mercury prepared by myself having been very carefully washed from any traces of tin.

I send a sample of that prepared by myself, but regret to say that the original sample was destroyed; that sent, however, will give you a pretty accurate idea of it.

Since writing the above, I have referred to the discussion attendant on the reading of Mr. Benger's paper on "Blue Pill," and find that Mr. Brady remarked that the process alluded to *might* possibly answer for preparing grey powder. Some manufacturer evidently took the hint at the time, for the bottle from which the sample was taken was marked as received into stock in 1866, just one year after the Birmingham meeting.

Microscopic Examination of Extracts made from Officinal Tinctures.

BY M. J. ELLWOOD.

Messrs. Deane and Brady's interesting papers on "Microscopic Analysis applied to Pharmacy," induced me to repeat their experiments on opium preparations, and afterwards to extend my researches to several of the officinal tinctures. I prepared slides of ten tinctures according to the plan recommended by Messrs. Deane and Brady; after a lapse of from two to eighteen months, and in two cases more than two years, crystals have appeared in—

Tincture of Belladonna.
,, Conium.
,, Digitalis.
Purified ,, Opium (B. and D.'s form).

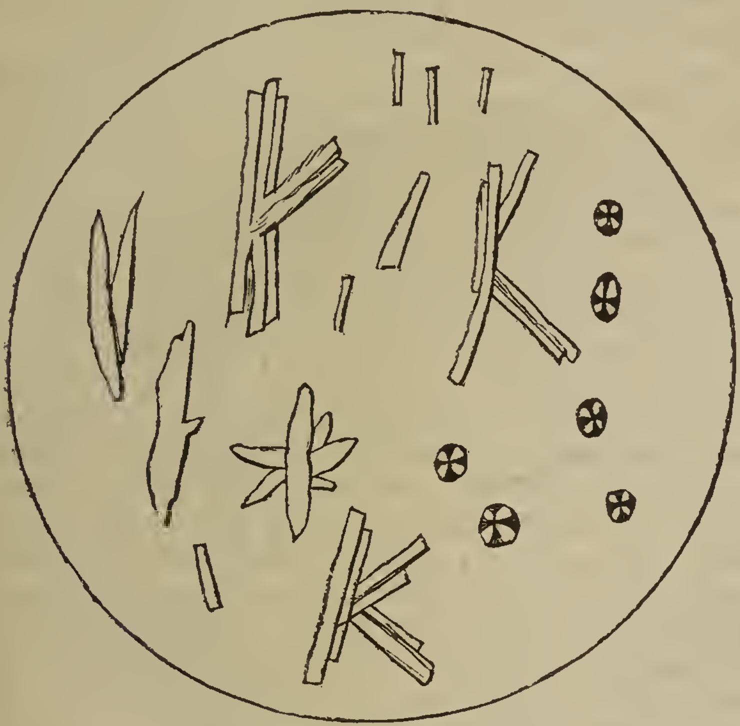
I may also state that a very gradual growth of crystals has continued up to the present time, now nearly three years since the experiments were made.

No appearance of crystals are observable however, in

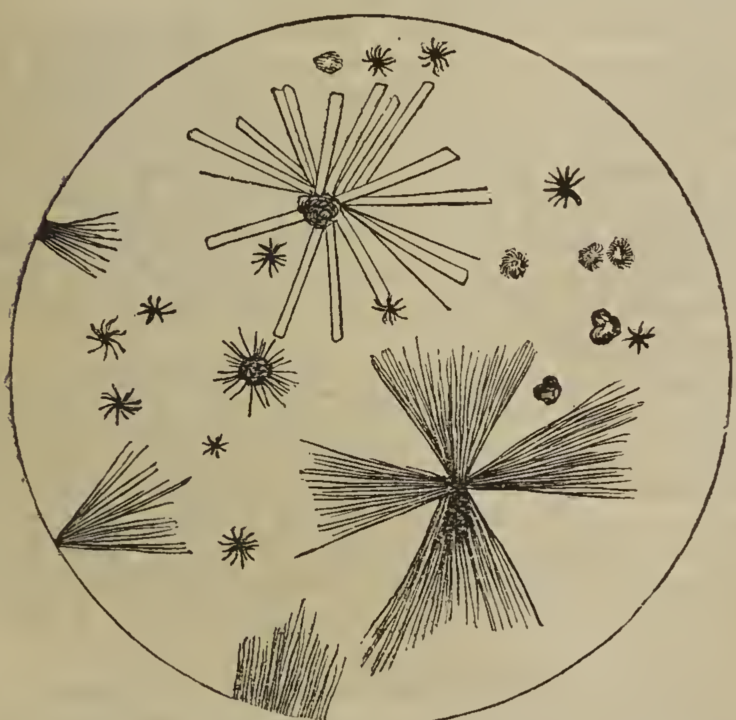
	Tincture of	Cascarilla.
	,,	Buchu.
Simple	,,	Cinchona.
	,,	Nux Vomica.
Simple	,,	Rhubarb.

except in the case of Tincture of Pellitory, which is as yet doubtful.

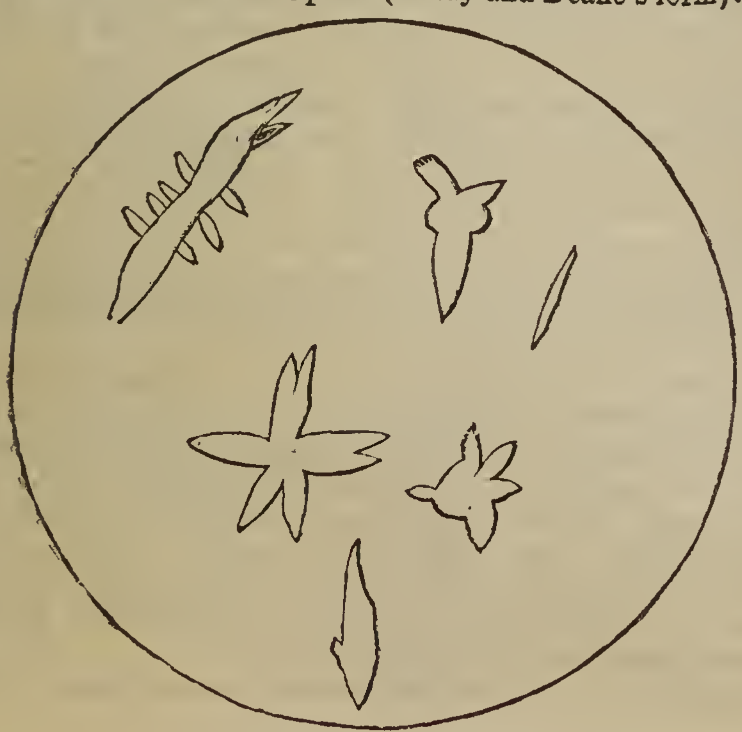
I am not prepared to say what the crystals are, but the forms of some of them incline me to suspect oxalate of lime.



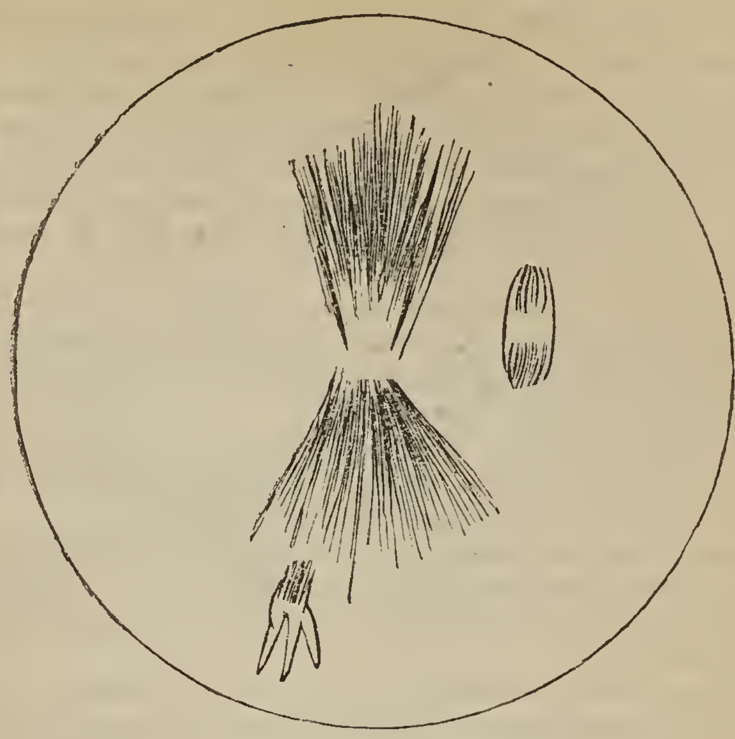
Tincture of Belladonna.



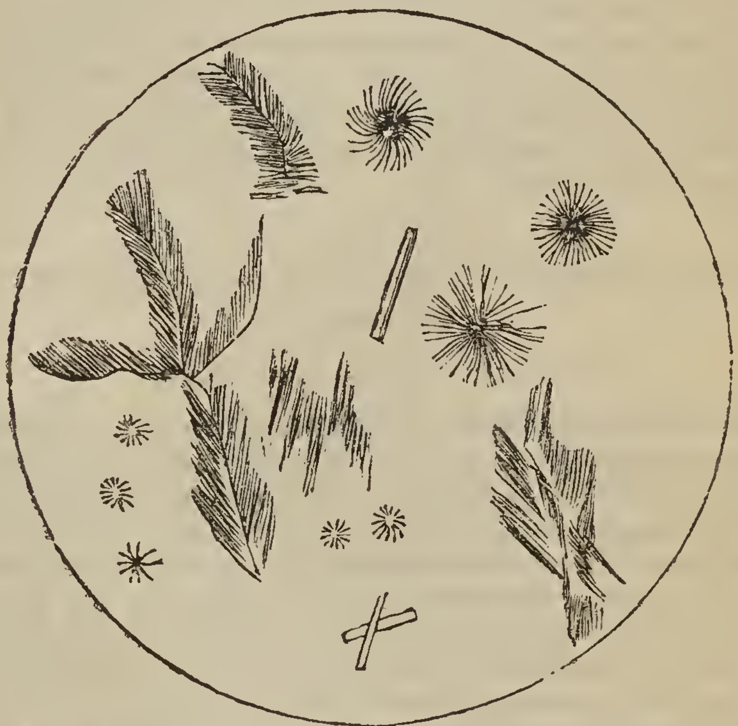
Purified Tincture of Opium (Brady and Deane's form).



Tincture of Digitalis.



Tincture of Conium.



Aqueous Solution of Opium, after maceration in Ether.

One of my experiments with opium proved extremely interesting. I washed powdered opium with ether, and then made an aqueous extract of the residual powder, which soon produced on my slide magnificent feather-like crystals, but without any appearance of the prismatic crystals of narcotine, forming an excellent polariscope object.

Laboratory Notes on Turmeric.

BY JAMES COOKE.

Although but a short time has passed since my becoming a member of the British Pharmaceutical Conference, yet the conviction that members of a Society should all be contributors to the common welfare and prosperity, inclines me to send a few lines, even should they be only suggestive, through Joseph H. Richardson.

It is possible that few of the Pharmaceutical Conference have prepared or seen Cheiranthine, a crystalline product of the wallflower petals. A small portion prepared by me some years ago will be sent with this, which may interest some not yet acquainted with it.

My principal object here is, however, not cheiranthine.

As brevity on such occasions as the present is important, a short communication must suffice.

Several vegetable products, but little examined as yet, have in years past and to the present time yielded interesting results.

Indications of new substances with basic properties in plants, British and foreign, of various Natural Orders, may readily be obtained by curious inquirers. Vegetable *acids* seem to receive less exact inquiry.

In recent experiments with turmeric, I have discovered a basic substance, which, separated by ammonia from its combinations with sulphuric and nitric acids, presents a finely granular semicrystalline precipitate, readily soluble in hydrochloric acid. This combination crystallizes in long prismatic crystals with oblique terminations. It is colourless, and much disposed to become opaque.

The nitrate crystallizes in very short prisms with a tendency to unite in pairs which, much magnified ($\frac{2}{3}$ object-glass), resembled the disposition of the two lobes of some anthers in the Gramineæ.

The sulphate also presents groups of long crystals, grouped in a stellate manner, opaque by prolonged drying in warm air. This salt is also colourless.

There were indications of another base, resembling in some points that existing in calumba root. I say *that*, but believing that there are at least two, mean the principal one.

The colouring matter is quite another product.

I have some intention of undertaking for another year, if health and leisure allow it, the examination of the salts of lithia, which I find noted in the desiderata.

Let me conclude by wishing success to the Conference, an organization which may prove very serviceable by carefully and earnestly encouraging working bees, and by putting in their way what is worth having in forthcoming Year-Books.

The Chemical Constitution of Sulphurated Potash.

BY JOHN WATTS, D.SC. LOND.

The following paper contains an account of some experiments upon which I have been engaged during the last few months, in order to ascertain more directly the exact chemical composition of sulphurated potash.

Different chemical works give different and, apparently at first sight, discrepant results respecting the reaction which ensues when a mixture of potassic carbonate and sulphur is submitted to fusion. By some, especially by those of high authority, it is asserted that the reaction takes place according to the following equation,

$$4K_2CO_3 + 5S_2 = \underbrace{K_2SO_4}_{\text{Sulphate.}} + \underbrace{3K_2S_3}_{\text{Sulphide.}} + 4CO_2,$$

potassic sulphide and potassic sulphate being produced, while carbonic anhydride is evolved. By others it is stated that potassic hyposulphite is one of the products of the reaction, and that either potassic sulphate is not produced at all, or the equation proceeds in two stages, thus,

$$3K_2CO_3 + 4S_2 = \underbrace{K_2S_2O_3}_{\text{Hyposulphite.}} + 2K_2S_3 + 3CO_2.$$

$$\underbrace{4K_2S_2O_3}_{\text{Hyposulphite.}} = \underbrace{3K_2SO_4}_{\text{Sulphate.}} + \underbrace{K_2S_5}_{\text{Sulphide.}}$$

the hyposulphite being resolved into sulphate and sulphide when the temperature at which the fusion is conducted approaches ignition.

A few qualitative analyses of some samples of "sulphurated potash," prepared with varying molecular proportions of materials, immediately decided in favour of the latter equations; the presence of potassic hyposulphite in considerable proportion was readily established, while potassic sulphate was detected only in very small quantity, and in one sample disappeared altogether. It is well, perhaps, to mention that there is much difficulty in preparing a sample entirely free from sulphate, since if the heat employed be somewhat too high or too long continued, a proportion of sulphate is immediately formed at the expense of the hyposulphite present.

Being now enabled to calculate the percentage composition, I proceeded to the quantitative analysis of several commercial samples, to see how closely their percentage might agree with that which had been deduced from theoretical considerations. The samples were procured from some of the best wholesale houses, and fairly represent the article as met with in commerce. The analysis resolves itself into the quantitative separation of a mixture of potassic sulphide, hyposulphite and sulphate, but the probable presence of potassic sulphite and potassic carbonate must not be ignored, since the former may be derived from incipient oxidation, and the latter may result from imperfect decomposition.

There are two methods of effecting the separation of sulphides from hyposulphites and the higher oxacids of sulphur:—1. By adding to a solution of the salt in question a strongly ammoniacal solution of argentic nitrate, the sulphur existing as potassic sulphide is alone precipitated as argentic sulphide, while the remaining silver salts are retained in solution by the excess of ammonia present; the argentic sulphide is collected and washed, and the sulphur estimated either by oxidation or by reduction in a current of hydrogen. To another portion of the salt, solution of argentic nitrate is again added, omitting the previous admixture with ammonia,—argentic sulphide is precipitated as before, while at the same time the hyposulphite is resolved into a mixture of argentic sulphide and argentic sulphate; when the decomposition is complete, excess of ammonia is added and the sulphide collected and estimated as before. The amount of sulphur corresponding to one-half of the hyposulphite present is then calculated, by deducting, from the total amount of sulphur found, the weight of sulphur as obtained in the first operation.

2. By *Werther's* method. Recently precipitated cadmic carbonate is added in excess to the solution to be analysed; double decomposition ensues, potassic carbonate formed, and cadmic sulphide precipitated; this latter is washed, oxidized with fuming nitric acid, and the sulphuric acid estimated as baric sulphate. The hyposulphite present is unaffected by cadmic carbonate, and consequently will be found undiminished in the filtrate, where it can be readily estimated by the usual decinormal iodine solution.

Werther's method is preferable to the first process for several reasons. The cadmic sulphide washes with great rapidity, since, like argentic chloride, it has a tendency to coagulate into small clots; moreover, it has no inclination to oxidize by exposure to the air. The substitution of a volumetric estimation in the case of the hyposulphite is likewise more expeditious, and in accuracy perhaps excels the gravimetric method. I give the actual analyses more in detail.

Estimation of the Sulphide.—About 1·5 gramme were dissolved in water, and excess of cadmic carbonate added. The reaction takes place almost instantaneously, without heat, and if the carbonate has been used in sufficient quantity, the cadmic sulphide separates perfectly. The sulphide was then collected on a filter, washed with hot distilled water and partially dried; then transferred to a small flask and oxidized with fuming nitric acid, the boiling was continued until the unoxidized sulphur had acquired a pure yellow colour, when the whole being allowed to cool, the sulphur was separated and weighed. The sulphuric acid formed was then estimated with baric chloride in the usual way.

Estimation of the Hyposulphite.—A volume of carbonic acid water was added to the filtrate from the cadmic sulphide precipitate, to convert the carbonates present into acid carbonates; decinormal iodine solution was then run in, till the blue colour appeared as indicated by starch paste. The value of the iodine solution being known as corresponding to crystallized sodic hyposulphite, the equivalent quantity of anhydrous potassic hyposulphite was readily calculated.

Estimation of the Sulphite.—But the estimation of the hyposulphite requires a correction, lest any of the iodine employed should have been consumed by sulphurous acid. The direct estimation of the SO_2 is based upon the fact that while iodine oxidizes hyposulphurous acid into tetrathionic acid, it converts sulphurous acid directly into sulphuric acid; therefore, by estimating the sulphuric acid so formed, we are enabled to calculate with facility the amount of sulphurous acid from which it was derived. Further, the amount of sulphurous acid being known, the iodine required for its complete oxidation is known also; the weight of this latter being deducted from the total weight of iodine employed, the remainder represents correctly the proportion of iodine consumed by the hyposulphite.

In no single instance was any potassic sulphite detected in solution of sulphurated potash; the numbers obtained in the analyses after oxidation with iodine, always exactly corresponded with those yielded by the estimation of the sulphuric acid originally present.

Estimation of the Sulphate.—About seven grammes were dissolved in a small quantity of water, and the solution completely decomposed by addition of dilute hydrochloric acid. A gentle heat was applied to volatilize sulphuretted hydrogen and sulphurous gases. After filtering off and washing the precipitated sulphur, the sulphuric acid in the filtrate was estimated with baric chloride.

Estimation of the Carbonate.—6·5 grammes were dissolved in water, and directly precipitated with excess of baric chloride. The precipitate consisted of baric carbonate, sulphate and a small quantity of the sparingly-soluble hyposulphite; this was washed with distilled water, transferred to the usual carbonic anhydride apparatus, a little potassic chromate added to effect the oxidation of any hyposulphite which might chance to be present, and the carbonic anhydride determined by loss in the usual way.

Estimation of the Total Potassium.—Two grammes of the salt having been weighed in a porcelain crucible, the latter was very slowly and carefully brought to a red heat so as to decompose the hyposulphite, and at the same time convert nearly the whole of the sulphide present into sulphate. After allowing the crucible to cool slightly, a few drops of nitric acid were added, and the whole evaporated to dryness. The subsequent addition of a drop of strong sulphuric acid ensured the conversion of the whole of the salt into sulphate, and the excess of sulphuric acid being expelled by a red heat with the assistance of ammonic carbonate, the potassium was weighed in the form of sulphate.

I give the theoretical percentage composition of sulphurated potash, supposing it to be formed according to the equation—

$$3\,K_2CO_3 + 4\,S_2 = K_2S_2O_3 + 2\,K_2S_3 + 3\,CO_2,$$

but the Pharmacopœia orders a slight excess of potassic carbonate:—

Sulphur	35·68	} in combination.
Potassium . . .	29·00	
Pot. Hyposulph. .	35·32	
	100·00	

The following are the results of the analysis of four distinct samples, A, B, C, D:—

A.	Sulphur	36·13	} potassic sulphide.
	Potassium . . .	25·28	
	Pot. Hyposulphite	38·32	
	,, Sulphate . .	0·87	
		100·60	
	Excess . . .	·60	
		100·00	

B.	Sulphur	25·45	}
	Potassium . . .	17·21	
	Pot. Hyposulphite	21·56	
	,, Sulphate . .	3·38	
	,, Carbonate . .	32·72	
		100·32	
	Excess . . .	·32	
		100·00	

C.	Sulphur	28·17	}
	Potassium . . .	22·65	
	Pot. Hyposulphite .	38·00	
	,, Sulphate . .	2·34	
	,, Carbonate . .	7·50	
	Ferrous Sulphide .	·92	
		99·58	
	Loss	·42	
		100·00	

D.	Sulphur	28·32	}
	Potassium . . .	20·20	
	Pot. Hyposulphite .	31·82	
	,, Sulphate . .	4·32	
	,, Carbonate . .	14·09	
	Ferrous Sulphide .	1·00	
		99·75	
	Loss	·25	
		100·00	

Sample "A" has been very carefully prepared; it contains no carbonate, only a trace of sulphate, and the full percentage of sulphide. All the other samples contain carbonate, especially "B," which latter is a very indifferent preparation, containing not less than 32 per cent. of undecomposed carbonate, with a proportional decrease in the amount of sulphide.

The ratio of potassium to sulphur in potassic trisulphide is 78 of potassium to 96 of sulphur. In the foregoing analyses the ratio, as might be expected, is not quite so uniform, at the same time it is sufficiently so to show that the potassium exists in the salt principally as trisulphide admixed with a certain varying proportion of tetra- or pentasulphide.

Ratio in A	78 to 111
,, B	78 to 115
,, C	78 to 97
,, D	78 to 109

In sample "B," owing to the deficiency of potassium in combination with the sulphur, due to imperfect preparation, the ratio more nearly approaches tetrasulphide than trisulphide of potassium.

I append the analysis of one sample in which complete decomposition has taken place, owing to its having been kept for a period of about nine months in a bottle with an imperfectly-fitting stopper. As will be seen, the potassic sulphide has entirely disappeared, having been oxidized principally to hyposulphite and sulphate with separation of sulphur.

E.	Potassic sulphate	18·06
	,, hyposulphite . .	51·60
	Free sulphur	15·42
	Ferrous sulphide	1·73
	Potassic carbonate . . .	3·10
	Moisture	8·89
		98·81
	Loss	1·19
		100·00

Ferrous sulphide must be noticed as an impurity in several samples. In every case the ferrous sulphide formed a superficial coating upon one side only of the fragments; it is obvious that the salt when in fusion has been poured out upon an iron plate instead of upon a stone slab, and hence has contracted this objectionable contamination. When sulphurated potash is of yellow colour, or breaks with a yellow or orange fracture instead of a deep brown, it is almost certain that it contains a considerable amount of undecomposd carbonate. Specimen "B" shows this orange colour exceedingly well, and I have noticed it in several samples which I purposely prepared at a very low temperature. In carefully-prepared samples the colour varies very slightly indeed, being always of a rich mahogany-brown tint, commonly described as liver-coloured. The colour may be seen in specimens A 1, B 1, which have been preserved from oxidation by enclosing them as soon as cold in bottles previously filled with coal-gas.

There is no difficulty in preparing sulphurated potash upon the small scale; indeed, since more care can be taken in its preparation, it is likely to prove a superior article. A quarter to half a pound of a mixture of 20 parts of *dry* potassic carbonate and $12\frac{1}{2}$ parts of sulphur are placed in a Florence flask, and carefully heated by a Bunsen burner. The mouth of the flask is to be stopped with a plug of cotton-wool; as soon as the contents commence to liquefy the flask must be gently agitated once or twice, and when effervescence has ceased, and the mixture perfectly fluid, the gas is withdrawn, and the whole allowed to cool for two hours. The flask is then broken, and the contents immediately transferred to a well-stoppered bottle. If the salt has not been permitted to become quite cold, it is not sufficiently brittle to be broken into pieces; and further, it then adheres so firmly to the glass that it is very difficult subsequently to remove it.

I have said that the reaction which occurs in preparing sulphurated potash is such that potassic sulphide and hyposulphite are produced, but that if the heat be increased the hyposulphite splits into pentasulphide and sulphate. It might be supposed at first sight that the percentage of sulphide would be increased by employing an elevated temperature, and possibly, if closed vessels were always used in its preparation, this might to some extent be the case; but it is impossible so to prepare it on the large scale; and when atmospheric oxygen obtains access to the mixture the decomposition of the hyposulphite proceeds differently, oxygen being absorbed, while sulphurous anhydride is given off.

$$2K_2S_2O_3 + 2O_3 = 2K_2SO_4 + 2SO_2.$$

Potassic sulphide also undergoes combustion when unduly heated, producing the same compounds as result from hyposulphite, consequently sulphurated potash containing a large amount of sulphate can only be regarded as a faulty preparation. It appears, however, that the error more generally lies in the opposite direction.

With respect to the test given in the Pharmacopœia, that three-fourths of its weight should be soluble in alcohol of 84 per cent., it appears that few samples will come up to this standard; nevertheless, if the salt contain only half its weight of potassic sulphide, it may fairly be considered as a good preparation.

The Fluid of Pitcher-Plants.—Mr. G. B. Buckton records in *Nature*, No. 54, for November 10th, some experiments on this subject. Difference of opinion has been expressed as to the nature and use of the liquid found in the so-called pitchers of various plants, such as *Nepenthes*, *Sarracenia*, and certain orchidaceæ. It is generally supposed to be pure rain-water stored up for the use of the plant. In the artificial circumstances under which tropical plants are grown in this country, it is difficult to distinguish this fluid from the water used in watering. Mr. Buckton has, however, collected the liquid from two flowers of *Coryanthes*, a species of Orchidaceæ, which had just opened, to the extent of about two centimetres. He found it clear and somewhat glutinous in consistence, possessing a high refractive power, and a specific gravity of 1·062. Its odour was pleasant but faint, becoming more marked by a gentle heat; although the taste was not acrid, the mawkish flavour would render it quite unpotable. It was neutral to test-papers, became milky by concentration in the water-bath, and finally yielded a transparent gum insoluble in alcohol. Oxalates produced no precipitate of lime, but basic lead acetate gave a curdy reaction. Hot concentrated sulphuric acid blackened it. 100 parts of the liquid contained—

98·51 water and volatile oils.
1·49 non-volatile residue.

No further analysis is given.

Parliamentary and Law Proceedings.

Southwark Police Court, *November 4th.*

Before Mr. Partridge.

Elizabeth Morvin, described as a needlewoman, was charged on remand with attempting to commit suicide by swallowing a quantity of aquafortis, which had been supplied to her child by a chemist in the Waterloo Road. A police constable said that he was called in to a house in Duke Street, where he found the prisoner suffering great agony. Being told she had swallowed aquafortis, he took her to a surgeon, and thence to the hospital, where the stomach pump was used, and she eventually recovered. On inquiry he found that she had sent her daughter to purchase two-pennyworth of aquafortis. The child told him that she went to several chemists, and at last one of them supplied her with the poison, which she gave to her mother, who drank it off. The prisoner said that having had a dispute with the father of her child, she had been drinking to excess, and did not know what she was about. Mr. Partridge told her that she had had a narrow escape, which he hoped would act as a caution to her for the future, and after suitably admonishing her, ordered her to be given up to her landlady.

BOOKS RECEIVED.

A Manual of Botany: including the Structure, Functions, Classification, Properties and Uses of Plants. By Robert Bentley, F.L.S., M.R.C.S.E. Second Edition. London: John Churchill and Sons, New Burlington Street. 1870. From the Publishers.

Dublin Quarterly Journal of Medical Science. November, 1870. Dublin: Fannin and Co., Grafton Street. From the Publishers.

On the Fulgurator: a New Apparatus for producing Electric Sparks of very great length. 1870. From the Author.

Elementary Chemistry. By the Rev. H. Martyn Hart, M.A. London: Cassell, Petter and Galpin. 1870. From the Publishers.

The Natural History of Commerce, with a Copious List of Commercial Terms and their Synonyms in Various Languages. By John Yeats, LL.D. London: Cassell, Petter and Galpin. 1870. From the Publishers.

The following journals have been received:—The 'British Medical Journal,' Nov. 12; the 'Medical Times and Gazette,' Nov. 12; the 'Lancet,' Nov. 12; 'Nature,' Nov. 10; the 'Chemical News,' Nov. 11; 'Journal of the Society of Arts,' Nov. 10; 'Gardeners' Chronicle,' Nov. 12; the 'Grocer,' Nov. 12; the 'English Mechanic,' Nov. 11; the 'Produce Markets Review,' Nov. 12; the 'Philadelphia Medical and Surgical Reporter,' nos. 706–710; 'New York Druggists' Circular' for October.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[5.]—LABELS FOR HERBARIA.—I have a book, on the title-page of which is the following:—"Price 3*s.* Botanical Labels for a Herbarium, edited by a Corresponding Member of the Botanical Society, London. Faversham: Printed by W. Ratcliffe, Court St." I am afraid it was published some years ago, and may now be out of print.—WILLIAM D. GIBB, *Winchester.*

[24.]—TANNIN IN GALLS.—Prof. Fehling, PHARM. JOURN., Vol. XIII., p. 420, gives—

Gall nuts, 30 to 33 per cent.
Aleppo galls, 60 to 66 per cent.
Chinese „ 70 per cent.

I should think Japanese contain about the same as Chinese. If *F. C.* is a *chemist*, he might easily estimate the proportion of tannin in Mecca galls. I believe they contain very little. —H. E. G.

[28.]—SYMPATHETIC INK.—A solution of sulphate of ammonia makes a good invisible writing fluid, blackening by heat from the acid attacking the paper; dilute acid. sulph. also, but it is corrosive and acts on the pen. A little s. v. r. in the solution quickens its absorption.—WM. BARTHOLOMEW, *Egham.*

[35.]—ROSE TOOTH-POWDER.—A most beautiful pink colour may be obtained by adding *strong* liquid ammonia to carmine (the carmine must be mixed with a small quantity of chalk before adding the ammonia).—F. ALLEN, *Holywell.*

[36.]—EAU DE COLOGNE.—(La première qualité.)

Spirit (from grape), 60 o. p., 6 gallons
Otto Neroli Petale ℥iij
„ „ Bigarade ℥j
„ „ Rosemary ℥ij
„ „ Orange Peel ℥v
„ „ Citron Peel ℥v
„ „ Bergamot Peel ℥ij.

Winchester Terrace, Sunderland. GEORGE MYLES.

F. A. H. recommends an essential oil manufactured especially for the purpose.

[37.]—EAU DE PORTUGAL.

Rectified Spirit (60 O. P.) 1 gallon
Oil of Orange Peel ℥viij
Oil of Citron ℥ij
Oil of Bergamot ℥j
Otto of Rose ℨ¼.

(Piesse's 'Art of Perfumery.')—F. A. H.

SYRUPUS FERRI QUINIÆ ET STRYCHNIÆ PHOSPHATUM.—In the last two numbers of the PHARMACEUTICAL JOURNAL, under "Notes and Queries," I have seen communications respecting "Syrupus Ferri Quiniæ et Strychniæ Phosphatum (Easton's)," and in one number a formula is given as stated by Squire.

On reading this I notice that it differs from one I have, both in proportions of ingredients and manipulation, although, as regards the ingredients, the difference is not a great one.

The formula I have I copied from a portion of a work lent by Dr. Aitken (and I believe written by him) to a former employer of mine, in which he mentions the syrup as having been recommended by Mr. Easton to him for trial in his practice. As the formula may be useful to chemists, I give it as there stated.

℞. Ferri Sulph. ℨv
*Sodæ Phosph. ℨvj (vel ℥j)
Quiniæ Sulph. gr. excij
Acid. Sulph. Dil. q. s.
Aq. Ammoniæ Fort. q. s.
Strychniæ gr. vj
Acid. Phosphor. Dil. ℥xiv
Sacchar. Alb. ℥xiv.

* ℨvj is the quantity generally used.

Dissolve ferri sul. in 1 oz. of boiling water and sodæ phosph. in 2 oz. boiling water; mix and wash the precipitate till the washings are tasteless. With q. s. of diluted sulphuric acid dissolve the quinine in 2 oz. of water, precipitate the quinine with liq. ammon. fort. and wash carefully. Dissolve the phosphate of iron and quinine thus obtained, and also the strychnine in the diluted phosphoric acid, add the sugar and dissolve without heat; product should measure 24 oz.—HENRY NEWMAN, *London.*

[39.]—LIQUOR COCCI.—"*Percontator*" would be glad of a good practical formula for cochineal colouring, which will keep, remain bright and not deposit.

[40.]—CHLORAL HYDRATE.—"*Hypnotic*" would like a form for syr. chloral hyd. gr. x to dr. in which the taste of chloral is *masked* on dilution.

[41.]—BATH POWDER.—*A. B. C.* (Norwich) wishes to be informed what the powder or preparation is which is used in baths after a patient has been suffering from scarlet fever.

[42.]—CHILBLAINS.—"*Lugoney*" and *C. Bennett* wish for a formula for a good chilblain liniment.

[43.]—VEGETABLE ALKALOIDS.—"*A Bookworm*" asks for a reference to practical works on the preparation of vegetable alkaloids (non-officinal).

[44.]—PERFUMES.—"*Chemicus*" would feel obliged if any gentleman would favour him with a recipe for a cheap lasting perfume.

[45.]—WATER TEST.—*J. G. M.* will be glad if any one could inform him of a simple way of testing water for organic impurity, especially such as is derived from sewage.

[46.]—WEATHER GLASS.—Can any correspondent give the recipe for making a liquid for indicating changes of the weather by the rise or fall of a sediment in the same?—C. E. M., *Bury.*

[47.]—SMALLPOCK MARKS.—*A. H. C.* (Cirencester) wishes to know if there is any application for temporarily effacing smallpock marks, and if so, what it is or where it can be obtained.

[48.]—CRYSTALLINE POMADE.—*A. H. C.* is in want of a good recipe for making crystalline pomade.

[49.]—EAU DE MILLEFLEURS.—*G. S.* will be greatly obliged if "*Utile*" (Boston), who supplied a recipe for jockey club bouquet in the Number for February, 1870, would now be kind enough to give one for eau de millefleurs.

[50.]—SYRUPUS CHLORAL (HYDRAT.).—*G. M. T* (Penzance) wishes to know of a good formula for syrupus chloral (hydrat.).

[51.]—BRILLIANTINE.—*G. M. T.* wishes for a recipe for making brilliantine.

[52.]—COFFIN'S COMPOSITION POWDER.—Can any of your correspondents furnish me with a formula for Dr. Coffin's composition powder?—A. B.

[53.]—DISPENSING.—Will any of your correspondents inform me how to dispense the following mixture, so as to make it CLEAR and of a sherry colour?—

℞. Beberiæ Sulphatis ℈i
Ferri Citratis ℈i
Syrupi Aurantii,
Tincturæ Calumbæ, ana ℨi
Infus. Calumbæ ad ℥iv.
Fiat mistura. C. F., *Winchester.*

[54.].—PLATES OF MEDICINAL PLANTS.—*B. M. S.* (Boston) wishes to be informed where he can obtain plates of the medicinal plants, especially of the indigenous, and the probable cost.

UNANSWERED QUERIES.

In the event of any query remaining unanswered four weeks, the number and subject will be inserted for two weeks in the list of unanswered queries.

4. Isinglass for Brewers' Finings, p. 317.
6. Essence of Coffee, p. 338.
10. Wholesale Druggists' Assistants' Society, p. 338.
11. Australia.

Correspondence.

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

Pharmaceutical Education.

Sir,—To a certain extent I agree with Mr. Bremridge and Mr. Allkins on the subject of Pharmaceutical Education, but my idea is that, in the main, practical experience is far better than theoretical knowledge; the former is carried out in daily pursuits, the latter is, in many instances, laid on the shelf when once the "necessary examination" is over. At any rate, I think Mr. Allkins would not advocate the placing of a youth under the tuition of an M. P. S. such as "Assistant"* speaks of, more particularly if he is like some of our brother chemists, who, for the consideration of fifty or sixty pounds premium, undertake (as per indenture) to board, lodge, teach, and instruct, by the best means possible, the art of a Chemist and Druggist (dispense a 6-oz. mixture for 8*d*., retail sp. æther. nitr. 2*d*. oz., make their proof spirit for tinctures, half and half, mix alum with cream of tartar, prepare tr. opii with ext. papaveris, etc.).

It is very right to assist apprentices in some theoretical parts of the business, but pharmacists ought to adopt no other methods than the authorized formulæ, and they should scorn the idea of any kind of sophistication. If such were the case, depend upon it the cutting system would gradually wear out.

Brighton, Nov. 15*th*, 1870. "Proof Spirit, P.B."

Preliminary Examination.—Prize Scheme.

Sir,—In the hope of giving some encouragement to candidates for the Preliminary Examinations of the Pharmaceutical Society, allow me to propose the following scheme:—

That candidates for these examinations shall pay, in addition to the ordinary fee of two guineas, one or two shillings extra (at discretion); that this sum shall be appropriated at the end of the year to the purchasing of medals, books, etc., and that these shall be given as rewards of merit to the three or four best competitors at each examination during the year. This scheme may be either optional or compulsory. If, however, the latter plan could be adopted the affair would be made much easier, for by the former plan the prizes would be available only to those who subscribed the extra fee. This might cause confusion. Suppose, then, that a shilling was fixed as the extra fee, and that this was compulsory. I think that so trifling an amount would not cause many objections, but, on the contrary, the plan would meet with much approbation.

An Encourager.

Dispensing Charges.

Sir,—Several correspondents having addressed you in last week's Journal upon the above subject, allow me to give an instance which came under my own observation, showing how inexpedient it is to be so influenced by mere statements, as not to make a fair and proper remunerative charge for dispensing. About a week since I dispensed the following prescription:—

℞. Quinæ Sulph. ℈i
Acid. Sulph. Dil. ʒi
Tinct. Cardam. Co. ℥ss
Tinct. Hyoscyami ʒiij
Mist. Camphoræ ad ℥viij.
M. Take two tablespoonfuls three times a day.

An empty bottle without label was brought by the servant, and from some little observation made I thought a very moderate charge was requisite. Accordingly 1*s*. 9*d*. was charged. To my surprise, in the evening of the same day the mixture was returned, with a statement that Mr. G. could not think of keeping the medicine at such a preposterous price. The gentleman subsequently called himself, and asked why I should charge 1*s*. 9*d*. for dispensing a prescription which had been prepared several times by Corbyn in the Poultry for 1*s*. 3*d*., and once in my own neighbourhood for the same amount (in the latter case it afterwards transpired that the charge was made on account of it *being stated* Corbyn's had charged that sum). I said I could not think of altering my price, which was exceedingly moderate, and that I did not think it possible Corbyn's should make such a charge for it. Wishing fully to investigate the matter, and see how far such a statement was correct, the following morning I took a copy of the prescription to Messrs. Corbyn and Co. (Poultry), giving them an account of what had taken place. Their reply at once was, if the prescription has been dispensed by them their charge for it was 1*s*. 10*d*. Comment, therefore, is needless. Upon my return I wrote, informing the gentleman of the result of my visit to Messrs. Corbyn's. I need scarcely say I have heard nothing since.

E. Applegate.

Upper Holloway Road, November 14*th*, 1870.

Pharmaceutical Apparatus.

Sir,—The very excellent suggestion made by Mr. Faulkner in your last issue will, I trust, meet with the approval of the Council of the Society. I crave permission to add that I consider it would be most politic at the present juncture, while so much is being written about "Pharmaceutical Education in the Provinces," if the Council were to invite competition for the best complete set of laboratory fittings suited to the requirements of an ordinary retail business. I think a prize of sufficient value to excite an active competition, together, perhaps, with the privilege of the successful competitor being permitted to erect a model at the house of the Society, where it might be seen by any person connected with pharmacy, would yield us what has been long a desideratum; while at the same time, by means of this small encouragement, some of the difficulties which beset a successful prosecution of pharmacy in the provinces would be obviated.

If you consider the above remarks of sufficient interest, I should feel obliged by their insertion in the next number.

Cliff Town, Southend, Nov. 14*th*. Jas. Wheeler.

Obscure Prescriptions.

Dear Sir,—Some of your readers may feel interested in reading another specimen of Mr. Watson Bradshaw's *peculiar* style of prescribing, commented upon by *F. J. B.* last week, and I therefore enclose a formula, which was brought to me some time since to dispense:—

℞. Pulv. Cinerei gr. ss
Ext. Sedativ. gr. iv
M. ft. pil. h. s.
℞. Liq. Alkalin. ʒiss
Extr. Nigr. gr. ss
Ess. M. Pip. ♏xx
Infusi Subamaræ ad ℥viij
Tinct. Subamaræ, ʒvj
M. capiat partem sextam ter in dies.

Aprilis 19*mo die*, 1869. Watson Bradshaw.
43, Welbeck Street, Cavendish Square, W.

"*Socius*" and "*Chemicus*," who do not send their names and addresses, are referred to the Registrar.

Pharmacy in Ireland.—"*Mercurius*" wishes to be informed by "*A Registered Chemist and Druggist*" (London) the route by which he can get from Dublin to London in "four or six hours," as he has to travel that journey frequently.

"*Inquirer*" (Hampstead).—Your letter has been handed to the Secretary.

"*A Century of Old Books*."—*W. J.*, writing concerning Mr. Ince's paper, expresses his opinion that a very interesting book might be produced on the changes which have taken place in pharmaceutical preparations and remedial compounds. The London 'Dispensatory,' published by the Colleges of Surgeons and Physicians, which was the authorized Pharmacopœia at the time when some of the books mentioned in Mr. Ince's paper were issued, contains some absurdities quite as foolish as any to be found in Wesley's 'Primitive Physick.'

"*Patent*."—No.

R. A. R. (Brompton).—No.

F. J. Barrett.—We cannot understand your question.

Communications, Letters, etc., have been received from Mr. J. E. Howard (London), Mr. W. J. Bramwell (Brighton), Mr. A. Barfoot (Leicester), Dr. L. V. Newton (New York), Mr. C. Umney (London), Mr. R. Giles (Clifton), Mr. J. F. Baldock (Rochester), Dr. Kidd, Mr. C. R. C. Tichborne (Dublin), Mr. Watson Bradshaw, Mr. A. W. Bennett, Mr. Barker, Messrs. Churchill and Sons, Mr. Cann (Greenwich), Mr. B. H. Cowgill (Manchester), Mr. Allchin, Mr. Malcham (Sheffield), Mr. Roberts (Leeds), Magnesia (Richmond), Dispenser, A Bookworm, Iodi (Sudbury), W. M. (Carlisle), Deprecator.

* See No. 20, p. 398.

INFUSIONS.

BY A. ALLCHIN.

The infusions used in pharmacy have perhaps given rise to more discussion than any other class of preparations contained in the British Pharmacopœia. But though much has been said and written on the subject, nothing very satisfactory has as yet resulted, and the position of this matter, as it now stands, is hardly creditable to pharmacists as a professional body.

The questions respecting the use of concentrated preparations are still undecided, and, what is worse, there is no uniformity of practice. We have on the one hand pharmacists of acknowledged ability refusing to recognize these preparations, which we know to be in daily use in many establishments; while on the other hand, they are recommended as well as used by men of great experience, whose opinion is entitled to respect, inasmuch as they conscientiously believe that in using concentrated preparations, they are faithfully fulfilling the intentions of the prescriber as well as their duty towards patients.

Anything that would tend to do away with these differences, both in practice and opinion, that have so long perplexed pharmacists, should be gladly welcomed by them, and for this reason alone the paper recently brought before the Pharmaceutical Society by Mr. Barnes merits the careful consideration of all concerned with dispensing. The author may fairly be considered to merit the thanks of the trade, not only for having directed attention to the subject, but also for having taken a step in the right direction, and, in a great measure, disposed of the difficulties by which it has been surrounded.

Before proceeding to speak more particularly of this paper, it appears desirable to give a brief *résumé* of what had previously been published on the subject of infusions.

In the first volume of the Pharmaceutical Journal the preparation of infusions and decoctions was brought forward by Mr. Bell, and he drew attention to the fact that a paper had been written on the subject by Mr. Alsop, of Chelsea, in the year 1836, but owing to the want at that period of any channel for the publication of such papers in this country, it had been sent to Philadelphia and published in the *American Journal of Pharmacy*. An abstract of this paper was published in the Pharmaceutical Journal,* and the hope was expressed that such communications might in future be furnished to the Society instead of travelling from London to England by way of Philadelphia. Among the points discussed in this paper, the best form of pot or jar for infusions was first referred to, and the one recommended was that in which the ingredients are allowed to rest on a perforated plate, placed nearly at the top of the vessel, rather more boiling water being added than would be sufficient to cover the ingredients, so as to allow for absorption. This plan was adopted, in order that, during the maceration, the liquid in contact with the infused material might become charged with soluble matter, and then sink through the perforations while the unsaturated portion of water took its place, the action continuing until the whole of the soluble matter became extracted.

The most convenient mode of preserving infusions was then considered; the one recommended—the most valuable that has ever been devised—was at once adopted. It is still used by many of the most enlightened of our brethren, and has been at all times strongly recommended by the Professor of Chemistry and Pharmacy to our Society as well as many other distinguished men.

The operation is briefly as follows:—When the maceration has continued the prescribed time, the infusion should be strained and transferred to stoppered bottles of convenient size, the bottles being filled to the top of the necks, and if the liquid be sufficiently hot, the stopper is to be inserted and made to displace its own bulk of liquid. In cases where the infusion becomes cold before the expiration of the time which it is directed to stand, it is necessary to place the filled bottles in a water-bath and again heat them before the stoppers are inserted. Ordinary bottles with corks can, with a little judicious management, be made to answer the purpose either by perforating the cork and closing the aperture as the liquid cools with sealing-wax, or by using the cork entire. In the latter case, the cork having been previously fitted to the neck, has only to be placed on the top of the filled bottle, and gradually pressed down on the receding fluid as it cools.

When the discussion of this subject was first commenced, in August, 1841, the names of two gentlemen were mentioned who were at that time making concentrated preparations said to possess the requisite properties of the drugs in a convenient form, but the plan adopted for making them not being generally known, their use was limited and it was considered difficult to form any decided opinion as to the real value of these preparations. In 1845, Mr. Thomas Greenish communicated a paper on infusions,* confining his observations principally to the temperature at which infusion of calumba ought to be prepared. He admitted that when made with cold water, it possessed the requisite strength and aroma, and had also the advantage of being bright, but he showed that owing to the presence of albumen, it was more liable to decomposition than an infusion made at a temperature of 212°. On this occasion Dr. Redwood referred to the plan of Mr. Alsop for the preservation of infusions, and stated that he had found infusions preserved in that way were perfectly good at the end of twelve months when put into six- or eight-ounce bottles and the mouths closed with tinfoil while quite hot.

In 1847, the sixth edition of the Prussian Pharmacopœia appeared, and in order to guard against the too rapid cooling of infusions when made in small quantities, the vessels in which they were made were ordered to be exposed to the influence of steam for five minutes.

In 1853, at a meeting of the Edinburgh Chemists' Association, on March 16th, Mr. James Gardner read a paper on the watery infusions of the Pharmacopœia, and on concentrated infusions,† in which he stated that his attention had for many years been directed to concentrated infusions, and gave a detailed account of a method for their preparation. According to this, we were directed to take of the materials ordered by the College as much as would make any number of pints or gallons of an ordinary infusion, then to exhaust them with hot or cold water, and having strained carefully, to evaporate the liquid to a ninth part of the measure ordered by the College; lastly, to add an eighth part of rectified spirit,

* New Series, Vol. II. p. 89.

* Pharm. Journ. 1st ser. v. 307. † *Ibid.* xii. 485.

and when the concentrated liquor had become clear, it was to be decanted off or filtered. One ounce of such a concentrated infusion, added to seven of distilled water, was said to form a mixture equal in strength, and possessing all the medicinal properties of an ordinary infusion. This mixture was also said to be superior to an ordinary infusion in appearance. Mr. Gardner concluded his remarks by stating that several similar preparations were in use, but that so far as he had an opportunity of judging, they did not adequately represent the strength required by the College. This appears to have been the first formula published for making concentrated infusions, and it is obviously open to objection, inasmuch as it would be impossible to evaporate such infusions as those of "orange," "chamomile," "cascarilla," etc. etc. without impairing their qualities. This communication was supplemented by another in 1855, in which a proposition was made to overcome these objections by first digesting these bodies in the spirit that was ultimately to be used for their preservation.

In 1854, Mr. Frederick Curtis presented to the Pharmaceutical Society several specimens of concentrated preparations,* which were placed on the table at a meeting on December 6th, and gave rise to one of the most animated discussions that ever took place on this subject. Mr. Curtis, when pressed, made known the mode by which he made his preparations.

At two subsequent meetings the discussion was continued.

In 1855, Dr. Edwards read a paper on concentrated infusions and decoctions at the Liverpool Chemists' Association,† in which he stated that concentrated infusions were at that time much in use, especially among medical men who dispensed their own medicines, and he believed their experience would go far to justify their use.

About the same time, Messrs. Barton made known a formula for preparing Inf. Calumbæ Concent.‡

Mr. Jacob Bell furnished several formulæ for concentrated preparations. On these occasions much valuable information was elicited, but no advance appears to have been made in regard to the real question at issue, viz. whether, if "fresh" infusions be ordered, it is justifiable to substitute "concentrated" preparations.

Mr. Southall communicated a short note at a meeting of the Society,§ in which he pointed out that one difficulty in the way of adopting the use of concentrated infusions was that some of them would not keep well without the addition of at least 25 per cent. of rectified spirit, and he also suggested that this spirit should be utilized in obtaining the active principles of some of the ingredients which were little soluble in water.

A paper was also read by Mr. Bastick,|| in which he expressed his opinion that in order to render the concentrated infusions efficient substitutes for those of the Pharmacopœia, it was necessary to study the constituents and characters of every drug employed in their preparation, and that, in consequence of the varied properties of these drugs, no uniform method would be found applicable for the manufacture of such concentrated infusions.

Another paper was read by Mr. Schacht,** in which he advocated the use of concentrated preparations in certain instances, as they had been already acknowledged by the Pharmacopœia authorities; and he suggested that an extension of the principle would be attended with considerable advantage. He also gave a series of formulæ for their preparation.

* Pharm. Journ. 1st ser. xiv. 304.
† *Ibid.* xiv. 348.
‡ *Ibid.* xiv. 368.
§ *Ibid.* xiv. 437.
|| *Ibid.* xiv. 439.
** *Ibid.* xiv. 486.

Mr. Whipple read a paper, in which he said of the infusions* that he believed they were invaluable remedies when prepared according to the Pharmacopœia, whilst his conviction concerning the so-called concentrated infusions was that they were inadmissible in preparing prescriptions, as they were not sanctioned by the College of Physicians.

While making some remarks upon this subject, Mr. Henry Deane stated that he had made a calculation what the cost would be in a small establishment to make infusions "fresh" every morning, and he found it to be about £8.

In Mr. J. Gardner's second paper on the subject† he said that if the College of Physicians were right in ordering boiling water as the best solvent of the substances ordered to be prepared by hot infusion, he did not see what there could be to prevent the practical pharmacist from producing concentrated infusions which would keep well, and would, when diluted, be equal, if not superior, to those made in the ordinary way.

(To be continued.)

NITRITE OF AMYL.

BY C. UMNEY, F.C.S.

Although the experiments made by therapeutists with nitrite of amyl, have been upon somewhat a limited scale as compared with the research bestowed upon other novel remedial agents, still even now, without the charm of novelty, there may be many practitioners who are desirous of further experimenting with such a potent body.

In order to give the physician an opportunity of fairly estimating the value of this medicine, it is necessary that the pharmacist should supply it in a state of almost absolute purity.

It is much to be regretted that at the present time most of the nitrite of amyl, as found in the leading pharmacies in town, is far from being uniform; indeed, it is in a most unsatisfactory state, as the following experiments show.

It will, however, be well to preface the publication of the details by saying that *true nitrite of amyl* should be made by passing nitrous acid into amylic alcohol, which has been previously subjected to fractional distillation until the portion retained for use has a boiling-point of 132° Cent. A nitrite so prepared, when deprived of any excess of acid it may contain by rectification over fused potassic carbonate, will have a boiling-point of 98°–99° C.

(a.) Spec. Grav. ·865 Temperature.	Fractional distillation. Quantity distilled.
80° to 90° Cent.	0·0
90 ,, 100 ,,	65·2
100 ,, 110 ,,	20·9
110 ,, 120 ,,	2·1
120 ,, 130 ,,	1·1
Residue in retort	9·1
Loss in distillation	1·6
	100·0

* Pharm. Journ. 1st ser. xiv. 493.
† *Ibid.* xiv. 495.

(β.) Spec. Grav. ·874.

Temperature.	Fractional distillation. Quantity distilled.
70° to 80° Cent.	·6
80 „ 90	28·8
90 „ 100	33·5
100 „ 110	16·7
110 „ 120	5·4
120 „ 130	2·9
Residue in retort	10·2
Loss in distillation	1·9
	100·0

(γ) Spec. Grav. ·856.

80° to 90° Cent.	3·8
90 „ 100	12·9
100 „ 110	10·2
110 „ 120	9·9
120 „ 130	14·3
130 „ 140	28·9
140 „ 150	3·6
150 „ 160	2·1
Residue in retort	12·7
Loss	1·6
	100·0

A glance at these tables will clearly show the great difference in the various specimens examined. The deviation from the correct boiling-point evidently indicates that in specimen γ more especially, crude or merely rectified fousel oil was used for its preparation, without any previous subjection to fractional distillation.

Specimen β was certainly some little better, but far from perfection; upon α care had evidently been bestowed, but this doubtless might be considerably improved.

Surely with such a valueless basis as fousel oil, greater pains might be taken for the production of pure amylic alcohol as a starting-point, in order to produce a nitrite that would be reliable, instead of one likely to become a source of annoyance to the profession, and a disgrace to our art.

Laboratory, 40, *Aldersgate Street, E.C.*

ALOES.

BY WILLIAM A. TILDEN, B.SC., F.C.S.

The appearance of a note by the Messrs. Smith on the "Purgative Action of Aloes" affords me an opportunity for explaining one or two points in my paper on an allied subject which are not quite so clearly stated as I could wish.

Under the head 'Aloetin' in my paper, the view is expressed that it is a mixture of anhydrous aloin with a brown oxidized substance "referred to, further on." By an absurd oversight, which can only be explained by the hurried manner in which the account of these experiments was collated from my notebook, definite allusion to this oxidized substance is altogether omitted in the subsequent part of the paper. An apology for this omission is therefore due to the Conference, and acknowledgment to the Messrs. Smith for taking the trouble to draw attention to it. The following passage, however, does occur in the original paper:—"It is, of course, already known that if kept in a moist state in the water-bath for some time, the pure substance becomes gradually brown, and assumes the appearance of Socotrine aloes." And again, in paragraph IV. "The acidity to test-paper presented by an infusion of aloes is a property of the half-oxidized substance contained in the uncrystallizable *aloetin*." This was the brown substance to which I intended to refer. In the absence, as I fancied, of any evidence pointing to aloin as the active part of aloes, in presence of the experiments adduced by Robiquet (*The Chemist*, 1856), and of the fact that I have myself repeatedly taken in the course of these experiments doses of ½ grain and 1 grain of pure crystallized aloin without discovering the cathartic action with which it is credited, I attributed to this substance in my own mind the qualities for which aloes as a drug is valued. I am, however, perfectly open to receive information on this point, and to modify my opinion accordingly. My desire was to express that opinion with due caution and reserve. With reference to the employment of aloin in medical practice I must, however, say that in my own experience, and in that of pharmacists of whom I have made inquiries, aloin is but rarely prescribed here in the south, and indeed there are few druggists who keep it in stock.

The action of the air upon alkaline solutions of aloin or of aloes is to produce a body, or mixture of bodies, whose distinguishing characteristic is absolute freedom from bitterness. It was certainly not this substance which I desired to indicate as that to which preparations of aloes owe their activity, nor do I believe it to be a constituent of aloes in its ordinary condition, at least to more than a trifling extent. The main point in my paper was to furnish an answer to the question, why does decoction of aloes lose its bitterness? I reply that it is in consequence of the absorption of oxygen by the aloin; this extreme stage of oxidation being scarcely obtainable except in the presence of free alkali.

IMPROVED MOULD FOR SUPPOSITORIES AND PESSARIES.

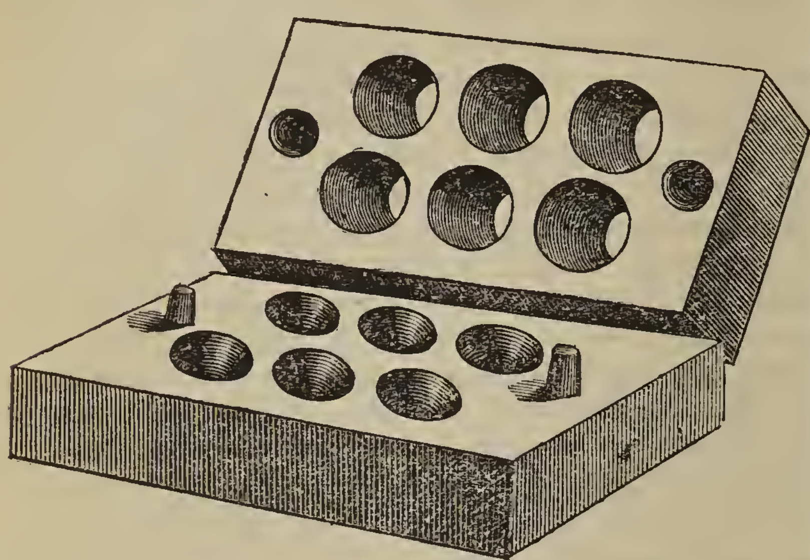
BY A. W. GERRARD,

Dispenser, Guy's Hospital.

Between three and four years ago the subject of medicated suppositories and pessaries, and the best kind of mould for casting them, engaged the attention of pharmacists, and a paper was read before the Pharmaceutical Society by Mr. H. B. Brady, in which he discussed the various means employed for moulding them, and rightly came to the conclusion that metal moulds would be found the most convenient, giving the best results. At the same time he introduced a mould, made at his suggestion, by Messrs. Maw and Son, which, I believe, has come into general use.

On examining Mr. Brady's pattern (an illustration of which may be seen in the number for May, 1866), it will be observed that it is a piece of metal divided into three by a longitudinal section passing through each row of holes, these three pieces open upon two hinges for the purpose of removing the cones; there is also a fastening at each end which holds it firmly together. Whilst using one of these, it seemed to my mind unnecessarily complicated, and that one could be made simpler and cheaper, giving equally good results.

The mould which forms the subject of the accompanying illustration is the result of my experiment. It is composed of two pieces of metal, one lying upon the other, kept in position by a pin at each end; the holes are drilled through the top into the bottom piece, the two pieces thus forming a transverse section through the apertures. The two flat surfaces which meet together form a perfect joint, the weight of the top piece of metal being sufficient to keep it in



position, so that none of the melted material can run between. The working of this mould is comparatively easy. Having poured in the substance and allowed it to cool sufficiently, it is only necessary to lift the top piece from the bottom, which brings the suppositories with it, then a gentle pressure with the thumb easily removes them. From my practice and that of others, I find this mould answers extremely well, and its simplicity over that of the other will enable it to be sold much cheaper.

I will add a few practical remarks on the successful working of the moulds, and the making of suppositories. Let the moulds be perfectly clean, and as cold as possible before using. Whilst pouring in the material, stir continually, otherwise the amount of active principle will vary in each cone. In dealing with tannin, do not use too great a heat, or it will run together, forming a resin-like mass, which is unmanageable and useless. Various agents have been proposed to assist the removal of the cones, but in my experience I have found nothing answer so well as the condensation of moisture obtained by breathing into the holes immediately previous to pouring in the fluids. If these precautions are neglected, whether this mould be used or any other, failure may be the result; it will not, however, be the fault of the machine, but of the machinist. In this as in many other branches of our profession, it is the skill, dexterity and common sense of the manipulator that ensures perfect success.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

ALUMEN.—The most interesting process by which alum is made, and by which large quantities are produced, is that in which 'alum schist' is the material employed. This mineral is a rough silicate of alumina, containing iron pyrites, $Fe\,S_2$. By roasting it, and afterwards exposing it to the air, oxygen is absorbed, and the mineral effloresces and crumbles down to a crystalline mass. This, treated with water, gives a solution which contains sulphate of aluminum and ferrous sulphate; concentrated and mixed with sulphate or chloride of ammonium it gives alum, which crystallizes out, and a salt of iron, which is drawn off in the mother-liquors.

The salt is purified by recrystallization. The alum of the Pharmacopœia is not the only salt known under this title. *Alum* is, in fact, a generic name for a class of double sulphates, containing one of the univalent metals, and one of those which, like aluminum, forms a sesquioxide. They all crystallize in octahedra, and contain the same amount of crystallization-water.

Ammonia Alum, B.P.	$(NH_4)_2SO_4$,	$Al_2 3SO_4$	$24H_2O$
Potash Alum	K_2SO_4,	$Al_2 3SO_4$	$24H_2O$
Chrome Alum	K_2SO_4,	$Cr_2 3SO_4$	$24H_2O$
Iron Alum	K_2SO_4,	$Fe_2 3SO_4$	$24H_2O$
Or	$(NH_4)_2SO_4$,	$Fe_2 3SO_4$	$24H_2O$

Common alum is soluble in about eighteen times its weight of cold water, and the solution reddens litmus strongly. [§ Its aqueous solution gives, with caustic potash or soda, a white precipitate (aluminic hydrate, $Al_2 6HO$) soluble in excess of the reagent, and the mixture evolves ammonia, especially when heated. The aqueous solution gives an immediate precipitate with chloride of barium (this shows it to be a sulphate); it does not acquire a blue colour from the addition of yellow or red prussiate of potash.] This last test is intended to indicate that it is free from iron; but no ordinary alum is ever met with so free from impurity as this would indicate. Traces of iron do not interfere with the application of alum to ordinary purposes, and probably its complete removal by any practical method would be impossible.

Dried alum is nearly insoluble in water, but recovers its solubility by long boiling.

Roche alum was originally a native salt (roche, French=rock), but is now always a factitious substance, made by stirring up some oxide of iron with alum solution whilst crystallizing.

AMMONIÆ CARBONAS.—[§ Produced by submitting a mixture of sulphate of ammonia or chloride of ammonium and carbonate of lime to sublimation.]

Ammonia gas is lost in the operation, and the salt which condenses in the solid state is of very uncertain composition. The formula given in the Pharmacopœia, $N_4H_{16}C_3O_8$, is intended rather to indicate the average composition of the commercial salt than to set it up as a compound of definite character. It appears in crystalline cakes, which are often partly made up of a white opaque portion. This is less pungent than the translucent parts, and is probably chiefly acid carbonate. When treated with a small quantity of water, it leaves a residue of acid carbonate, and also when exposed to the air it loses something to which it owes its pungency, and gives the white pulverulent odourless acid carbonate as a residue. It is usually from these characters considered to be a mixture of two salts, one of which is almost certainly the acid carbonate NH_4HCO_3; the other more volatile and soluble portion is by some believed to be the normal carbonate $(NH_4)_2CO_3$, by others the ammonic carbamate $(NH_4)\,NH_2CO_2$, or $(NH_3)_2CO_2$. The latter hypothesis is in accordance with the formula of the Pharmacopœia. The following equation would represent the changes by which it would be formed:—

$$6\,NH_4Cl + 3\,Ca\,CO_3 = 3\,Ca\,Cl_2 + 3\,(NH_4)_2CO_3.$$

Two molecules of the resulting carbonate of ammonia lose ammonia, and the remainder parts with water, so that the actual reaction is somewhat as follows:—

$$6\,NH_4Cl + 3\,CaCO_3$$
$$= 3\,CaCl_2 + \begin{cases} 2\,NH_4HCO_3 \\ 2\,NH_3 \end{cases} + \begin{cases} NH_4NH_2CO_2 \\ H_2O \end{cases}$$

Perhaps the safest and simplest course is to regard it as a compound of carbonic anhydride, ammonia and water $(NH_3)_4\,(CO_2)_3\,(H_2O)_2$.

Ammonii Bromidum.—Usually made by first digesting together iron wire, bromine and water, so as to obtain a solution of ferric bromide, and then decomposing this by a sufficient quantity of solution of carbonate of ammonia. On filtering off the ferric hydrate and evaporating down the solution, a crystalline mass is obtained. Or it may be obtained by decomposing calcic bromide by carbonate of ammonia. The iodide of ammonium is prepared in a similar manner.

[§ A solution of the bromide in water, mixed with mucilage of starch and a drop of an aqueous solution of bromine or of chlorine, does not exhibit any blue colour.] This test shows the absence of iodide; should any part of that salt be present iodine would be liberated, $2\,NH_4I + Br_2$ or $Cl_2 = 2\,NH_4Br$ or $2NH_4Cl + I_2$, and this would form with starch the characteristic blue compound.

Ammonii Chloridum is formed by neutralizing the ammoniacal liquors obtained in gas-making with hydrochloric acid and evaporating till the solution crystallizes. The salt is purified by sublimation. The ammonia which exists in these liquors in the form of carbonate, sulphide, cyanide, etc., is the result of the decomposition at a high temperature of the nitrogenous constituents of the coal. Chloride of ammonium generally contains a little iron and traces of tarry matters; frequently, too, the chlorides of volatile alkaloids (compound ammonias) are present in minute quantity.

CITRATE OF IRON AND QUININE.

In the Practitioner for October the following table is given, showing the results of analyses of six specimens of citrate of iron and quinine purchased in London. According to the British Pharmacopœia, this preparation should contain 20 per cent. of ferric oxide and 16 per cent. of quinine.

No. I.—A. Cooper, Abingdon Terrace, Kensington.—Olive-green scales.

No. II.—W. Lambert Kiddle, 34, Tavistock Place.—Dark olive-green scales.

No. III.—W. J. Jones, 3, Newland Terrace, Kensington.—Very small olive-green scales.

No. IV.—Burgoyne, Burbidges and Co.—Pale yellowish-green scales.

No. V.—Glover and Co., 19, Goodge Street, W.—Golden-brown scales.

No. VI.—Knowles, 33, Seymour Street, Euston Square. Golden-brown scales.

	Ferric oxide.	Quinine.
B. P.	20 per cent.	16 per cent.
No. I.	19·3 „	17·5 „
No. II.	20·2 „	16·2 „
No. III.	21·4 „	15·4 „
No. IV.	21·3 „	7·1 „
No. V.	20·9 „	4·2 „
No. VI.	20·4 „	4·1 „

CUCUMBER OINTMENT.

Mr. Luther E. Sale, of Huntsville, Alabama, publishes in the *Chicago Pharmacist* the following as a simple formula for making cucumber ointment:—

Take of Oil of Sweet Almonds, seven fluid ounces.
Spermaceti, eighteen drachms.
White Wax, five drachms.
Glycerine, one fluid ounce.
Green Cucumbers, 4 lb.

Cut the cucumbers in small pieces, mash them in a Wedgewood mortar, let them macerate in their own liquor for twelve hours, express and strain; melt the almond oil, spermaceti and wax together by means of a water-bath; add the strained liquor, stirring constantly, so as to incorporate the whole together. Set aside in a cool place (an ice chest preferred) till it becomes hard, then beat with a wooden spoon to separate the watery portion of the cucumbers from the ointment; pour off the liquor thus obtained, and mix the glycerine with the ointment without the aid of heat by working it with the hands until it becomes thoroughly incorporated. Put up in four-ounce jars, cover with a layer of rose-water, and set aside in a cool place. The ointment prepared in this way will keep sweet and nice for twelve months.

DETECTION OF ADULTERATIONS IN COPAIVA BALSAM.

BY DR. H. HAGER.

The author has met with copaiva balsam adulterated with oil of sassafras. The adulteration is detected in the following manner: 1 c.c. balsam and 2 c.c. concentrated sulphuric acid are mixed; after the mixture has cooled, 20 c.c. alcohol are added, the mixture is heated to boiling, and then set aside. If the balsam be pure, after the addition of the alcohol, a milky grey yellowish or pale reddish yellow liquid is obtained, which on boiling becomes yellow, clear and transparent, a resinous compound settling to the bottom. If adulterated with oil of sassafras, the addition of alcohol produces a dark brown-red colour, becoming after boiling much darker, with a tint of violet, similar to the juice of black cherries.

Oil of turpentine, which is probably rarely used as an adulterant, is readily detected by heating slightly two to four drops of the balsam, dropped upon bibulous paper, in such a manner that no visible vapours are evolved. Oil of turpentine evaporates first and is recognized by its odour.

This test is unreliable if Venice turpentine is used for adulteration. The author invites experiments with the following test, which has given him reliable results: 5 or 6 drops of water and 5 to 7 c.c. balsam are mixed in an evaporating-dish with sufficient levigated litharge to form a thick semi-liquid mass. At a temperature of 20° to 25° C. (68° to 70° F.), a well-marked turpentine odour is given off, if the balsam contains but 10 per cent. Venice turpentine, and even 5 per cent. may be still recognized.

An approximate quantitative estimation of the adulterant may be made as follows: 5 grams balsam, 8 to 10 drops water, and 15 grams litharge are heated for a quarter of an hour in a sand-bath, then for several hours in a water-bath. After cooling, the hard mass is rubbed to powder and boiled with benzin, the liquid evaporated and the residue macerated with 90 per cent. alcohol for several hours. The alcoholic filtrate evaporated to dryness, leaves about 0·2 to 0·3 resin, which when boiled with solution of potash, yields a filtrate which is not or scarcely tinged by sulphide of ammonium. In the presence of turpentine, however, this last residue contains about three-fourths of the resin of the adulteration, and yields with potash a liquid in which sulphide of ammonium produces a bulky brown-black precipitate. The lead compound of the resin of turpentine is soluble in benzin and alcohol, but not the corresponding compound with the resin of copaiva.—*Ph. Cent. Halle*, 1870, 296, 297.

AMOUNT OF ARSENIC IN PHOSPHORUS OF COMMERCE.

BY C. J. RADEMAKER, M.D.

In preparing dilute phosphoric acid according to the process of the U. S. P., the author passes a current of sulphydric acid through the solution, in order to free it from all substances precipitable by that agent in acid solutions, invariably obtaining a yellowish precipitate, which upon examination proves to be sulphide of arsenic.

In order to find the amount of arsenic present in a given quantity of phosphorus, he has resorted to the following process:—

100 grammes of phosphorus were oxidized with nitric acid, the solution diluted and the arsenic precipitated as a sulphide (AsS_5) by means of sulphydric acid, the solution allowed to rest for six days. The precipitated sulphide of arsenic was collected on a filter and washed, transferred to a small evaporating dish and oxidized with nitric acid, and reduced by means of sulphurous acid to arsenious acid, and precipitated in the form of AsS_3, by means of sulphydric acid; the precipitate digested with ammonia, in order to free it from the small amount of sulphur present, the solution filtered from the undissolved matter, and evaporated, dried and weighed, and found to weigh 15 grains, or nearly one gramme.—*American Journal of Pharmacy.*

AN ELEGANT COUGH MIXTURE.

Hydrochlorate of Morphia . . gr. ss
Glycerine . . . . 2 fluid ounces.
Mix. A teaspoonful when the cough is troublesome.

Poisoning by an Escape of Gas.—An inquest has been held at Leeds concerning the death of five persons supposed to have been suffocated by coal-gas during the night of the 12th and 13th November. It appeared that the deceased, who lived in two adjoining houses, were known to have been in good health on the previous day. The families not making their appearance as usual on the 13th, the police and others, late in the day, broke open the doors and windows, when two bodies in one house and two children in the other were found dead. The father and mother of the children were insensible, and the father has since died.

Mr. J. E. Jenkins, surgeon, said that he had made a *post mortem* examination of the body of one of the deceased children, and he was of opinion that death had resulted from narcotism produced by coal-gas. On the bedroom being filled with gas there would be first stupor, then vomiting, and soon total insensibility, which would end in death by the exclusion of atmospheric air.

Evidence was given that upon search being made, it was found that the main-pipe between the two houses was broken across. This seemed to have been caused by the subsidence of earth resulting from the making of a drain underneath.

The jury found a verdict of "Accidental death," with a recommendation to the authorities to require gas-mains to be put on solid ground by the parties to drainage operations.

A New Source of Lead Poisoning.—Dr. Johnson reports in the *British Medical Journal*, a curious case of lead poisoning that has come under his notice at King's College Hospital. There were well-marked symptoms of lead poisoning in the patient, but there was no evidence as to the source of the lead. Upon being questioned as to the materials used in his trade, the patient, who is a portmanteau maker, said that he worked much with a black glazed cloth, which he called "overland cloth," used for making portmanteaus and covers. A portion of this cloth was obtained and examined for lead. Three or four square inches of the glazed cloth were incinerated in a porcelain crucible; a considerable quantity of a greyish-white ash was thus obtained. This was treated with nitric acid, which dissolved it pretty completely with a brisk effervescence. Lead was found in the filtered solution by the following tests:—(1) a white sulphate on the addition of dilute sulphuric acid; (2) a yellow precipitate of chromate on the addition of potassic chromate; (3) a yellow iodide in silky scales on the addition of potassic iodide. The reaction in each case was well marked. The ash contained also a good deal of chalk. Dr. Johnson supposes that the man, who works at his own home, and confesses that he often takes his meals without washing his hands, in cutting the cloth would get his hands covered with the lead-contaminated dust, and that some of this would be swallowed with his food. The man says, too, that he is in the habit of using the cuttings and remnants of the cloth as fuel, and it is possible that some volatilized lead might enter the system through the lungs.

The Colour of Butterflies' Wings.—A writer in *Nature* says that wishing to test the effect of acid on the colours of the wings of a butterfly or moth, he applied muriatic acid to a dried and set specimen of the six-spotted burnet (*Zygæna filipendulæ*). The only change that followed in this and subsequent experiments was that the red became yellow; where there was no red there was no change. Upon applying the acid to the red parts of the red admiral butterfly (*Vanessa atalanta*), no change took place. Comparative examination under the microscope failed to explain the phenomenon, which appears to point out a clear difference in the nature of the wing of a moth and that of a butterfly. A remarkable fact, perhaps connected with this, is that a yellow variety is known of almost every moth containing red in the wings.

Nitro-Glycerine Explosion.—At Frankfort, near Painesville, Ohio, on November 1, two magazines, containing 150,000 lbs. of nitro-glycerine, exploded. Four persons were killed. The buildings in the neighbourhood were greatly damaged, the shock from the explosion being felt for miles. Where the magazines stood are now two ponds of water, 50 feet across and 75 feet deep. The loss to the Glycerine Company is estimated at not less than 25,000 dollars. This is the second explosion of the kind within two months.—*Times.*

Oil of Peppermint as a Local Anæsthetic.—Dr. Alfred Wright, writing to the *Lancet*, says, that a few years ago, when in China, he became acquainted with the fact that the natives, when suffering from facial neuralgia, applied oil of peppermint to the seat of pain with a camel-hair pencil. Since then, in his own practice, he has frequently employed oil of peppermint as a local anæsthetic, not only in neuralgia but also in gout, with remarkably good results. He has found the relief from pain to be almost instantaneous.

Water-Glass as a Bandage.—Professor Darby, of the University of South Carolina, speaks very favourably of the employment of liquid glass in the formation of immovable bandages. He considers it preferable to either gypsum, dextrine, glue, or starch. The mode of application is to envelope the limb in wadding, to protect prominences of bone from undue pressure, and round the wadding to wrap three or more bandages of unglazed muslin, each bandage being freely painted with silicate of potash. Between the second and third bandages strips of muslin saturated in the solution may be applied, to give extra support to the broken parts. The limb should be kept at perfect rest until the bandages are dry, the time required varying from three to twelve hours, according to the amount of material used.—*Medical Times and Gazette.*

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 26, 1870.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

HENRY DEANE.

We cannot too cordially thank our contemporary, the *Chemist and Druggist*, for the admirable memoir given in its last number of Mr. DEANE. The editor exercised a wise discretion in publishing the paper intact as an autobiography, although, as we gather from the apology offered for doing so, it was sent rather as memoranda from which he might cull such material as suited him for the pages of his journal. No curtailment could have made the record more modest, no addition more interesting and valuable. We would that this memoir could be perused by every registered apprentice and student of our Society, nay, by every youth entering on the business of life, to whom it is all-important to feel that "there is nothing beneath the dignity of a man which is not dishonourable!"

To those who know HENRY DEANE the perusal must be a source of immense pleasure. We laid aside the paper, refreshed by the contemplation of his continuous effort to pursue the right path, to build up knowledge brick by brick, and, while following science for pure love of her, yet so to utilize her benefits at every step as to make himself a benefactor to his fellow-men as well as an ornament to his profession. Long may HENRY DEANE be with us to continue his career of usefulness, and enjoy the respect he has so justly earned!

A FEW copies have lately arrived in England of the 'Supplement to the Pharmacopœia of India,' which consists of a catalogue of Indian synonyms of the medicinal plants, products, and inorganic and organic substances included in the Indian Pharmacopœia, in fourteen languages, with explanatory and descriptive remarks. It has been prepared by Mooden Sheriff, G.M.M.C., and printed and published by order of the Government at the request of the Committee of the Pharmacopœia of India. We hope shortly to be furnished with a copy, so that we may be enabled to give a much fuller notice of the work in our pages.

WE are sorry to hear that the delay in the arrival of the October number of the *Chicago Pharmacist*, has been caused by the occurrence of a fire at the establishment in which it was printed. The whole of the stock of the *Pharmacist*, which was unfortunately not insured, has been entirely destroyed.

THE persistency with which the word "Ozokerit" was kept before the public in advertisements for a considerable time caused an amount of curious speculation, which was remarkably illustrative of the general ignorance prevailing even among the educated classes in regard to natural productions and phenomena. At a time when petroleum and paraffin are things of every-day familiarity, it seems strange, indeed, that no one should have recognized in the name which caused so many silly surmises, an ordinary mineralogical designation of earth-wax, or the natural paraffin, occurring abundantly in Galicia, the Danubian provinces adjoining the Carpathians, and even in this country to some extent. Specimens of it exist in most mineralogical collections, and a report of a chemical examination of the substance was published in the first series of this Journal.*

As will be seen by an advertisement in another part of the Journal, dispensers are required for two of her Majesty's foreign hospitals. The candidates must have passed the Major examination of the Pharmaceutical Society, and be not less than twenty or more than twenty-five years of age.

THE fact that the highest of Civic dignities in this country is now held by a member of the drug trade will be sufficient reason for our pointing out that in several provincial towns the office of mayor is held by members of the trade. Thus at Reading the mayor is PETER SPOKES, Pharmaceutical Chemist; at Launceston, JOHN CHING, Chemist and Druggist; at Richmond, Yorkshire, THOMAS THOMSON, Pharmaceutical Chemist; and at Newbury, R. A. RYOTT Chemist and Druggist.

VISITORS at the Liverpool meeting of the Pharmaceutical Conference will be glad to learn that at a late meeting of the Liverpool Chemists' Association the valuable services of Mr. A. H. MASON, in connection with the exhibition of pharmaceutical objects, met with special recognition, and that the President presented him with three handsomely bound volumes, Longfellow's 'Hyperion,' and Meteyard's 'Life of Wedgewood,' containing the following inscription:—

BRITISH PHARMACEUTICAL CONFERENCE.
Liverpool Meeting, 1870.

This volume, with two others, was presented to Mr. ALFRED H. MASON by the Local Committee, as an expression of their high appreciation of his services, especially in connection with the arrangements for the exhibition.

(Signed) *Chairman*, JOHN ABRAHAM.
Hon. Secretary, EDWARD DAVIES, F.C.S.

It must be as gratifying to Mr. Mason, as it is well deserved to receive such a mark of appreciation.

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* Pharm. Journ. Vol. XIV. 381.

Proceedings of the Pharmaceutical Society.

ERRATUM.

P. 411, col. 2, First or Preliminary Examination.
for Stefford, Charles,
read Hefford, Charles.

EDINBURGH MEETING.

The First Meeting of the Session took place in St. George's Hall, 119A, George Street, on Tuesday evening, 21st November, at 8.30 P.M.; Mr. AITKEN, President, in the chair. There was a good attendance. The Secretary announced—

1. The following additions to the Library:—Pereira's Materia Medica. Squire's Companion to the B. P., 7th edition, 1869. Balfour's Manual of Botany (new edition). Animal Chemistry (Odling). Attfield's Chemistry (1869). Bentley's Manual of Botany, 2nd edition. Roscoe's Elementary Chemistry. Selecta e Præscriptis, 2 copies.
2. The following presentations to the Library:—Edinburgh Medical Pharmacopœia of 1722, presented by J. Wilson, Perth. Milne's Materia Medica, 1869, presented by the publisher. Several Numbers of the 'Pharmacist.' Proceedings of American Pharmaceutical Association.
3. Presentations to the Museum:—Two very handsome specimens of Sugar of Milk, from J. C. Pottage, Edinburgh. Various Articles used in the preparation and dispensing of Medicines, from Messrs. Poths and Haas, London. A Series of Sixty-six dried Medicinal Plants, carefully laid down on papers from Mr. Ransom, of Hitchin. These were very much admired.

The PRESIDENT then made the following remarks:—

Gentlemen,—You will have seen from the billet calling this meeting that I am expected to give a few opening remarks.

I am glad that on the present occasion I am neither to be burdened nor to burden you with a long speech, the more so, as I doubt not you are looking forward with some degree of impatience to the interesting paper we are to be favoured with from our esteemed and talented friend Dr. Stevenson Macadam.

Our museum and library are at present in good working order. The curator of the museum will be glad to arrange to meet young men who are desirous of becoming acquainted with the specimens there, for an hour in the evenings, and for this purpose, the Secretary will receive the names of those who may wish to attend, in order that due arrangements may be made, and the time fixed. The admittance will be free to all connected with the Pharmaceutical Society.

The catalogue of the library contains a fair number of works on scientific subjects well worthy of your earnest attention. The Council, therefore, would be well pleased to see those more fully appreciated, and they invite all

"To read who have not read before,
And those who always read to read the more."

A complaint very frequently made, by those particularly who would be well pleased to get over their examinations with the smallest amount of labour or study, is that they have not been taught this or that branch in early life. It may be so, but we are inclined to think, and do consider such excuses as a sort of refuge for inert minds, for generally we find the things a man knows best are those he teaches himself when his mind is matured. Much, no doubt, may be done to improve what is termed a neglected education, but we would have you bear in mind, education to be efficient can never limit itself to the mere giving of information; that the development of the mental powers, the guidance of the mental tendencies, and the formation of taste, are at least of equal importance. It behoves us then to depend as much on our own resources as on the tuition of others. At the same time we ought to lose no opportunity for improvement, in whatever shape it may be placed before us. You cannot, and therefore need not expect all to be prizemen; you may not achieve the greatness or excellence attained by others, but do not imagine you are inferior to them because of the condition in which you may be placed.

"Honour and shame from no condition rise;
Act well your part, there all the honour lies."

As the most casual observer cannot fail to perceive the gigantic strides education has made within the last few years among all classes, he will not fail to discover at the same time the increasing attention being paid to its extension. It is also one of the most encouraging features of our times that much of our former literature, which could find its way to the libraries of the wealthy only, has now been brought within the reach of almost every one.

We would, therefore, have you to read and master what you read, cultivate habits of thinking, and by these means you may place your foot upon the ladder of elevation, which but a few years since could only be surmounted by some genius. Let it be your earnest desire to raise yourselves in the social scale as intellectual and moral beings, keep always in mind, that as

"The twig bends, the tree inclines."

Gentlemen, before closing these few and imperfect remarks, allow me to thank you for the honour conferred in placing me for the third time in the Presidential chair. I beg to say the duties will be performed to the utmost of my ability, and, I trust, to your satisfaction.

Dr. STEVENSON MACADAM read an interesting paper on "Fermentation." He referred to the old theory as to the effect of a nitrogenous substance upon one that was not so, and then introduced the more recent experiments of Dr. Tyndall, M. Pasteur and Dr. Angus Smith. He also referred to the striking effect produced by a certain amount of heat in destroying the spores or germs present in the atmosphere, and which were now believed by many to be the means, acting upon sugar and other materials, of causing the peculiar change which yeast effects in inducing and carrying on fermentation. Dr. Macadam illustrated his subject by several diagrams and tables.

At the close of the paper, a cordial vote of thanks to Dr. Macadam for his interesting and instructive communication, proposed by Mr. BAILDON and seconded by Mr. YOUNG, was unanimously carried.

The SECRETARY then intimated that he would be glad to receive the names of any young men who wished to meet with the Curator of the Museum, who had kindly agreed to devote an hour in the evenings to go over the various specimens contained in the Museum. These meetings would be free, and open to all connected with the Pharmaceutical Society.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

The Annual Meeting of this Society was held in the Library of the Association, on Wednesday evening, October 12th, 1870.

The minutes of the previous meeting were adopted, when the following gentlemen were unanimously elected Members and Associates:—

MEMBERS.

Charles Daniel Hart........Burley Road.
John William Hardman ....Woodhouse Lane.
Edward Fenton Atkinson ...Kirkstall Road.

ASSOCIATES.

George Fell Bowman, residing with Mr. Bowman.
John Bradley, " Mr. Stead.
John Exley, " Mr. Exley.
John William Dewhirst, " Mr. Beedle.

The HONORARY SECRETARY then read the

REPORT.

In presenting their Report, your Committee have to state that there is an increase in the number of Members of two as compared with that of last year; but in the number of Associates there is a decrease of eleven. The numbers now in the Association are as follows:—

Members 37
Associates.............. 39

The decrease in the number of Associates is anything but satisfactory, and seems to indicate a feeling of apathy in the junior members of our trade; and your Committee strongly exhort those rising up amongst us to avail themselves of the privileges so liberally offered for a small fee.

The privileges of an Associate are—

1st. Access to a valuable and gradually-increasing library and materia-medica cabinet.

2nd. Admission to the lectures and discussions of the Society at the monthly meetings during the session.

3rd. If an Associate wishes information upon any particular point, a written query dropped into the question box elicits the desired intelligence.

4th. Attendance at certain chemical and botanical lectures at the lowest fees.

5th. Power to compete for certain prizes occasionally offered. Probably, if more would come forward to contest, more prizes would be forthcoming.

All these advantages are open to our Associates at the nominal charge of 2*s.* 6*d.* per annum, or a fraction over one halfpenny per week. Your Committee, therefore, earnestly urge upon all assistants and apprentices in this district that, if for no other reason, they ought from a feeling of self-interest to join the Leeds Chemists' Association.

At the last annual meeting, after the transaction of the usual yearly business, the newly-elected President, Mr. Wm. Smeeton, read an address in which he earnestly advised our associates to cultivate habits of observation and of mental application. At the second meeting, Mr. E. Thompson gave an interesting account of the construction and uses of a few meteorological instruments lent for the occasion by Messrs. Harvey, Reynolds and Co. Mr. James Abbott occupied the third meeting; subject, "Palms and their Products." The paper read was interesting and full of facts. At the fourth meeting, a Member failing to be ready with the expected paper, Mr. R. Reynolds considerately filled up the gap, and reviewed some portions of the proceedings of the American Pharmaceutical Society. Mr. Samuel Taylor read, at the fifth meeting of the session, an essay "Upon some Articles of Every-day Request." The President favoured the concluding meeting with the results of his experience in the preparation of linimentum potassii iodidi cum sapone, and of chloral hydrate; and, after a short discussion, Mr. E. Thompson introduced the proposition of the Council of the Pharmaceutical Society with respect to certain proposed regulations for keeping, selling, and dispensing poisons. The proposed regulations, being considered unnecessary and prejudicial to the interests of the trade, a committee was appointed to draw up a memorial against the same, which, with a statement of objections attached thereto, was presented to the Council of the Pharmaceutical Society. The effort made was successful, and it is not likely that the objectionable regulations will ever become law.

Your Committee thankfully acknowledge the receipt of some valuable gifts to the library and museum:—'The Pharmaceutical Journal,' from the Pharmaceutical Society; 'A Medico-Botanical Map of the World,' and two books of labels, from Mr. Barker, of Liverpool; 'A Post-Office Directory of the Manufacturing and Retail Chemists of England,' from Mr. Edwin Yewdall; Portraits of Dr. Pereira, Mr. Wm. Allen and of the late Jacob Bell, Esq., from Thomas Hyde Hills, Esq.; 'The Chemists and Druggists' Almanack,' from Mr. R. Reynolds; nine specimens of roots, fruits, etc., from Mr. James Collins, Curator of the Pharmaceutical Society; 'A Collection of Prescriptions,' from Joseph Ince, Esq.; three specimens of fruits, etc., from Mr. R. Reynolds.

In order to secure the successful working of the library, it has been judged expedient to alter certain bye-laws.

Four Associates competed for the prize of one guinea offered by Thomas Harvey, Esq., for the best herbarium. Two of the herbaria were not very unequal, and yet much superior to the others; and Mr. R. Reynolds therefore kindly offered a prize to be given to the collector of the second in order of merit. The first prize was obtained by Mr. Frederick Casson, and the second was awarded to Mr. Francis Mather.

Twenty-two Associates have attended Mr. Ward's lectures on chemistry, and, according to that gentleman's statement, have made creditable progress. Seven of these have passed the Science and Art examination.

Messrs. R. M. Atkinson and R. Reynolds attended the British Pharmaceutical Conference, lately held in Liverpool, as delegates from our Society.

Your Committee deeply regret the resignation of their Secretary, Mr. Edwin Yewdall, on account of ill-health and by medical advice. Whilst tendering him their hearty sympathy on this occasion, they offer him warm thanks for the unremitting zeal he has manifested in furthering the interests of the Association, and trust at the next annual meeting he will feel able to resume those duties which he has heretofore so satisfactorily discharged.

When the accounts were audited, it was ascertained that there was a balance due to the Secretary of nine shillings and sixpence.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The First Ordinary Monthly Meeting of the session was held in the Memorial Hall, Albert Square, on Friday evening, November 4; Mr. W. S. BROWN, President, in the chair. Tea was served at 7 P.M.

The formal business of the meeting included the election of about twenty new associates.

A resolution was then passed expressive of the deep regret felt by the officers and members of the Association on hearing of the death of Mr. Charles Wright, so long and honourably connected with the business in Manchester.

Letters were read from Professor Attfield and Mr. T. H. Hills expressing their satisfaction in having been elected honorary members of the Association.

The PRESIDENT then called on Mr. Benger to introduce the subject chosen for discussion, "Pharmaceutical Education and Apprenticeship," by reading a paper he had contributed to the British Pharmaceutical Conference.

Mr. BENGER having read this paper, added, it was scarcely an appropriate introduction of the subject to a local association. He hoped nothing he had said would be construed into disrespect for any of the older members of the trade. Nothing could be further from his intentions than to depreciate the value of apprenticeships served to some non-scientific chemists and druggists; there are hundreds of thoroughly practical men whose success amply testifies to the wisdom and skill with which they have conducted their businesses. The privilege of serving an apprenticeship to such men is great, and will be appreciated by all sensible young men. Business habits cannot be acquired in the lecture-room, but by the careful, observant study of the business transactions of honourable men. An important point seems to be, how much and what kind of personal scientific instruction the apprentice can reasonably expect to receive at the hands of his master. He must depend mainly on his own efforts; he pays a premium to be introduced into a special field of observation, the amount of premium generally depending on the extent of that field, while the advantages he derives depend on his own powers of observation and the use he makes of them. It is essential to his success that he shall have acquired previously, or that he acquire at an early stage of his apprenticeship, some knowledge of the sciences bearing upon pharmacy. Should his master be competent and willing to undertake the direction of his studies in these subjects, so much the more money value should be attached to the indenture, but this should be clearly understood by the contracting parties. It must not be assumed that a body of men accustomed to conduct businesses in which scientific knowledge has been often wellnigh superfluous shall, upon the passing of a Pharmacy Act, be able suddenly to transform themselves into professors of chemistry and botany. Should the medical profession confine itself more strictly to the practice of its legitimate duties, the rising generation of pharmacists may, and doubtless will, have more general need of scientific knowledge; and, having availed themselves of the facilities now afforded for its acquirement, will, in their turn, be competent to instruct their apprentices in these higher branches of pharmaceutical education, but he thought that in ordinary apprenticeships the masters' responsibility does not extend so far. On the other hand, accurate scientific knowledge of no trifling nature is absolutely demanded by the Pharmacy Act, and the apprentice has a perfect right to inquire what opportunities will be afforded him for meeting these requirements. In London and large provincial centres, where courses of lectures are provided with a library and museum open for study, much difficulty need not be apprehended; but there still remains a large number of apprentice-taking businesses scattered throughout the smaller towns of the country where such opportunities do not exist; and in such situations a young man who had previously become possessed of a sound elementary education in science would have many advantages over his fellows located in large cities,—more leisure and more opportunities for following up some of his studies. It is probable that the improved school system about to be introduced by Government will afford such an education, otherwise it might be given in some such special technical school as he had suggested; failing these, it will always be desirable that the apprentice, on completing his term, shall obtain employment where the efforts of local association have provided the necessary means of scientific education. There is, he feared, in the present day much danger of regarding the passing of examinations as the main object of study, and an inclination to do just so much and no more than would ensure that end. It is this spirit which encourages the pernicious system of cramming. The chief aim of elementary scientific education must be to create a taste for and a love of the subject. In conclusion, he quoted some remarks bearing on this by the late Dr. Channing:—"The mark of a good teacher is not only that he produces great efforts in his pupils, but that he dismisses them from his care, conscious of having only laid the foundation of knowledge, and anxious and resolved to improve themselves. One of the sure signs of the low state of instruction among us, is, that the young on leaving school feel as if the work of intellectual culture were done, and give up steady vigorous effort for higher truth and wider knowledge. The universe is charged with the office of education; it is not confined to a few books anxiously selected by parental care. Innumerable voices come from all they see, meet, feel. Nature, society, experience are volumes opened everywhere, and perpetually before their eyes. They take lessons from every object within the sphere of their senses; from the sun and stars; from the flowers of spring and from the fruits of autumn; from every associate from the pursuits, trades, professions, in which they move; all these, and more than these, are appointed to teach, awaken, and develope the mind.

Mr. Waterhouse (Ashton) agreed in the main with what had been said, but he thought if apprentices had received a good English education, there would be no great difficulty about technical matters, with the help of Associations like their own.

Mr. Siebold remarked on the much larger proportion of successful candidates in the examinations than formerly, and attributed this partly to the help of local associations.

Mr. Wilkinson said that all the 11 apprentices who had presented themselves at the last "Preliminary" in Manchester had passed, still there was a very large proportion of those who had examinations to pass who could not or did not avail themselves of the lectures and classes now going on.

Mr. Woolley, alluding to the proposed assistance from the Pharmaceutical Society, thought such help should be at first directed to those who had entered the business previous to the passing of the Pharmacy Act.

The Chairman, Mr. Siebold, Mr. Bostock, and others, spoke with approval of the class for mutual improvement which had just been formed amongst the associates, the Chairman promising that the Council would give it all possible assistance and encouragement.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Second General Monthly Meeting of the present Session was held in the rooms of the Association, on Wednesday, November 9th; the President, Mr. Wilson, in the chair. A lecture was delivered by Mr. F. T. Griffiths, Esq., M.D., upon "The Nightshades,"—it was of a most interesting and instructive character, comprising an enumeration of the natures, properties, and histories of the varied classes belonging thereto. The following is a brief abstract.

The *Solanaceæ*, or Nightshade family, constitute one of the richest and most interesting group of plants, and their history is also very complex. If amongst them are some worthy of honourable mention, there are many, on the contrary, which come short of glory. Nightshades and felonworts do not all possess lenitive properties; there are in the group many other plants, and, perhaps, the best known are those which represent nothing less than a collection of violent poisons. The general physiognomy of these unwholesome plants fully justifies the unflattering names given to them from the time of Linnæus, who termed them all livid, even to that of modern botanists, who stigmatized them as suspicious, venomous or hideous. Poisonous principles are entirely absent in some species, or, if present, are so in such small proportions as to exercise but feeble influence over the animal economy; whenever they are secreted in an appreciable quantity, we may affirm that they are similar, and that they belong to that class of poisons which are specially noxious and stupefying. The special details of this family of plants afford sufficient materials for the purpose of classification, and botanists have been able to establish the characteristics rigorously based upon the nature of the fruit, sometimes bacciform, *id est*, more or less succulent, as that of the tomato or the potato, and sometimes capsular, that is dry, like those of tobacco and of the stramoniums. Thus they have been grouped into two grand general sections, subdivided into six varieties, and from these we select and glance rapidly at the history of the most important species.

Belladonna, *Atropa Belladonna*, whose generic name was taken by Linnæus from that of Parque, *Atropus*, owes its specific name of "beautiful lady" to the reputation which lotions compounded from the plant had in Italy for preserving beauty; this solanum is tolerably common everywhere in woods and uncultivated spots around our dwellings; it hides in the angles of old walls and ruins, and it is thus too often found by children and ignorant persons, who, seduced by its aspect and sweet taste, become victims to their curiosity. The stems and the root are not less dangerous than the leaves and berries; amongst the symptoms of intoxication by belladonna is that which is termed *carphologie*, which means a seeking for little objects; the affected person imagines he sees insects everywhere around him, small birds continually flying before him, and he madly excites himself in their useless pursuit; amongst the numerous symptoms of poisoning by this plant are violent delirium, extreme agitation, frightful visions, dilatation of the pupils of the eye, etc.

Thorn-apple, *Datura Stramonium*, known also under various names as stramonium, devil's herb, or sorcerer's herb; the Arabs call it datora, the Persians tatula,—the word is manifestly derived from the radical "tat," which means to prick or puncture, in allusion to the spinous envelope by which the fruit is protected. It is of all poisonous solanals the most energetic and the most remarkable; it is the one which has caused the most serious accidents. A decoction of three capsules, made with milk, was taken in mistake by a man, and it occasioned in him a furious delirium, followed by general paralysis, which continued for several weeks.

The hyoscyamus, nicotiana, mandragora, *Solanum Dulcamara*, etc., were also fully treated of, and their poisonous natures and peculiarities illustrated by numerous interesting anecdotes by the lecturer, who proceeded at some length to describe the alkaloids—atropine, hyoscyamine, daturine, solanine and nicotine, their therapeutic properties, physiological action, etc., and concluded by a short *résumé*, in which he spoke of the general symptoms produced by the toxic action of the solanals, manifesting themselves with a constancy which supplies valuable indications for the treatment of the poisoned victims, and for the detection, and perhaps punishment, of the poisoner. The eminently irritating action of the solanals concentrates itself in the brain, where it is rendered manifest by the contraction of the temples, the redness of the face, the intense headache, delirium and convulsions. Irritation is then the first effect produced. Later on, a second effect is stupor; but it must be borne in mind that this stupor is only due to the irritation exalted to its highest pitch; it is only when the cerebral inflammation has, by congestion, distended the vessels and tissues of the brain so as to cause their compression against the bones of the skull, that dull and profound narcotism begins. This narcotism differs also from that produced by certain other somniferous plants, such as opium, for example. In the latter case, it is rather a languishing of the nervous system, or the retardation of the circulation of the blood which induces sleep; in the former, on the contrary, it is because the blood is over-driven at first, and subsequently reduced to impotence by the excess, that the vital activity falls into torpidity.

At its conclusion a cordial vote of thanks was awarded by the members present to the lecturer.

Messrs. Branson, Collinson, Davy, Horsfield and A. and C. Laycock, of Rotherham, were elected members, and Messrs. Blacker, Booth, Hollinrake, Johnson, Learoyd, Robson and Thomson, associates.

The PRESIDENT announced the following donations to the library and museum:—Thirty-seven bound volumes of the *Lancet* and seven volumes of Bell's 'Surgery,' from Mr. Nathaniel Booth, of Rotherham, and a cabinet collection of minerals and metals from Messrs. Cutley and Preston, High Street.

Mr. G. B. COCKING proposed and Mr. HUDDLESTONE seconded a vote of thanks to Mr. Booth, and Mr. WILSON proposed and Mr. WATTS seconded a vote of thanks to Messrs. Cutley and Preston for their handsome donations, both of which were unanimously carried. This concluded the business of the meeting.

DUNDEE CHEMISTS AND DRUGGISTS' ASSOCIATION.

The First General Meeting of Session 1870-71 was held in Lamb's Hotel on the 9th of November; Mr. LAIRD in the chair.

The following were elected office-bearers for the session:—*President:* Mr. Wm. Laird, Ph.C. *Vice-President:* Mr. David Russell. *Treasurer:* Mr. G. Jack. *Secretary:* Mr. Jas. Russell. *Council:* Mr. A. B. Anderson, Mr. Wm. Doig, Mr. D. H. Ferries, Mr. C. Kerr, Ph.C.

The report from the Committee having been read, it was resolved to rent a room, in order to facilitate the formation of classes for instruction of apprentices in chemistry, materia medica and pharmacy. A Committee was appointed.

A vote of thanks to the Chairman terminated the proceedings.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Second General Meeting of this Association was held at the Royal Institution, on the 10th November; the President, Mr. JOHN ABRAHAM, in the chair. There was a large attendance.

The minutes of the previous meeting were read and confirmed.

Letters were read from Messrs. Attfield, Stoddart, and Hills, acknowledging their election as honorary members.

Mr. Joseph Hallawell, Mr. Charles C. Bell, and Mr. Thomas Williams were elected members.

Mr. William Hallawell, Mr. Edward Olivant, and G. Harriman were elected associates.

The PRESIDENT exhibited a bottle, labelled "Palatable Cod-Liver Oil," which contained a mixture consisting of nine parts of cod-liver oil and seven parts of syrup, flavoured with lemon and oil of aniseed or dill. Particular care was taken to cover the whole of the bottle with the labels, and prominent instructions were given that "the bottle should be well shaken." He observed that a circular accompanied each bottle, with testimonials from medical men and some who held the title of F.C.S., and he could not understand how such men could lend their names to a practice by which the public were led to believe that they were purchasing genuine cod-liver oil, whereas what they received was only about half oil. He strongly condemned such a practice, and was unanimously supported by the members in an animated discussion which followed.

The SECRETARY exhibited a sample of chiretta, falsely packed with munjeet (*Rubia cordifolia*), presented to the museum by Messrs. Evans, Sons and Co., a description of which appears in the PHARMACEUTICAL JOURNAL, 3rd Series, No. 10, page 367.

Mr. RICHARD EVANS (Cleveland Square) called attention to the correspondence which appeared lately in the PHARMACEUTICAL JOURNAL respecting poisonous feeding-bottles, and stated that six years ago, one of his children died, and upon application to the medical man who attended the child for a certificate of death, it was refused, the child exhibiting strong symptoms of having been poisoned, which symptoms he considered were produced from the use of an ordinary feeding-bottle, the white tubing, not being india-rubber, but a composition (consisting of india-rubber dissolved in 10 per cent. of bisulphide of carbon, and thickened up with white lead, resin, and sometimes oxysulphuret of antimony, to give it a pink colour), from which, when coming in contact with the milk, sulphuretted hydrogen was evolved, and lactate of lead formed in the stomach. He exhibited a feeding-bottle (which he had originally made for use in his family for some years, but at the request of many friends and medical men, he now had it for sale), the advantage of which was that the tubing and teat being formed of native rubber, vulcanized by means of magnesia, none of the evils mentioned in the other case could possibly occur. He stated that Dr. Nevins, the lecturer at the Royal Infirmary School of Medicine, had been so convinced of the value of this arrangement, that he recommended the students when they met with cases of vomiting, griping, and diarrhœa in infants, to ascertain how they were fed, and if the white tubing was used to treat the patient for lead poisoning.

Mr. A. Norman Tate, analytical chemist, stated that at the request of a medical gentleman, he had analysed some samples of tubing, and found lead in each.

Mr. Davies had tested several samples with the same result, and testified the value of Mr. Evans's suggestion from practical experience.

Mr. Edward Davies, F.C.S., read a paper upon "Ozone," of which the following is an abstract:—

When the electrical machine was invented, it was soon noticed that a peculiar odour was produced during the working of the machine. Von Marum, about a century ago, found that on passing sparks through oxygen it assumed the same smell and attacked mercury.

In this state our knowledge of ozone remained until Schönbein published his first paper on ozone in 1840, showing its production in the electrolysis of water, and afterwards in the slow oxidation of phosphorus.

Ozone can be prepared in many ways. 1st. Clean phosphorus is put into a bottle with a little water for an hour or two, then removed, and the enclosed air well washed to remove phosphoric acid. 2nd. A hot glass rod is held in a vessel containing ether vapour and air. When the rod is sufficiently heated, in the dark a pale blue lambent flame, resembling that emitted by phosphorus, is seen. If oxygen be employed instead of air, and a heated glass tube used, an explosion ensues. 3rd. By the electrolysis of water strongly acidulated; according to M. G. Plante, more ozone is obtained by using lead electrodes. 4th. By electrical discharges in air or oxygen. This method yields the largest quantity of ozone. By passing dry oxygen through Siemen's ozone generator (which is essentially a Leyden jar, the two coatings of which are connected with the terminals of an induction coil), a stream of strongly ozonized oxygen may be obtained. 5th. By the action of strong sulphuric acid on permanganate of potassium. It is also said to be produced during chemical combinations, as that of sulphuric acid with potash, in fermentation and putrefaction, and by plants when in flower.

The tests used to indicate its presence are:—1st. Paper brushed over with starch-paste containing iodide of potassium; the ozone oxidizes the potassium, and the free iodine unites with the starch. 2nd. Red litmus moistened with solution of iodide of potassium. The potash set free turns the paper blue. 3rd. Paper moistened with solution of sulphate of manganese. The paper turns brown from formation of di-oxide of manganese. 4th. Paper moistened with oxide of thallium, which turns brown owing to formation of peroxide of thallium.

Ozone tarnishes silver foil and mercury; corrodes cork and india-rubber; oxidizes indigo into isatin, ferrocyanide of potassium into ferricyanide, and destroys bad smells. Peroxide of manganese and peroxide of lead convert it into ordinary oxygen without undergoing change themselves; peroxides of hydrogen and barium also convert it into ordinary oxygen, and are decomposed into oxygen and protoxides.

Ozone possesses a powerful odour, from which it derives its name—οζειν signifying, to have a smell. It is almost insoluble in water.

Oxygen in the free state is combined with itself to form a molecule, which may be represented as $\oplus\ominus$. The view of ozone generally received is that it is $\ominus\oplus\ominus$ condensed into two volumes. This view is supported by the fact that when put in contact with iodide of potassium it does not contract. If this be so, when ozone is produced by electrical action, either both atoms of ordinary oxygen must become negative and unite with ordinary oxygen, or the molecule must split into positive and negative oxygen, and a molecule of antozone $\oplus\ominus\oplus$ be also formed. Antozone has, however, not been satisfactorily isolated, unless the fumes produced in contact with water when ozonized oxygen is passed through iodide of potassium solution consist of antozone mechanically mixed with aqueous vapour (Meissner). Williamson and Baumert considered ozone to be H_2O_3; but this view seems disproved by the experiments of Andrews.

Ozone is found generally in the air, Dr. Richardson says that the amount may be $\frac{1}{10000}$. It is absent generally in large towns, especially in close courts. It is doubtful if it produces disease, though catarrh may be a result of excess, as it produces the symptoms of that disease when inhaled. Equally uncertain is the action which it exerts in preventing disease. According to some observers the occurrence of cholera is coincident with absence or diminution of ozone, and its departure with a return of ozone. Against this view must be set the observations of Father Denza, that in Turin during cholera the amount of ozone remained an average quantity, and of M. Fournet, that at Lyons, where no ozone can ever be detected, cholera is not more frequent or severe than elsewhere.

Many of the discrepancies observed may be due to the method used for measuring the amount of ozone. This, consisting in the use of iodide of potassium and starch papers, is liable to many sources of error. Many other substances will set iodine free besides ozone, and the tendency of free potash to convert free iodine into iodide and iodate of potassium, must have some influence on the delicacy of the test. Until some more certain means is discovered, present observations must be received with great caution, or the knowledge which we possess will be worse than ignorance, as being calculated to mislead.

The methods for preparing ozone, and the various tests for it mentioned by Mr. Davies, were fully and ably illustrated by many very successful experiments.

The President said that at the *soirée* of the Pharmaceutical Society an apparatus was exhibited for producing ozone in large quantities.

A discussion followed, in which Messrs. Tate, Wright, Blair and Samuel took part.

Mr. A. Norman Tate said he was very glad to hear Mr. Davies close his valuable paper as he did. He had always avoided ozone, as he considered the knowledge that chemists had of it was worse than ignorance, as ozone was often said to be present when other things might exist. He complimented Mr. Davies on his concentration of the subject, and moved a vote of thanks.

Mr. Blair, in seconding the vote, said that when ozone was absent cloth goods would not dye, and instanced the remarkable effect of a thunderstorm, during which the power of the mordant was increased, and the stuff was dyed. In the island of Skye ozone was very abundant, and the people never suffer from catarrh. He considered also that if ozone could be produced in quantity at a reasonable rate, it would be of great service to decolorize sugar.

The vote having been carried by acclamation, Mr. Davies returned thanks, and the meeting separated.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT LIVERPOOL.

Wednesday, September 14th.

(*Continued from page* 418.)

NEPAUL ACONITE.

BY T. B. GROVES.

It had been my intention to furnish the Conference with a general view of the recent researches of Professors Flückiger and Klebs on the aconite bases, but for several reasons I now abstain from doing so. In the first place, Professor Flückiger has himself communicated to the PHARMACEUTICAL JOURNAL a *résumé* of his long and able paper, and secondly, poor Professor Klebs, to whom had been entrusted the physiological portion of the inquiry, having been prevented by illness from elaborating his notes on the termination of the experiments, has now been ordered to the front as a military surgeon, leaving his manuscripts unaccessible, and nothing further published respecting his labours than is to be found in Professor Flückiger's paper already alluded to. I much regret this delay, as I should attach the first importance to such method of testing in the case of substances so ill-defined chemically, so susceptible of modification in the process of extraction, and withal so immensely powerful in their action on the living body, as are the group of aconite alkaloids.

Flückiger's motive in undertaking his investigation was a desire to determine whether or no there were at the present time two different aconitinas supplied to the medical profession, and if so, in the second place to determine exactly their respective characteristics, and lastly, to ascertain the source from which each alkaloid was derived.

In the first and second parts of the subject, he was highly successful, and pharmaceutists are greatly indebted to him for establishing indubitably the fact that there are both aconitina and pseudaconitina. As regards the source of the latter, he regrets his inability to settle the moot question, whether it owes its origin to the Indian aconite roots known under the name of Bikh, or not. Von Schroff early declared that such was the case, and that he had extracted from Bikh roots an alkaloid he regarded as the acrid principle of aconite, as distinguished from the narcotic principle represented by German aconitina. But he unfortunately identified this acrid principle with Morson's aconitina, which substance Flückiger was able to prove identical with the German article, and moreover, that it for many years had not perceptibly altered its character. Flückiger's examination of Bikh, limited to the physiological testing of an extract of that root, pointed to the conclusion that it contained aconitina, not pseudaconitina. It will be well here to read a summary of Flückiger's conclusions.

1. Aconitina is found in the roots of the European blue-flowered aconites, especially *A. Napellus.*

2. It is also found in the Himalayan species that go by the name of Bikh, amongst which occurs *A. Napellus,* sp.

3. According to Hübschmann aconitina is wanting in *A. Lycoctonum,* the yellow-flowered aconite.

4. Aconitina is characterized by the following properties. It softens in boiling water, and imparts to phosphoric acid that has been concentrated by heating over a water bath at from 80° to 100°, a violet tint that in the cold lasts for whole days. Its watery solution tastes bitter, not acrid. It is not precipitable by chloride of platinum. Soluble in 5 pts. sp. v. r. (75 p. c.), also soluble in ether and chloroform. It fuses completely at about 120°. Its nitrate crystallizes well, the free base not so distinctly.

5. The above description (par. 4) applies generally to English aconitina, except that occasionally an acrid taste accompanies the bitter.

6. Hence the term "English aconitina" is not distinctive.

7. There is found among the varieties of aconitina an entirely different basic body, of unknown origin. A conjecture may be hazarded that it is derived from the Indian Bikh roots.

8. It is here referred to under the name pseudaconitina. Its discoverer, Von Schroff, however, called it English aconitina. Other chemists have termed it napellin, nepalin, acraconitina.

9. Pseudaconitina does not soften in boiling water, does not give the violet colour with phosphoric acid, tastes acrid not bitter, does not dissolve in water, is little soluble in ether, chloroform and sp. v. r. in the cold, crystallizes readily in large prisms from boiling saturated solutions in the above.

10. Napellin proper is an alkaloid distinct from the above alkaloids.

11. Lycoctonin is likewise a distinct alkaloid, and is exceedingly well characterized by the behaviour of its watery solution with bromine water and iodohydrargyrate of potassium.

Equally striking is the quickness with which cautiously melted lycoctonin, after completely cooling, becomes reconverted by moistening with water into crystals.

I am happy to be in a position to throw considerable light on the source of the long-sought pseudaconitina.

When last in London (in August last) I ascertained from our esteemed ex-president, Mr. D. Hanbury, that there had been a large importation of Indian aconite roots, and that they were obtainable at an exceedingly low price. They were represented as coming from Nepaul, but whether they were the produce of *Aconitum ferox*, or of some other aconite, was not ascertainable. I at once determined on testing the nature of the alkaloid or alkaloids they might contain, and procured from Messrs. Barron, Harveys and Co. a supply of the roots, for which I paid the absurd price of 8*d.* per lb. I say absurd, for I have it on record in my price-book that when, some years since, I asked for a quotation of price of *Aconitum ferox*, I obtained the answer 22*s.* per lb.!

Six pounds of these roots I treated after the method explained in my paper on aconite, read before this Conference at Nottingham in 1866. I need not, therefore, repeat its details. Of the roots themselves I exhibit some characteristic specimens. In texture they differ much from English aconite roots. They are often tough and leathery, so that they are difficult to powder, even after considerable exposure in the drying closet. These refractory roots are, when completely dry, hard and flinty. It appears that, in these cases, starch has become converted into dextrine. In fact, on tearing a root, the broken edge appears inclined to transparency, exhibiting a sort of waxiness. That this was not due to an unusual proportion of resin was evidenced by the result of my analysis, which showed that the Bikh roots were less resinous than the English roots I had previously operated upon.

Omitting mention of the earlier processes, I will commence detail at the point when the alkaloids had been concentrated into a crude acid solution, measuring about 6 ounces.

This solution, first partially decolorized with animal charcoal, was transferred to a separating funnel and alkalized with ammonia. It became nearly solid; and I was at once aware of the extraordinary richness of the material I was treating. Washed repeatedly with ether, the magma disappeared. After each ethereal washing, the ether was shaken with acidulated water, and used over again. The acid solution thus obtained was again treated with ammonia and ether. Care was taken to contract the bulk as far as possible; and the ether, loaded with alkaloids but yet scarcely coloured, was put aside for spontaneous evaporation. After about half an hour, white, shining crystals began to make their appearance. These increased from day to day, until the mother-liquor had become syrupy. They were then removed, washed

with ether, and dried on blotting-paper. Examined chemically, they correspond in every respect with Flückiger's description of pseudaconitina. They weighed 43 grains.

The syrupy mother-liquor, evaporated to dryness in a tared capsule, weighed 130 grains, without reckoning what was temporarily lost in the washings. It had the appearance of resin, became soft over the water-bath; when cold, was brittle and structureless. It was dissolved in alcohol, and the solution poured *guttatim* into boiling water kept slightly acidulated with nitric acid. It dissolved without residue. The solution was concentrated to a thin syrup, and set aside to see whether it would crystallize. It showed no tendency that way, in this respect differing from the alkaloid of *Aconitum Napellus*, so it was diluted with water, and treated with a slight excess of ammonia. The white magma was thrown on to a filter, washed a little with water, then drained on blotting-paper and dried. It weighed in that condition 87 grains.*

The loss occasioned by precipitation thus amounted to 43 grains. This was caused mainly by the solubility of aconitina in water. It is stated to dissolve in 150 parts of that fluid, but that proportion is much too little for the recently precipitated alkaloid and an ammoniacal liquor. To avoid loss, therefore, the wash waters and absorbent papers must be looked sharply after.

It is, therefore, probable that the pseudaconitina that from time to time has made its appearance in the European markets, under the name of aconitina, has been derived from the Indian aconites, of which it seems to be characteristic, as lycoctonin is peculiar to the yellow-flowered aconite. The very large proportion of true aconitina yielded by Bikh, and the facility of purifying it from its crystalline and sparingly soluble concomitant, point unmistakably to the future source of the alkaloid, and to a large reduction of its present enormous price.

Note on Calamine.

BY R. REYNOLDS, F.C.S.

It has been supposed that those who desired the genuine calamine of pharmacy (prepared carbonate of zinc) could obtain such from a manufacturer in Derbyshire. Although this used to be the case, it is so no longer, as the calamine issued from the above source is now a silicate of zinc (the electric calamine of mineralogists) and not a carbonate. The maker appears to be satisfied, because the mineral contains about 70 per cent. of oxide of zinc, and the substitution seems to be the result of difficulty in getting the right substance, and not from any fraudulent intention. However, the fact is not a satisfactory one, and some other means of supply is desirable. The silicate is easily distinguished from true carbonate, inasmuch as it partially dissolves, without effervescence, in hydrochloric acid, and then gelatinizes, from the separation of silica.

The President confirmed the statement of the difficulty in obtaining genuine calamine. He was able, however, to announce that a recent discovery of this ore had been made in the Mendip Hills, which he hoped would soon be made available for the purposes of pharmacy.

Mr. Williams (London) also spoke of the absence of genuine English calamine from the market, but said that a satisfactory article was imported from Belgium.

Mr. Wentworth Lascelles Scott, F.C.S., furnished a paper on "The Purification of Ammoniacal Salts from Gas Liquor so as to utilize them for Pharmaceutical

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* Since writing the above, I have had an opportunity of ascertaining the opinion of Dr. Th. Husemann respecting pseudaconitina and aconitina, expressed in a paper published subsequently to that of Dr. Flückiger in the *Neues Jahrbuch der Pharmacie.* He writes, "The physiological actions of pseudaconitina and of aconitina, when applied externally, differ in this respect—the former acts similarly to veratria, the latter not so. Taken internally, pseudaconitina is given in much smaller doses than aconitina and often acts fatally. They both depress the action of the heart and lungs, and act similarly but unequally on the bowels."

Adelheim, however, could perceive only a difference of degree, not of kind, between aconitina and pseudaconitina derived from *Aconitum ferox.*

Very soon after Turnbull's discovery of aconitina, and its introduction into medical practice, differences in the action of alkaloids of various sources were noticed. Some would not produce the sensation of numbness, contraction and weight, lasting from two to twelve hours, as described by Turnbull; some were stronger than others; some dilated, others expanded the pupil. From 5 to 6 milligrams of the stronger kind seem to have been the poisonous dose for a cat, whereas the weaker kinds were toned down step by step to almost positive inertness.

Husemann is decidedly of opinion that pseudaconitina ought not to be regarded as a mere impurity of aconitina, but rather as the true active principle of aconite, and thinks that both alkaloids deserve a place in the dispensary as soon as a method shall have been devised for preparing them in a state of purity.

He regards the Indian aconite roots as the most likely source of pesudaconitina, although he thinks it probable that *Aconitum Napellus* may possibly contain it in small quantity.

Morson's preparation, it is well known, cannot always be relied upon. Its topical action is at times much more powerful than at other times. The method of extraction adopted by him is not known. It is said to be a peculiar one; but there is reason for supposing that its success depends more on careful selection of the roots than on any refinement of chemical treatment.

Purposes," which was a continuation of his paper of last year on the same subject.

The next paper was by the same gentleman, and was entitled a "Report on the Purity of Commercial Salts of Lithium." The author had examined twenty-seven samples, obtained from different sources. Of these sixteen were found to be pure, six showed signs of extraneous matter, and five were adulterated to a greater or less extent, a result which the author thought on the whole to be satisfactory.

Mr. Williams remarked that some carbonate of lithium had been met with that contained 60 per cent. of carbonate of sodium.

Mr. Atherton (Nottingham) moved the following resolution:—

"That the best thanks of the Conference be given to the authors of papers read before it."

Mr. H. S. Evans seconded the resolution, which was heartily carried.

Mr. Carteighe said he had been permitted the privilege of moving the following resolution:—

"That the cordial thanks of the assembled members be presented to their brethren of Liverpool and the neighbourhood, especially to Messrs. Abraham, Sumner, Shaw, Davies, and the other members of the Local Committee, for their great and successful efforts in organizing the Exhibition, making arrangements for the meetings, and promoting the general objects of the Conference, as well as for the hospitable reception they have accorded to their visitors."

He begged to assure the Chairman and all the gentlemen on the Local Committee that this resolution expressed, though feebly, the *real* feelings of all the visitors, and that they were not only thoroughly conscious of the large expenditure of time and money required in organizing their Exhibition of singular excellence, but also deeply sensible of the personal kindness and hospitality displayed with so much continuity by their Liverpool friends. He was convinced the resolution would be received with all the acclamation that it deserved.

Mr. Savage (Brighton) seconded the motion.

Dr. Attfield said that he could not allow the resolution to pass without adding his testimony to the excellence of all the arrangements which had been made by the Local Committee. The Chairman, Mr. Abraham, and the Local Secretary, Mr. Davies, had shown every anxiety to ascertain what steps would be most conducive to the success of the meeting, and these were in all cases carried out promptly and efficiently. The wishes of the officers of the Conference had been completely anticipated by the Local Committee.

The resolution was carried amid hearty cheering.

Mr. Abraham acknowledged the vote of thanks, and expressed his satisfaction that their arrangements had met with the approval of their friends. A knowledge of this and the kind way in which it had been now expressed was an ample reward for any exertions which they had made.

Mr. Shaw replied, and said that they had, during twelve months, looked forward with pleasure to the meeting which had now been held. His post as Treasurer of the Local Committee had brought him into contact with the members of the trade generally, and all were anxious that a suitable reception should be given to the Conference.

Mr. Davies also replied, and received from the meeting a very cordial and well-deserved recognition of the admirable way in which he had performed the onerous duties of Local Secretary.

Mr. Savage moved, and Mr. Mackay seconded a vote of thanks to the Treasurer and General Secretaries.

Mr. Williams moved, and Mr. Shaw seconded a vote of thanks to the President, which was put to the meeting by Mr. Abraham, and warmly received. The President acknowledged the vote.

Closing Business.

Tuesday, September 20.

The Conference met at 10 A.M.; Mr. Abraham, Vice-President in the chair. He said that the first business to be considered by the meeting would be some proposed alterations in the rules.

It was then proposed by Mr. Carteighe, and seconded by Mr. H. Matthews,—

"That Rule 1 be altered as follows:—Any person desiring to become a member of the Conference shall forward his name to the General Secretaries, and be balloted for at a general meeting of the members, two-thirds of the votes given being needful for his election. If the application be made during the recess, the Executive Committee may elect the candidate by a unanimous vote."

Mr. Redford expressed an opinion, in which Mr. Davies concurred, that there should be no restrictions upon the admission of members to the Association, but that it should be thrown open to all.

Mr. Savage thought that the right of demanding a ballot should be retained.

Mr. Atherton thought the Executive Committee should have the power to reject a candidate.

Mr. Horton asked whether there was any rule about expulsion? He would also like to know how often the Executive Committee met?

Mr. Reynolds said that any member whose subscription was more than two years in arrear, after written application, was liable to be removed from the list by the Executive Committee. Members might be expelled for improper conduct by a majority of three-fourths of those voting at a general meeting, providing that fourteen days' notice of such intention of expulsion were sent by the Secretaries to each member of the Conference. The Committee met whenever there was any business to transact.

Mr. Redford suggested that a list of candidates for membership should be posted to the members every three months.

Mr. Sumner suggested that each candidate should be nominated by a member residing in the same locality.

Mr. Robbins thought that persons on the Register of Chemists and Druggists should be entitled to membership without election; all others should be elected.

An amendment was then proposed by Mr. Savage, and seconded by Mr. Robbins,

"That all members registered as chemists and druggists, on payment of the annual subscription, be freely elected; but all others not so registered shall either obtain the signature of the local treasurer, or be subject to the veto of the Executive Committee."

This, upon being put to the vote, was lost.

Another amendment was moved by Mr. Davies and seconded by Mr. Dutton,—

"That any person desiring to become a member of the Conference shall forward his name and address to the Treasurer, with subscription for the current year."

Mr. Sumner asked what scrutiny the Executive Committee could exercise in the case of candidates living at a distance.

The amendment was then put to the vote and rejected.

The original resolution was carried unanimously.

The following alteration in Rule V. was proposed by Mr. Groves, seconded by Mr. Savage, and carried unanimously,—

"The officers of the Conference shall be a President, four elected Vice-Presidents, all past Presidents, who shall be Vice-Presidents, a Treasurer, two General Secretaries, one Local Secretary and nine other Members, who shall collectively constitute the Executive Committee. Three members of this Executive Committee to retire annually by ballot of the annual meeting, the remainder being eligible for re-election

The Executive Committee shall be elected at each annual meeting by ballot of those present."

Upon the proposition of Mr. EVANS, seconded by Mr. ATHERTON, it was resolved unanimously,—

"That the invitation to hold the next meeting of the Conference in Edinburgh, in August, 1871, be accepted."

Upon a ballot being taken, the following were declared to be the retiring members of the Executive Committee:—Mr. S. C. Betty, Mr. Cooper, and Mr. J. T. Robinson.

It was proposed by Mr. ATHERTON, seconded by Mr. WILLIAMS, and carried unanimously,—

"That in consequence of the large increase in the number of members, the Executive Committee be recommended to appoint a paid agent as Assistant-Secretary and Sub-Treasurer."

The ballot for officers for 1870–71 was then taken; the Chairman declared the result to be as follows:—

President.

W. W. STODDART, F.G.S., F.C.S.

Vice-Presidents who have filled the office of President.

H. DEANE, F.L.S.
Professor BENTLEY, F.L.S., M.R.C.S.
D. HANBURY, F.R.S., F.L.S., F.C.S.

Vice-Presidents.

J. ABRAHAM, Liverpool. | J. INCE, F.L.S., F.C.S.
H. C. BAILDON, Edinburgh. | J. WILLIAMS, London.

Treasurer—G. F. SCHACHT.

General Secretaries.

Professor ATTFIELD, PH.D., F.C.S.
R. REYNOLDS, F.C.S., Leeds.

Local Secretary.—J. MACKAY.

Committee.

F. B. BENGER, Manchester.
H. MATTHEWS, F.C.S., London.
M. CARTEIGHE, F.C.S., London.
G. BLANSHARD, Edinburgh.
T. B. GROVES, F.C.S., Weymouth.
W. MARTINDALE, London.
E. DAVIES, F.C.S., Liverpool.
H. B. BRADY, F.L.S., F.C.S., Newcastle-on-Tyne.
F. SUTTON, F.C.S., Norwich.

It was proposed by Mr. SUMNER, seconded by Mr. BOURDAS, and carried unanimously,—

"That Mr. H. S. Evans and Mr. J. F. Robinson be elected Auditors for the present year."

It was proposed by Mr. ROBBINS, seconded by Mr. EVANS, and carried unanimously,—

"That a grant of books, of the value of ten guineas, be made from the Bell and Hills Fund to the Library of the Liverpool Chemists' Association."

The President of the Liverpool Chemists' Association thanked the Conference, on behalf of the Association, for the gift, and said that their Library now amounted to about six hundred volumes.

It was proposed by Mr. MATTHEWS, seconded by Mr. BOURDAS, and carried unanimously,—

"That the best thanks of the Conference be presented to the Committee of the Liverpool Royal Institution for the use of its rooms for the meetings of the Conference."

It was proposed by Mr. MARTINDALE, seconded by Mr. WILLIAMS, and carried unanimously,—

"That the best thanks of the Conference be tendered to the Trustees and Managers of the Liverpool Savings Bank for the use of its rooms for the Exhibition of Objects relating to Pharmacy."

A vote of thanks having been accorded to the Chairman, the proceedings terminated.

MEETING FOR THE ENSUING WEEK.

THURSDAY, *London Chemists' Association*, at 9.30 P.M.—"On Hypophosphites." By Mr. R. JEWELL.

Parliamentary and Law Proceedings.

DOUBLE SUICIDE BY CYANIDE OF POTASSIUM.

An inquest was held on Wednesday, Nov. 16, at Redhill, upon the bodies of Robert Walker and Helen Mason, who had been found dead. A document, signed by both the deceased, in which they expressed their intention to commit suicide, was produced.

W. Mills, in the employ of Mr. Padrick, chemist, Warwick-town, said the deceased man came to his employer's shop on Friday night, and asked for two pennyworth of prussic acid to clean gold lace, which he refused to give, as by the new Act of Parliament a witness was required. The man called again in about a quarter of an hour, accompanied by James Crouch, a person known to witness, and he was then served with half an ounce in its crude state.

James Crouch, gardener, said that while he was looking into Mr. Padrick's window the man asked him to go in as a witness. He said he did not mind if there was no harm. He then went in and signed the book as a witness. He never saw the man before.

Dr. Hallowes said he had no doubt cyanide of potassium, which contains prussic acid, was the cause of death. Three grains would be sufficient to destroy life. He thought it was most likely taken in a crude state, and that death ensued in four or five minutes after taking it.

Evidence was given, showing that both the deceased were very peculiar in their manner. The jury returned a verdict "That the deceased destroyed themselves while in an unsound state of mind." They also censured the man Crouch for signing his name when he did not know what it was for, and the coroner refused him his expenses.—*Times.*

Obituary.

WILLIAM M'CONNELL, a prominent member of the Canadian Pharmaceutical Society, died on the 28th of September from the effects of a railroad accident, after lingering for ten hours. He resided at Coburg, and has left a widow and four children.

Poisoning of a Family by Sheep-Dipping Composition.—A case of poisoning of a family consisting of a farmer, his wife and their son, showing a large amount of carelessness in dealing with poisonous washes, is reported in the *Leeds Mercury* as having occurred near Driffield. Three ounces and a half of mercury had been purchased by the son for the purpose of making a sheep-wash, which he prepared over the kitchen fire in the evening. When the mercury was sufficiently dissolved, it was removed from the fire, poured into a tin vessel and placed under the kitchen table, where it remained during the night. Next morning the servant went to fill the kettle for breakfast, and did so from the tin vessel containing the mercurial preparation, mistaking it for one she had been in the habit of using. From this mixture coffee was prepared, all three partaking of it. Strong symptoms of poisoning were immediately manifested, and medical assistance was obtained, but in spite of every effort the father died on the following day, after suffering great agony.

The following journals have been received:—The 'British Medical Journal,' Nov. 19; the 'Medical Times and Gazette,' Nov. 19; the 'Lancet,' Nov. 19; 'Nature,' Nov. 17; the 'Chemical News,' Nov. 18; 'Journal of the Society of Arts,' Nov. 17; 'Gardeners' Chronicle,' Nov. 19; the 'Grocer,' Nov. 19; the 'English Mechanic,' Nov. 18; the 'Produce Markets Review,' Nov. 19; the 'Chemist and Druggist' for November; the 'Chemists and Druggists' Advocate' for November; the 'Chicago Pharmacist' for October; the 'American Journal of Pharmacy' for November.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[26.]—DOSE OF CHLORAL HYDRATE.—The dose of chloral hydrate varies very much as to quantity. In a patient this week, to whom I prescribed it, 50 grains had no effect; but by pushing it to 75 grains, excellent and most invigorating sleep was procured.—CHARLES KIDD, M.D.

[29.]—QUININE MIXTURE.—If *A. P. S.* will try ext. cinchonæ liq. B. P. with sarsaparilla, he will probably be more successful than with quinine alone; the following produces an elegant mixture:—

Decoct. Sarsæ Co. Conc. 5 parts
Ext. Cinchon. Liq. B.P. 2 „
Sp. Vini Rect. . . . 3 „
Tinct. Quinæ Co. . . 2 „
Syr. Aurantii . . . . 4 „
Mix. Dose ʒi to ʒij, in water.

If dandelion be desired, some of the succus tarax. B. P. may be added, but then the mixture is not quite clear.—J. H. BALDOCK, *S. Norwood.*

[33.]—DISPENSING.

℞. Tinct. Quiniæ Co. ℥iss
Ammon. Carb. gr. l
Syrup. Aurantii ʒss
Aquæ ℥j.
M. ft. mist.

Mix the tinct. quinæ co. and syr. aurantii. Dissolve the ammon. ses. carb. in the aqua, and add this last *to* the tincture; an opalescent mixture is obtained, but no appreciable precipitate, which is *not* the case if the conditions be reversed. In either case, however, a thick mixture, with deposition of quinine, is the ultimate result.—J. H. BALDOCK, *S. Norwood.*

[35.]—ROSE TOOTH POWDER.—Add ℈i of carmine to each pound of precipitated chalk, *well rubbing* it with a little of the chalk first. The more it is rubbed, the more the colour is developed.—J. H. BALDOCK, *S. Norwood.*

[36.]—EAU DE COLOGNE.—*B. Shakerley* (Liskeard) will find the following a good recipe for making Eau de Cologne:—

℞. Oil Bergamot ℥iij
„ Lemon ℥ij
„ Lavender ʒiiiss
„ Neroli ʒiiss
„ Thyme ʒij
„ Rosemary ʒj
Ess. Vanilla ʒij
Otto of Rose gtt. xxxiv
Ess. Patchouli ʒj
Musk gr. x
Orange Flower Water Oj
Rectified Spirit of Wine Oxiij

Macerate for fourteen days and filter.—J. F., *Aberdeen.*

[38.]—SOLUBILITY OF CITRATE OF IRON.—In answer to *J. L.* (Birmingham) *T. H.* (Bideford) writes,—"I frequently have to make up prescriptions, written by an eminent physician of a neighbouring town, in which citrate of iron is ordered; but as I never allow any in my shop to substitute one medicine for another, and knowing how little soluble citrate of iron is in cold water, I always have it put into a test-tube with distilled water and dissolved over the gas, which only takes a short time, and then forms an elegant mixture."

[42.]—CHILBLAINS.—In answer to "*Lugoney*" and *C. Bennett*, "*Utile*" (Boston) says that the following makes an excellent chilblain lotion:—

℞. Glycerine ℥iij
Arnica Root ℥j
Spirit of Camphor ℥ss
Rose Water ʒj. M.

Directions—To be well rubbed in night and morning.

Dr. Dewar's lotion—

℞. Sulphurous Acid,
Glycerine, each ℥j
Distilled Water ℥ij. M.

—*Chemists and Druggists' Almanack*, 1869.

A solution of chloride of ammonium, variously disguised, is also used.—H. H. P.

[44.]—PERFUMES.—In answer to "*Chemicus*," who requires a good, cheap, lasting perfume, "*Utile*" sends the following:—

℞. Ylangylang,
Ess. Bouquet, each ℥iv
„ Millefleurs ℥ij
„ Patchouli ʒij. M.

[46.]—WEATHER-GLASS.

℞. Nitrate of Potash,
Sal Ammoniac, each ʒss
Camphor ʒij
Rectified Spirit of Wine ℥ij. M.

This composition to be put into a bottle 8 or 10 inches in length and about ¾-inch in diameter, and the mouth covered with perforated bladder.

The following are the changes which may be observed:—

If the weather promise to be fine, the insoluble matter will settle at the bottom of the tube, while the liquid remains pellucid; but previous to a change for rain, the compound will gradually rise, the fluid remaining transparent.

Twenty-four hours before a storm or very high wind, the substance will be partly on the surface of the liquid, apparently in the form of a leaf, the fluid in such case will be very turbid and in a state resembling fermentation.—W. J. WATKINSON, *Preston.*

[51.]—BRILLIANTINE.

Honey ℥j
Glycerine ʒss
Eau de Cologne ʒss
Rectified Spirit of Wine ℥ij.

—*Chemists and Druggists' Almanack*, 1869.

The following is another formula:—

Castor Oil, 2 parts
Absolute Alcohol, 6 parts.
Scent with otto of rose.

[55.]—OIL AND COTTON CAKE.—*D. Jenkins* (Bridgend) wishes to know the best form of giving oil and cotton cake.

[56.]—HAIR WASH.—"*Alumen*" (Bayswater) asks for a formula for a good inexpensive hair wash, one that will have a clean appearance.

[57.]—FLORIDA WATER.—"*Nemo*" (Sudbury) will be glad if any of our readers can give him a recipe for Florida water, or tell him where to procure it.

[58.]—WALNUTS.—What is the best method for keeping walnuts in good condition?—IODI.

[59.]—DISPENSING,—What is the best way of preparing the enclosed prescription? I have prepared it several times, but with a very peculiar result, a copious black precipitate being thrown down.—MAGNESIA.

℞. Quinæ Sulph. gr. xij
Ferri Sulph. gr. xij
Magnes. Sulph. ℥iss
Tinct. Zingiber. ʒiss
Aquæ ad ℥vj
M. ft. mist.

A tablespoonful in water twice a day after food.

[60.]—CHEMICAL CABINETS.—How does the Pharmacy Act affect the sale of chemical cabinets? They mostly contain one or two chemicals, such as sulpho-cyanide of potassium, corrosive sublimate, or prussiate of potash, which come within Part I. of the Schedule A. of the Poisons Act, and require registration before sale, and yet this, I think, is never done. I am anxious to know if I can bring out a new chemical cabinet which should contain the above.—E. J. B.

[*** It would not be legal to sell poisons in chemical cabinets, except in accordance with the provisions of the Act. Sulphocyanide of potassium and prussiate of potash are not poisons.—ED. PH. J.]

Correspondence.

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

Obscure Prescriptions.

Sir,—I forward a copy of another peculiar prescription also bearing the signature "Watson Bradshaw." I was informed it had been dispensed without difficulty at the pharmacy of Mr. Wilkinson, Regent Circus, Oxford Street.

I should be obliged if he or some other correspondent would state in your columns what recognized preparations are indicated by the names written in this prescription.

A Puzzled Druggist.

London, 15th Nov. 1870.

43, *Welbeck Street, Cavendish Square, W.*
Nov. 15, 1870.

Sir,—A respectable chemist in my vicinity has just handed to me for my amusement, I presume, a copy of your serial of Nov. 12th. I find therein a letter from a correspondent who styles himself as "Major Associate." I am not finding fault with your remarks, which I consider very appropriate, and I shall not condescend to offer any observations on the "animus lividus et mordax" which must have animated the writer; but I certainly must be permitted to think that in the columns of a justly influential Journal like yours, it is unwise, nay, unfair, to associate the name of a Physician with such a vile specimen of Latinity as that I find inserted in connection with myself.

Your correspondent ought to know that if he aspire to any "honour," which a Society of your reputation is calculated to confer, that he is shedding no lustre on himself or his fraternity by making such gross blunders as he has sought to fasten upon me.

I simply write this, lest any respectable reader might espouse the belief that I really was the 'Ipse Auctor' of the vile Latinity in question. The errors are so flagrant that I think the writer ought to blush for his own ignorance and temerity.

For *Cinerii* read *Cinerei.*
For *Hebdomadæ* lege *Hebdomadâ.*
For *Alkalinæ* read *Alkalini.*
For *Amaræ* read *Amari.*

I beg utterly to deny ever having indited such barbarous Latin as that imputed to me, and remain,

Yours faithfully,
Watson Bradshaw,
Formerly Surgeon H.M. Royal Navy.

43, *Welbeck Street, Cavendish Square, W.*
Nov. 20, 1870.

Sir,—You have not only omitted to insert my letter, wherein I repudiated the Authorship of a Prescription full of false Latinities; but you have absolutely, in defiance of my carefully-couched protest, suffered your columns to be made the ready vehicle of a repetition of such injustice.

Understand, Sir, I consider it infinitely 'infrà dig.' to enter the arena with such correspondents as yours appear to be, and condescend to dissert upon the squabblings of silly druggists; but when I find my name is so unblushingly paraded in your Journal, in such a mode as to serve merely to excite the cachinnations of a few ignorant readers, by identifying me with Incorrect Latinity, it is time that I should take up arms, and emphatically remind you that you are immeasurably transgressing the license of all tolerable Journalism. What right do you conceive yourself to possess to make use of my name in a private matter between my patients and myself?

My patients are invariably reminded that they can only have their medicines compounded by the especial druggists, to whom I hand them over.

I have a perfect personal right, and shall continue to exercise it whenever I think proper, of inditing my prescriptions in any mode I may deem expedient, without the risk, I should think, of subjecting myself to the Censorship of a posse of angry druggists.

You are widely over-rating your legitimate sphere of action if you consider that you have a right to dictate to the Medical Profession how they should conduct their own private affairs.

You have no right whatever to interfere with Medical Men, much less to allow your correspondents to take their names in vain.

You have been guilty of an actionable offence (Constructive Libel) in having twice allowed my name to appear in your columns under a false and invidious guise. I will not retread the ground (see last letter), but, having counsel's opinion on the subject, I have to inform you that unless you do me all just reparation for the unwarrantable manner in which my name has introduced into your columns, I shall direct my solicitor to institute immediate legal proceedings.

I beg to observe, finally, that you have no moral or legal right to make use of my name under any pretext whatever.

Your obed^t^ ser^t^
Watson Bradshaw,
Formerly Surgeon H.M. Royal Navy.

*** We are sorry Mr. Watson Bradshaw considers our publication of the prescriptions an injustice to him. They were printed exactly according to the copies sent by our correspondents, but we were informed that the writing of the originals was difficult to decipher.

The letter of our correspondent *F. J. B.* affords internal evidence of his freedom from personal animus in asking for an explanation of a prescription he could not understand. Probably he did not know of the existence of Mr. Watson Bradshaw, and was as little concerned as ourselves whether his Latinity be classical or "vile."

That was not the point to which attention was directed, and Mr. Watson Bradshaw is entirely mistaken in supposing any question raised as to his Latinity.

The difficulty experienced by *F. J. B.* was of a totally different nature, and, as we think, one much more serious. How was he to dispense an unintelligible prescription? How to convince his customer that his inability to dispense it was not a result of incompetence, but was, as it now appears from Mr. Watson Bradshaw's letter, due to a proceeding by which that prescriber limits the compounding of his patients' medicine to certain druggists?

Had the name of any particular druggist been indicated on the prescriptions, perhaps no difficulty would have arisen; but this does not appear to have been part of the system by which Mr. Watson Bradshaw hands his patients over to especial druggists, for notwithstanding his reminding patients of this fact, we find that his prescriptions are taken to other druggists, in distant parts of the country to be dispensed.

Though we have not offered any comment on the practice of writing prescriptions in such a manner as not to be generally intelligible to pharmacists, we believe we should be justified in expressing an opinion on a matter so closely connected with pharmacy, and that, in doing so, we should not be considered "to dictate to the medical profession."

However, we are enabled to show, as a matter of fact, that such a practice is dangerous, by a case that has come under our notice, in which a prescription, similar to those published and written in unusual terms, was actually dispensed in a country town, remote from the prescriber's residence, much in the same manner as a hieroglyphic inscription might be translated; the medicines thus administered on speculation being, among others, the extracts of henbane and belladonna and a preparation of mercury. A proceeding so fraught with danger to the patient was unquestionably improper on the part of the dispenser, but the fact must not be overlooked that a large share of censure is due to the writer of the prescription, in so far as he furnished the druggist with a provocation to go beyond his legitimate sphere of action, in order to meet the wants of a customer under circumstances which rendered a reference to the prescriber impossible.

Mr. Watson Bradshaw's remarks do not touch this point, and it is solely in the wish to afford him full publicity that we give space to his letters, by which it appears that from having regarded this Journal as a source of amusement, he now makes it an object for scolding. At the same time, to avoid any ground for suspicion that we desire to misrepresent his Latinity, we publish a *fac simile* of one of his prescriptions which may also account for the difficulty experienced by *F. J. B.* in deciphering the one he sent us a copy of.—Ed. Ph. J.

For Mr Ackroyd — For 10 days

℞ Pulv: Cinnam gr i
Ext: Laxativ gr iss
Ft pil: bis hebdomada sumenda — Cap 1

℞ Acidi [illegible] ℨi
Ext: [illegible] gr i
Inf: Amar ℥viij
[illegible] M: Pil: [illegible]
Mist: Amara ℨi
Ft a post [illegible] sumenda
ter in die

Dat 4 Dec 1867 W. [illegible]

Pharmacy in Ireland.

Sir,—Taking advantage of the invitation you kindly offer Irish chemists and druggists, to express in the columns of your Journal their opinions on the proposed Pharmacy Bill for Ireland, I would submit a few reasons why we, the Chemists and Druggists of Ireland, who are likely to come under its immediate influence, decidedly object to it.

Primarily we object to it because it is not in accordance with the tenor of the Pharmacy Act of 1868—an Act which we deem every well-wisher of Pharmacy would like to see made general over the three kingdoms, or, if this is not found possible, that at least the Irish Bill should be in as close harmony with the other as circumstances will admit.

Now, the proposed Bill does not make any advance towards attaining this object, but, instead, makes a retrograde movement and endows with supreme power a body of men whose influence on pharmaceutical matters the Bill of 1868 curtailed and endeavoured to eradicate,—I mean the medical profession.

We do not seek to deny that they ought to have an important voice in the matter, but to give apothecaries supreme control over Irish pharmacy is a principle running right in the teeth of pharmaceutical advance, and will prove an insuperable obstacle towards assimilating English and Irish legislation on the subject. We have now a British Pharmacopœia, why not endeavour to obtain a British Pharmacy Act?

Again, is there any satisfactory reason why an individual who in England is a pharmaceutical chemist under the Act of 1868 should, when he removes over to Ireland, be denied the privileges of compounding and dispensing medicines, simply because he does not bring with him the diploma of the Governor and Managers of the Apothecaries' Society of Dublin? We think not, and in the interest of a large and increasingly influential body of men who have already had to submit too long to the tyrannical rule of the apothecaries, we protest firmly and unmistakably against the proposed Bill, trusting that our brethren across the Channel will at once see the cloven hoof protruding itself, and act accordingly.

That pharmacy in Ireland should be confined exclusively to the members of a profession who, in their own domain, are so jealous of their dignity that we find them continually harping on the time-worn complaint that chemists and druggists do not separate completely prescribing from dispensing, seems to be, to say the least, inconsistent with justice, while it certainly leaves out in the cold those who till now considered that the practice of pharmacy was their profession.

The chemists and druggists of Ireland will be blind to their best interests if they allow such a Bill as the one proposed to be passed into law, and we trust that they will agitate on the subject and be able to show that might is not always right.

Cork, November 22nd, 1870. J. S.

Threats of Law Proceedings against Druggists.

Sir,—A female asked over the counter for sixpennyworth of "steel pills;" about a dozen and a half were given to her (pilulæ ferri carb. P.B.), labelled "steel pills" on the box, and without any comment upon their dose, etc. A gentleman called the next day, saying that the lady had taken some of them, and in consequence was seriously ill, and that proceedings in law would be taken.

What I would ask is, whether the person so purchasing a medicine can bring an action against the vendor? for threats such as these are by no means uncommon in this neighbourhood (generally from people of the Jewish persuasion), and are a source of anxiety, especially as more than one, not far off, have been ruined or nearly so by similar means. I would ask also whether there is a society for the mutual protection of the chemists' trade.

Whitechapel, November 1st, 1870. C. G.

[*⁎* Any one can, if he please, bring an action against any one else, either with reason or without. It is the privilege of those who are unreasonably proceeded against to prove that this is the case, and in some instances to incur much trouble and expense in doing so. We are not aware that any such Society as that referred to is in existence.—Ed. Ph. J.]

Poisonous Feeding-Bottles.

Sir,—I should feel obliged by your inserting these few lines on the above subject, to say that from what has been written and the erroneous impression created in consequence, I made an experiment (on the bottle used by my own baby) with a view of finding out the true cause of the undoubtedly disgusting odour evolved. That the sulphur used in the process of vulcanizing the india-rubber is the cause, I take it there can be no doubt, since after having had the tube and teat of pure black india-rubber in use for some time, they are as sweet and free from smell as when first adapted to the bottle.

South Norwood. J. H. Baldock.

[*⁎* Our own experience enables us to confirm the statements of our correspondent as to the sulphur of vulcanized rubber being the source of the sulphuretted hydrogen. Probably this defect might be remedied by digesting the tube and teats for some time in a moderately strong solution of caustic alkali.—Ed. Ph. J.]

Druggists' Charges.

Sir,—In reference to the letter of your correspondent, "Pharmaceutical Chemist, Cambridge," it seems probable that the mixture was prepared with decoct. taraxaci, in which case 1*s*. 9*d*. or 2*s*. might be a fair charge. That the decoction was intended seems probable from the dose, ℥j. The dose stated in the B.P. for succus taraxaci is ʒj to ʒij. Doctors appear often to write prescriptions without any definite idea of the preparations they are ordering.

As to query No. 33 (Dispensing), what would *H. K.* think of the following?—

℞. Quinæ Disulph. ℈ss
Liq. Ammon. Acet. ℥iss. M.

A teaspoonful every four hours in water.

On taking the above to the prescriber and explaining the sort of mess it would make, he at once said he knew of course it was insoluble, but had thought it would merely require shaking up; however, he rewrote it, adding aqua ad ℥vj, and directing a tablespoonful for a dose. Even this must be prepared "secundum artem," or it will make a mess too.—W. M.

Pepsine and Pancreatine.

Sir,—Having seen in your issue of the 19th inst., Mr. R. J. Kinkead's article, headed "A New Digestive," and relating to the combined use of pepsine and pancreatine in cases of dyspepsia, would you do me the favour of giving publicity to the fact that in a preparation to which I have applied the term "Gastrodyne," I have, for more than twelve months past, used pepsine and pancreatine in combination with the best results? A. Farr.

Waterloo Road, November 19th, 1870.

The Lord Mayor of London.

Sir,—Perhaps it would not be uninteresting to some of your readers to know (from information contained in the *Prescot Observer*) that Mr. Dakin served his apprenticeship with Mr. Threlfall, a Liverpool chemist, who retired from business some time ago, but still lives in the suburbs of that town, and is well known to the writer. Mr. Dakin afterwards removed to a wholesale London house, and on marrying a daughter of his employer, was received into partnership.

Vincit Amor Patriæ.

Liverpool, November 21st, 1870.

"*Spero*" (Yarmouth) is referred to the rule as to anonymous correspondence.

"*A Minor Associate in Business*" (Liverpool).—Apply at Apothecaries' Hall.

R. T. (Edinburgh).—There are no such persons.

Erratum.—The signature of the writer of the letter entitled "Obscure Prescriptions" in last week's Journal was accidentally omitted. It should have been "J. F. Brown, *Dover*."

Communications, Letters, etc., have been received from Mr. A. H. Mason (Liverpool), Dr. Kidd, Mr. J. H. Askew (Liverpool), Mr. G. Wellborn (Grantham), Mr. Jenner (Bury St. Edmund's), Mr. T. F. Best (Camberwell), Mr. E. Barber (Sheffield), Mr. G. W. Jones (Worksop), Mr R. H. Rowell (Houghton-le-Spring), Mr. F. C. Wyatt (Henley), Mr. J. Bordass (Driffield), Mr. J. Staley (Rochdale), Mr. B. H. Cowgill (Manchester), Mr. A. W. Postans (London), Mr. C. Wanron, Mr. W. Wilson (Devonport), Mr. J. H. Baldock (South Norwood), Mr. Ellwood (Leominster), F. B. (Macclesfield), S. S. (Holloway), "Pepsine" (Rugby), "Inquirer" (Bedford), "Reciprocate" (Chichester), "Beta" (York), "Vincit Amor Patriæ," H. G. (Bath), H. H. P., "Two Inquirers," "Alpha" (Sudbury), "Iodi" (Sudbury), "Vulcanite," "Odor," J. S. A.

CINCHONA CULTIVATION IN JAVA.

BY JOHN ELIOT HOWARD.

Many readers of this Journal feel a deep interest in the introduction of the cinchona-trees into the regions of the East. These will naturally inquire what are the results, as practically ascertained, from the many years of labour and the great expense incurred since the month of April, 1852, when the first plant of genuine cinchona arrived safely at Java; and still more expressly since the 13th December, 1854, when M. Hasskarl (sent out by the Dutch Government to collect seeds) arrived with his precious cargo at Batavia.

The first date was that of the introduction of the *Cinchona Calisaya* from seeds collected by Dr. Weddell* (from some one of its *varieties* apparently); the latter was the period from which we reckon the acclimatization of quite another species, which seems to have found a more congenial habitat than the first on the mountains of Java. In fact, the propagation of this latter was so easy and rapid that it became soon an object of attention to botanists, and of somewhat anxious consideration. The plants ere long numbered hundreds of thousands, and the possible eventual value of the species, as a source to be relied upon for the production of quinine, was doubtful. At the end of 1863 these plants were reported 1,139,148 against only 12,093 of *Calisaya*, and a few hundreds of other species.

Being unfamiliar to botanists, it was mistaken for the *C. lucumæfolia*, an illusion which I assisted to dispel; and in the year 1860, being engaged in the publication of my 'Nueva Quinologia,' I received from my friends in Java very ample materials for the description of the species. At the suggestion of those most interested, and as a compliment well deserved by his exertions in the cause of cinchona cultivation, I named it *C. Pahudiana*, after the Governor, M. Pahud, whose term of office was just about expiring. I then pronounced it an inferior species, and expressed my belief that it would prove a source of disappointment to the Dutch Government. From this opinion I have never departed, although I have been willing to follow, with a greater or less degree of expectation, the researches of my friend Dr. De Vrij, whose analysis of the root-bark shows better results than I have been able to obtain from that of the rest of the tree.

It will be understood that I refer to the quinine-producing powers of the species, which seem to me unpromising. In other respects, I have been induced to modify my judgment in a more favourable sense. It is well known that from a therapeutic and pharmaceutical point of view, the value of a specimen of bark does not coincide with the amount of quinine it may contain. Other ingredients, and among them the alkaloid commonly known as *uncrystallizable quinine* (of which this bark possesses a large share), no doubt contribute largely to the medicinal qualities of the bark, and I believe that Dr. De Vrij considers his experiments show that this is superseded by real quinine in the roots. I have found that the bark transmitted by Mr. M'Ivor as that of *C. Pahudiana*, and skilfully prepared by him, attracted the attention of a London broker familiar with the article in preference to those of other, and, in my opinion, superior kinds sent at the same time. I have, consequently, taken up a kind of neutral position in the contest which has been waged with fierceness over this plant even in the Chambers of the Dutch Government. In so doing I have, as is usual, incurred an amount of obloquy disproportionate to the offence, and which is avowedly increased by my having been favoured with so much assistance from my friends in Java, in the way of specimens and of botanical descriptions, as I have fully acknowledged in my 'Quinologia.' Professor Miquel, in particular, has attacked me personally on the subject, though I have never either seen or had correspondence with him. In my 'Quinology of the East Indian Plantations' I expressed myself thus:—"It is extremely unpleasant to come in contact with such a state of things, and I find that I am censured for not being sufficiently one-sided in the dispute. The writer in 'Gids' says, 'Mr. Howard, who described the unfortunate sort as a new species in his noble work on cinchona, although he at first, with reason, brought its usefulness into question, afterwards took a position of weakness and uncertainty as the conflict began to wax warm,'" etc.

To this I have only to reply that I have published such information as came to my hands as correctly as I could, and intend still to do so. I see no occasion to alter my account of the species given in the 'Nueva Quinologia,' and still believe that it is without value *if looked at simply as a source for the extraction of quinine;* but as regards the *root-bark*, I have personally no information to oppose to the favourable estimate elsewhere entertained, and must therefore maintain a position of "uncertainty" till this is removed by those who can decide the question. If the *C. Pahudiana* be looked upon in another point of view, viz. as a *possible source of bark for pharmaceutical purposes*, I have shown in my reports given to the Government of British India, on specimens from Ootacamund, that the quill bark is not only *not* worthless, but that such quills as those sent by M'Ivor were actually preferred to other kinds sent with them by dealers most competent to judge in London, and this is not without reason, from their taste, appearance and chemical composition. I cannot, therefore, agree with those who *recommended** the superfluous labour of cutting down the trees; neither can I rank this plant "among the best sorts of all," as, it seems, some have attempted to do. The trees having now many years' growth, *might perhaps furnish quill bark fit for the home market;* and I shall be surprised if it is not at least equally valued there with the bark of the so-called *C. Calisaya*, which, I am afraid, will prove "unfortunate" also, at least if it produces but 1·3 per cent. as described by Van Gorkom.

It will be seen that the above estimate of mine has been fully borne out by experience, but in the meantime I must revert to the learned professor, who, as I am informed by my friends (for he has not sent me a copy of his work†), says,—

"*Veritati contrarium est*, quod nuper adhuc excla-

* Soubeiran et Delondre, de l'Introduction et de l'Acclimatation des Cinchonas dans les Indes Néerlandaises. 1868. Page 27.

* I have added the *italics* in this and other places to direct the reader's attention. Compare this with the version, "A *magistratu* nostro Indico *jussum* fuisse," etc.

† "De Cinchonæ speciebus quibusdam adjectis iis quæ in Java coluntur, scripsit F. A. Guil. Miquel, in *Annal. Musei Botanici Lugduno-Batavi*," tom. iv. fasc. ix. p. 263; 1869.

mavit Howard, a magistratu nostro Indico jussum fuisse arbores ipsas innumerabiles diruere et exstirpare" (p. 270).

An extract from the *Official* Report of the Transactions in the Dutch Parliament of 27 May, 1862 (sent me in the original and in a translation), is as follows:—

Mr. Uhlenbeck, Minister of the Colonies, speaks,—

"And to show the great difference, I communicate that in all the time that the cinchona culture has been performed on a large scale, there have only been planted 7804 cinchona-trees which really contain quinine, whilst in the meantime there have been planted 1,029,291 trees (Pahudianas), which are only fit for FIREWOOD (*brand hout*)."

Ditto of the session of the Parliament on 2nd June, 1863. Mr. Van Eck (M.P.) speaks:—

"The former Minister of the Colonies stated only the trees are *firewood*, we must DESTROY them" (*uitroeijen*, to *root out, extirpate, destroy, exterminate*).

Professor Miquel also says in the same work:—

"Tædiosam historiam haud repetam, nec habeo quæ ultro opponam Howardio qui me dissentientem indigne tractavit in plagula quadam diurnorum nostrorum mendacem me exclamans."

As I never wrote (nor could write) an article in a Dutch newspaper, M. Miquel can only refer to the following extract from a letter of Dr. de Vriese, who died in 1862, and consequently cannot defend himself.

A letter from myself to Dr. de Vrij, published with my permission, contains the following in reference to the determination of the *C. Pahudiana* (Prof. Miquel, contrary to De Vriese, Dr. Weddell, Markham, etc., identifying the plant with *C. Carabayensis*):—

"I sent over to Dr. de Vriese a fine specimen of the plant in question with the fruit well developed, given me by Dr. Weddell himself. And in a letter written subsequently, under date 4th November, 1860, Dr. de Vriese says,—The examination and comparison of *C. Carabayensis* and *C. Pahudiana* has shown me indubitably that the two species are different. To maintain a contrary opinion would be a lie."

I proceed to say, "I hesitate to copy the above strong expressions, but they throw light on the subject, as showing there must have existed some excitement of the feelings, connected, no doubt, with the great material interests at stake, which may have interfered with calm scientific inquiry, and led, in Dr. de Vriese's opinion, to erroneous statements."

So far my letter, and I must add that it is a very unimportant matter, in comparison, whether these species are identical or (as in my judgment) separate. I had shown in my 'Quinologia' their points of resemblance as well as of separation; but it *is* important that a personal attack, against which I have no opportunity to defend myself, should appear in a work published at the expense and under the auspices of the Dutch Government.

Since the departure of M. Pahud, and the death of Dr. Junghuhn, the cultivation of the plantations has passed under different management, as I have mentioned in the Appendix to my work previously mentioned.

The proportion of plants of different species is now very different. In the second quarter of 1870, according to a paper sent me by Dr. Hasskarl, the plants were as follows:—

C. Calisaya and *C. Hasskarliana*	1,100,983
C. succirubra and *C. caloptera** .	152,782
C. officinalis	222,904
C. lancifolia	43,227
C. micrantha	620
Total . .	1,520,516

The progress of the cultivation is spoken of in warm and eulogistic terms, and the number of *C. Pahudiana* trees (now grown to a good height) is left out of the account.

It is unfortunate, however, that all has to be tested by practical results, and the favourable analyses at present published, have their true value brought to light by the price per pound paid for the barks set forth for public sale in Amsterdam.

In the past season there was a pretty large importation of these barks; and samples under the name of *Konings Kina* and *Bruine Kina* were forwarded to this country, where they were examined, but did not meet with much acceptance. A sale has since taken place in Holland, and the results are not a little curious, and certainly worthy of record. The so-called *Calisaya*, or *Konings Kina*, was bought (as I am informed) by a druggist, at about 2*s*. English, with the intention of its being sold for pharmaceutical purposes, and *not for the manufacture of quinine*. The remainder appears to be *Pahudiana* (but it may perhaps be called *Hasskarliana*), and brought *a higher price*, averaging about 2*s*. 1½*d*. English money. I do not think, however, that any manufacturer of quinine would invest his money in this. As far as my information goes, there has been as yet NO PRODUCTION OF BARK FITTED FOR THE MANUFACTURE OF QUININE, with the exception, perhaps, of one sample which resembled both in appearance and in quality one of the *Calisaya légers* of the French (the product, I believe, of the *C. micrantha Calisayoides*, of Dr. Weddell's new classification). It was consequently a poor and very second-rate bark, although the best from Java. The *C. Hasskarliana* of Miquel is, according to Dr. de Vrij, the result of the interference of the pollen of *C. Pahudiana* with the *C. Calisaya*. Professor Miquel makes it a new species. On this I give no opinion, but I am pleased to see that the *C. Pahudiana*, with its congeners, is proving itself worthy of the character I gave it, as likely to be found useful as a medicine. Of this I have an additional confirmation in the examination of a good-looking sample of bark called *C. Pahudiana*, just brought into the English market from the plantation of a gentleman in Ceylon. This contains a fair portion both of quinine and cinchonidine, and is likely to prove a good bark for pharmaceutical purposes.

M. Van Gorkom concludes his official report for 1864 with the following words:—"Until now the different reports concerning the cultivation of Chinchona have thrown more darkness than light on the subject, and consequently the credit of this great undertaking has suffered."

It would be greatly to the satisfaction of the manufacturers of quinine, if this gentleman would throw light upon the question, what prospect six years of additional experience enable him now to hold out as to any possible supply of their wants from this quarter in the future?

* Probably *C. pubescens*, subspecies *C. Pelletierina*, if the deep green colour attributed to the leaves is correctly represented.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Antimonii Oxidum.—Solution of chloride of antimony is poured into water, and the white precipitate of oxichloride of antimony allowed to settle and partially washed by decantation. It is then digested with solution of carbonate of sodium till completely decomposed, and finally the deposited oxide is washed to free it from chloride of sodium. The reaction consists in the formation of an insoluble compound of oxide and chloride of antimony:—

$$x\,SbCl_3 + 3H_2O = Sb_2O_3.(x-2)\,SbCl_3 + 6HCl.$$

The proportion of oxide in the precipitate increases with the proportion of water used for washing. The carbonate of sodium removes the last traces of chloride—

$$2SbCl_3 + 3Na_2CO_3 = Sb_2O_3 + 6NaCl + 3CO_2.$$

Prepared in this way the oxide generally has a buff tint, from the presence of a minute quantity of oxide of iron. It can be procured perfectly white by redissolving the washed oxichloride in hydrochloric acid and reprecipitating with water: the second washings should be performed with water to which a few drops of acid have been added. If heated too strongly or exposed to the air too much during drying, it is apt to become partially converted into the double oxide Sb_2O_4, formerly called antimonious acid. When in this condition it will not dissolve completely in acid tartrate of potash, as stated in the Pharmacopœia. Antimonic anhydride is left—

$$2Sb_2O_4 + 2KHC_4H_4O_6$$
$$= 2SbO\ K\ C_4H_4O_6 + Sb_2O_5 + H_2O.$$

Antimonium Sulphuratum.—Black sulphide of antimony is powdered and boiled for two hours with solution of soda. The strained solution is then mixed with a slight excess of dilute sulphuric acid and the precipitate collected, washed and dried on a water bath. The sodic hydrate may be represented as acting two parts. One half undergoes decomposition with the sulphide of antimony, yielding sulphide of sodium and oxide of antimony; the other half dissolves up the oxide of antimony, as it is formed:—

$$Sb_2S_3 + 6NaHO = Sb_2O_3 + 3Na_2S + 3H_2O.$$

The sulphide of sodium that is produced takes up at the same time sulphide of antimony. Thus two soluble compounds result, the second being the counterpart of the first, but containing sulphur in place of oxygen, atom for atom:—

$$3Na_2O, Sb_2O_3 = 2Na_3SbO_3.$$
$$3Na_2S, Sb_2S_3 = Na_3SbS_3.$$

On the addition of sulphuric acid to the solution of these two, sulphide of antimony is alone deposited, for the sulphuretted hydrogen produced by the decomposition of the second compound suffices to convert the oxide of the first into sulphide:—

$$Na_3SbO_3 + Na_3SbS_3 + 3H_2SO_4$$
$$= Sb_2S_3 + 3H_2O + 3Na_2SO_4.$$

This must, however, be accepted as an explanation only of the principal features of the decomposition; other minor and more complex reactions go on simultaneously. They arise chiefly from the action of the oxygen of the air during the boiling.

If the alkaline solution be allowed to cool before the acid is added, a brown precipitate, a compound of oxide and sulphide of antimony, is deposited. This is what was formerly known and employed as mineral kermes.

[§ Sixty grains of this preparation dissolved in hydrochloric acid and dropped into water give a white precipitate, which, when washed and dried, weighs about 53 grains.] This cannot be regarded as by any means a satisfactory test. If, for example, rather too much hydrochloric acid were employed for dissolving it, a considerable proportion of the compound would be lost in the form of chloride, which would be retained in the mother liquor. A better plan would be somewhat as follows:—50 grains moistened with nitric acid, then dried and heated to redness, would give a white residue weighing about 45 grains. And the weight of this is not sensibly altered by washing with boiling water.

Antimonum Tartaratum.—Oxide of antimony is mixed with cream of tartar and water into a paste, allowed to stand twenty-four hours, and then water added and the whole boiled up, filtered and set by to crystallize. A little antimonic anhydride, Sb_2O_5, is generally left insoluble in the form of a white powder.

The formula of this compound, as given in the Pharmacopœia, seems to be anomalous. It is better to represent it as a tartrate containing an atom of potassium and an atom of a compound radicle, to which it is not necessary to give a name, but which replaces the atom of basylous hydrogen belonging to the cream of tartar from which the salt is made. Antimony is usually trivalent, Sb''', the union of one atom with an atom of oxygen which is bivalent O'', gives, therefore, a compound which is univalent $(Sb'''O'')'$. The formula of tartar emetic, written on this principle, is then $(SbO)'KC_4H_4O_6$. Crystals of the salt are easily recognized by their triangular facets, which are marked by parallel lines. A solution of the salt in a mixture of hydrochloric and tartaric acids gives with sulphuretted hydrogen an orange precipitate of sulphide of antimony. This compound, after being dried in a water bath, contains only a very small quantity of water (about $1\frac{1}{2}$ per cent.); if heated more strongly it suddenly loses its amorphous state, becoming black and crystalline. It is then identical in composition with the native sulphide.

Argenti Nitras.—Pure silver is dissolved in diluted nitric acid, and the solution evaporated till it yields crystals:—

$$3Ag_2 + 8HNO_3 = 6AgNO_3 + N_2O_2$$
$$+ 4H_2O.$$

Traces of gold, or of sulphide of silver, which may be present, will remain insoluble as a nearly black powder. Solutions of nitrate of silver are best decanted from any sediment, not filtered, since contact with the organic matter of the filter renders the nitrate of silver liable to decomposition on exposure to light. Nitrate of silver is often made by dissolving silver coins, or other form of common silver. Brazilian and Portuguese coins are used for this purpose. When this plan is adopted, the solution is evaporated to dryness and the residue heated strongly for some time. The nitrate of copper present is in this way decomposed, giving insoluble black oxide of copper:—

$$2(Cu2NO_3) = 2CuO + 2N_2O_2 + 3O_2,$$

whilst the nitrate of silver remains unchanged. On treating with distilled water the latter alone dissolves.

[§ 10 grains dissolved in distilled water give with hydrochloric acid a precipitate, which, when washed and dried, weighs 8·44 grains. The filtrate when evaporated by a water bath leaves no residue.] Adulteration of the fused stick with nitrate of potash would in this way be detected.

(To be continued.)

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.*

(Continued from page 385.)

Ammonium Carbamate.

History.—Who discovered that ammonia and carbonic anhydride unite to form a solid I do not know. Gay-Lussac first determined the proportion in which these gases combine.

Preparation.—(*a.*) By the direct union of dry ammonia and carbonic anhydride gases, when it is deposited partly as an incrustation on the walls of the vessel in which it is formed, and partly as flocculi. This is the earliest method known.

(*b.*) (Rose's method.)—By distilling together ammonium sulphamate and anhydrous sodium carbonate, when it is also obtained as an incrustation on the walls of the condensing vessel.†

(*c.*) (Kolbe and Basaroff's method.)—By passing carbonic anhydride and ammonia gases, both perfectly dry, into cold absolute alcohol, separating the copious crystalline precipitate by filtration from the greater part of the liquid, and heating it with absolute alcohol in a hermetically-sealed tube to 100° or above, when the liquid on cooling deposits the carbamate in large crystalline laminæ.‡ I have not repeated any of these processes. I am able to add to them several others made out by myself.

(*d*). By passing carbonic anhydride and ammonia gases into concentrated aqueous solution of ammonia, when the carbamate separates in crystals, which, when dried as well as possible by pressure between folds of bibulous paper, contain only a little carbonate.

(*e.*) By digesting in a closed vessel an aqueous solution of ammonia, saturated with the gas at a low temperature, with either the commercial carbonate, or any other carbonate of ammonium, at a temperature of 20°–25° for thirty-six or forty hours, when the carbamate either crystallizes out at once on cooling, or will do so after cooling the solution, passing more ammonia gas into it, adding more carbonate, repeating the digestion as before, and then again cooling. This process has been already described in the account of the reactions of the normal and acid carbonates. The best carbonate to employ is the commercial carbonate, because it yields more of the carbamate, as might be anticipated from its composition.

(*f.*) By heating the commercial carbonate of ammonia mixed with a sufficient quantity of anhydrous potassium carbonate in a retort, immersed in a water-bath at a temperature carried slowly from about 50° to about 80°, and connecting the neck of the retort with a wide tube dipping under mercury, when the neck of the retort becomes incrusted with the carbamate in a translucent crystalline condition. The water-bath is to be maintained at a temperature not much exceeding 60° C. until ammonia gas, which is at first generated in large quantities, has nearly ceased to escape through the mercury. The temperature of the bath is then to be raised, but not so rapidly as to cause any material escape of gas through the mercury.

(*g.*) By distilling, as in the last process, a mixture of the commercial carbonate of ammonia and anhydrous calcium chloride, when an incrustation forms, similar in every respect to that obtained in the last case, which is the carbamate. At a temperature of the water-bath of about 48° a considerable quantity of carbonic anhydride escapes through the mercury, and at about 52° the incrustation begins to form, and continues to do so with very little further escape of gas, while the temperature is allowed to rise very slowly to 65°, a temperature which is sufficient to carry the process to its completion.

(*h.*) By distilling the commercial carbonate extremely slowly, when the more remote part of the earlier formed incrustation will be found to be impure carbamate. I have obtained samples from an incrustation thus prepared, in which six-sevenths and five-sixths respectively of the contained ammonia were in the state of carbamate. There are no sensible qualities by which the composition of the product can be inferred, so that it is quite possible, indeed, more probable than not, that parts of the incrustation were more nearly pure carbamate than the samples selected for analysis proved to be. This process is, of course, only of interest from a theoretical point of view. The product obtained by Rose by a similar process is not the same as that obtained by me, a fact which admits of a ready explanation, as will be presently seen.

(*i.*) By distilling the normal carbonate at a heat not exceeding 60°, when a solid condenses containing even less water than the product of method (*h*).

(*j.*) By repeatedly dissolving commercial carbonate at a gentle heat in the same quantity of water, cooling after each addition, and separating the crystals, as already described, until crystals of normal ammonium carbonate are deposited; then once more warming the solution, dissolving a fresh quantity of commercial salt in it, allowing it to cool and crystallize for a day, separating the crystals, passing ammonia gas, straining off or not (as may be necessary) the precipitate of normal carbonate produced, renewing or continuing the stream of ammonia till the solution (kept cool) is about saturated, and straining off the precipitate of normal carbonate, when the solution will prove by its reactions to be apparently a solution of carbamate with a little carbonate dissolved in it. I think it not unlikely that by carrying this process further, with some modification, crystals of carbamate might be obtained; but I have made no experiments in this direction.

(*k.*) By distilling the commercial carbonate with strong spirit, or, probably better still, with absolute alcohol. The carbamate is wet—mixed with water and spirit—but contains very little carbonate.

Sensible Qualities.—Ammonium carbamate has a strong smell of ammonia, but not at all equal to that of the normal, or even half-acid, carbonate. As regards its taste also, it is strongly ammoniacal, but without the causticity of the normal carbonate.

Form.—It occurs in the form of flocculi; of an incrustation more or less crystalline; of prisms found sometimes projecting from this incrustation; of crystalline laminæ (Kolbe and Basaroff); and of crystals neither tabular nor decidedly elongated or columnar.

Of the system of the last-named crystals, I am unable to speak with any degree of assurance, but they seem to belong to either the right or the oblique rhombic prismatic system. They frequently occur massed together, like crystals of alum, one crystal capping the other, as it were. When solitary they are not only of no great size, but also are rapidly deprived of their angles and edges by the changes they undergo. When their growth is not interfered with by contact with each other and with

* Abstracted by the author from his paper in the *Journal of the Chemical Society.*

† Poggendorff's 'Annalen,' vol. xlvi. p. 373. Also Taylor's 'Scientific Memoirs,' vol. ii. p. 98.

‡ Direct conversion of ammonia carbamate into urea. *Journal of the Chemical Society* (2), vol. vi. p. 194.

crystalline particles of the normal carbonate, they are perfectly transparent. The incrustation consists of prisms arranged perpendicularly to the surface of formation. The translucency of the mass attains a high degree of perfection in those parts formed nearest to the source of heat. Fragments from this part of the incrustation appear almost perfectly transparent when thrown into water. In appearance this form of the carbamate differs little, if at all, from a similarly formed deposit of acid-carbonate—with one exception. This is in the parts formed near the source of heat, which acquire an increased translucency by the continued action of the heat employed in carrying on the process, and also undergo marked contraction, so as to exhibit gaping fissures, and become partly separated from the walls of the retort on which they rest. This phenomenon is always observed in the carbamate, whether formed by the action of potassium carbonate or calcium chloride, and never with hydrated incrustations, according to my experience. The prisms which sometimes project from the free surface of the incrustation are thick and generally very short, but sometimes they pass right across to the opposite wall of the retort-neck or condensing-tube.

Chemical Composition.—It is unnecessary for me to adduce evidence to prove that ammonium carbamate is composed, according to the formula—

$$CO_2(NH_3)_2,$$

of

Carbonic anhydride . .	56·41
Ammonia	43·59
	100·00

Behaviour on Exposure.—It evolves an odour of ammonia which, when a solid lump of it, or a crystal, is exposed freely to the air, rapidly diminishes in intensity; at the same time the carbamate gradually deliquesces; by continuing the exposure it is nearly dissipated. The residue left is acid carbonate, generally in the form of a porous cast or superficial skeleton of the original fragment.

The deliquescence of the carbamate is an interesting fact, not only as affording further evidence that the carbamate has only a slowly-manifested chemical affinity for water, but also as distinguishing between the mere physical attraction of a body for water, and its chemical transformation with water into a new substance.

Behaviour when Heated.—Ammonium carbamate, unlike the true carbonates, does not fuse when heated. According to John Davy it is converted into gas at 60° C. My own experiments very nearly confirm this statement. I was not able to fix the point very closely, but found it to be about 59°.

It has been for many years familiar to chemists that the carbamate obtained from two volumes of ammonia and one volume of carbonic anhydride yields three volumes of vapour. A fact like this is now held by most chemists to be proof that a substance thus behaving is decomposed at the moment when it assumes the gaseous state. Bineau took the density of the vapour of the carbamate at ordinary temperatures,* and found it also to accord with the sum of the volumes of the ammonia and carbonic anhydride which form it. Another proof that it is decomposed when dissipated at ordinary temperatures, is to be found in the powerful odour of ammonia which is then perceived; for it is inconsistent with what we know for certain of the change in properties produced by chemical combination, to suppose that a compound of ammonia should smell like ammonia itself.

Bineau has also furnished us with special evidence that the vapour, obtained by distilling carbamate, is nothing but a mixture of the two above-named gases. He observed* that the gaseous product obtained by exposing the salt to heat retains its gaseous state at a temperature which is lower than that at which it is formed. I am myself able to confirm this statement.

Behaviour with Water.—One part of ammonium carbamate dissolves in about one and a half parts of water, sensible cold being produced by the solution. It dissolves unchanged, as is shown by the reactions of the solution immediately after it is prepared. But the carbamate in solution soon combines with water and becomes carbonate, according to this equation,—

$$CO_2(NH_3)_2 + 2OH_2 = CO_4(NH_4)_2H_2.$$

Behaviour with Alcohol.—Ammonium carbamate is soluble in spirit of sp. gr. ·829, according to John Davy. In absolute alcohol, when heated with it in a sealed tube, it dissolves, and crystallizes out when the solution is allowed to cool (Kolbe and Basaroff). I have made no experiments on this subject myself.

Behaviour with Ammonia-water.—It dissolves freely in the strong ammonia-water of commerce, with production of cold. At 15° one part dissolves in a little more than two parts of the ammonia-water. The solution, left to itself for some time, yields crystals of the normal carbonate. But when cooled down to about 0° soon after it is made, it yields the carbamate again in relatively large crystals. Ammonia, therefore, has the power, well marked, of impeding the hydration of the carbamate. To this fact is probably due the success in obtaining the carbamate from the carbonate by heating its solution in presence of ammonia.

Reactions which serve to distinguish the Carbamate from the Carbonates generally.—Rose has pointed out the following:—The carbamate is not perceptibly affected by dry hydrochloric acid in the cold, and warmed in the acid is decomposed without liberation of water. In dry chlorine gas it is not at first affected, but is slowly decomposed without formation of water. It assumes in the cold a pale yellowish colour when placed in sulphurous anhydride. Heated in sulphuretted hydrogen gas, no water is produced. It yields carbonic anhydride *without effervescence* when the vapours of sulphuric anhydride are passed over it.

Besides these, it has a special reaction in solution with calcium chloride; when mixed with anhydrous calcium chloride it can be expelled by a gentle heat, leaving the chloride unchanged; it does not melt or become moist when heated, and it dissolves freely in strong ammonia-water. Its becoming moist on exposure is not characteristic, as both the half-acid and the normal carbonates become moist also, though from a different cause.

Chemical Constitution of the Carbamate.—Analogy has caused this salt to be regarded by Gerhardt, and most chemists after him, to be like the salts formed by the union of other anhydrides with ammonia; conclusive evidence on this point is still wanting. There are no metallic carbamates known. With calcium chloride and with barium chloride it does not, however, behave like ammonium carbonate; and this is probably due to the formation of a not very insoluble calcium carbamate. In connection with this point I may state that by adding to the solution obtained from the commercial carbonate by water—method (*i*)—a concentrated solution of calcium chloride, I have obtained a crystalline precipitate not only somewhat soluble in its mother-liquor, but which, after being filtered off and pressed between bibulous paper, has sometimes proved almost perfectly soluble in water, though in a few minutes its solution deposited calcium carbonate; it did not smell of ammonia. I am not sure that this precipitate, however, was really calcium carbamate; but I made analyses of it in its impure and damp state, not venturing to wash it, and

* "Recherches sur les Densities de Vapeur." *Ann. de Chimie*, vol. lxviii. p. 416.

* "Sur quelques Combinaisons ammoniacales et sur le rôle que joue l'Ammoniaque dans les réactions chimiques." *Ann. de Chimie*, vol. lxvii. p. 240.

the results of these agree remarkably well with a compound having either of the following formulæ,

$CO_3(NH_4)_2, CO_3Ca.$ — Ammonio-calcium carbonate. $(CO_2NH_2)_2Ca.$ — Calcium carbamate.

mixed with hydrated calcium chloride. A similar precipitate is obtained with barium chloride. The probability, I think, is, that the precipitates are carbamates; and if so the constitution of the ammonium carbamate is that expressed by its name, and by the formula—

$$CO_2(NH_2)(NH_4).$$

(*To be continued.*)

A NEW MATERIAL FOR SUPPOSITORIES.

Mr. T. Carre, of Meaford, has communicated to the *Canadian Pharmaceutical Journal* a formula for a new material for the administration of opium or other medicine, by suppository. He says that in trials made upon patients suffering from hemorrhoids he has found it, from its elastic texture, to possess advantages over other excipients used for a like purpose. Gelatin being one of the ingredients, it could not be used for making suppositories containing tannin, as an insoluble and inert substance would be formed. The following is the formula:—

Best Glue	4 oz.
Glycerine	8 oz.
Golden Syrup	2 oz.
Water	8 oz.

Soak the glue in the water until quite soft, then dissolve over steam or water bath. Mix the syrup and glycerine well together, add them to the glue solution and boil until they lose about 2 oz. in weight; then pour out on an oiled tray, or into any suitable mould, previously removing any scum formed. The result is an elastic substance, which will keep for a long time, but dissolving more readily when fresh. When required for use the composition should be dissolved in a little water with gentle heat, the opium or other drug mixed with it, and then run into a mould.

CHALK MIXTURE.

The following formula is published in the *American Journal of Pharmacy*, by Mr. W. H. Robinson, of Pottsville, who says he has used it for two years and found it satisfactory:—

℞ Cretæ Præp.	1 troy ounce.
Sacchari,	
Pulv. G. Acaciæ,	each ½ troy oz.
Ol. Cinnamomi	15 drops.

Mix in the usual manner with a pint of water.

SYRUP OF CITRIC ACID.

Mr. Benjamin Lillard, of Nashville, Tennessee, sends the following original formula for the preparation of syrup of citric acid to the *American Journal of Pharmacy*:—

Take of Citric Acid, in fine powder	60 grains.
Water	a sufficient quantity.
Syrup	16 fluid ounces.
Oil of Lemon	30 minims.

Dissolve the citric acid in the water, add the syrup and spirit of lemon, shaking well until they are thoroughly mixed.

When convenient, hot or warm water may be used. He says, "I have used the syrup made by this formula for over eighteen months, including two summers in this climate, and have found it to retain its brilliancy and flavour better than when prepared by the old formula."

A Confidential Circular from New York.—A firm in New York have forwarded printed circulars to many persons in England offering to supply them with aluminium sovereigns. They say that the base coins are "minted with the express design of circulating in Great Britain, being of such perfect execution, and so admirably calculated, both as regards weight, colour, sound, and resistance to acid tests, to deceive the most accomplished experts, that their detection is almost beyond the bounds of possibility." "The aluminium of which they are composed" is stated to have been "discovered in a valley among the Rocky Mountains, and was at first mistaken, not only by the miners but by dealers in the precious metal, for pure gold. It was more than a month before its true character was discovered, for it was so much like pure gold that the difference could be detected only by its lighter weight." The price of these imitation sovereigns is annexed in the "strictly confidential circular"—namely, £2 for 20, 53 for £5, £10 for 108, £20 for 218, and £50 for 550. "No more than 550 sovereigns will be sent at one time to any one person, for fear they might lose their prudence and pass them off too rapidly, thereby causing suspicion, for they are so easily passed that some persons might get too greedy and overdo the business." The circular also contains directions how to send an "order for sovereigns" to a firm of tobacconists in the Broadway, New York, who in the list of prices, also printed, which accompanies the "strictly confidential circular," boast of having "paid over 3,100,000 dollars taxes to Government in four years." It is recommended to "word your letter in sending an order for sovereigns so as to make it read as if you were ordering so many pounds of smoking tobacco." The price list and "strictly confidential circular" are enclosed in envelopes of a yellow colour, with two three-cents postage stamps on each. —*Times.*

Tannin versus Alum.—Dr. Max Jaffé, of Hamburg, says that alum, so frequently used for gargles, is hurtful to the teeth; he thinks that tannin, dissolved in water or red wine, is far preferable.—*Lancet.*

DRUG MARKET NOTES.

Under this head we purpose giving occasionally *some* particulars as to the drugs, etc., imported into this country, and shall be glad to receive information on the subject from correspondents.

Among parcels of drugs which have lately been offered for sale were the following:—

Nux Vomica, 424 bags and 240 pockets.
Gambier, 181 bales.
Bees' Wax,—Madagascar, 9 cases; Cape, 2 cases; Angola, 46 cakes; Gambia, 58 cakes.
Japan Wax, 66 cases.
Sandal-wood, 4 tons.
Sandal-wood Oil, 2 cases.
Roll Annatto, 241 baskets.
Opium,—Turkey, 77 cases; Persian, 25; Indian, 5; Egyptian, 3.
Scammony, 23 cases.
Camphor,—China, 240 cases; Japan, 20 tubs.
Cocculus Indicus, 213 bags.
China Soy, 65 casks.
Honey,—Australian, 5 barrels; Jamaica, 2 barrels.
Castor Oil, 610 cases.
Crown Bark, 53 bales.
Cubebs, 210 bags.
Ipecacuanha, 11 serons.
Cascarilla Bark, 57 serons.
Olibanum, 61 cases.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 3, 1870.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

CHEMISTS AND DRUGGISTS' FUND FOR THE SICK AND WOUNDED.

In accordance with the notice given some weeks since, we now close the Subscriptions to this Fund. The contributions received since the last publication, October 15, 1870, are as follow:—

	£.	s.	d.	£.	s.	d.
John S. Hodgkinson, Matlock Bridge				0	5	0
Per W. F. Blake, Loc. Sec. at Stroud:—						
W. F. Blake, Stroud	0	10	6			
Mrs. Gay ,,	1	1	0			
James B. Carr ,,	0	10	6			
J. Alfred Pearce, Cainscross	0	10	6			
John Simpkins, Minchinhampton	0	10	6			
				3	3	0
W. M. B., London				0	5	0
Rev. D. Anderton				0	5	0

J. F. Thursfield, Kettering,
15 bottles Condy's fluid,
And a bundle of old linen.

Altogether the money contributions amount to the sum of £139. 17*s.* 2*d.* This has been handed over to the National Association without any deduction. In addition to this sum a large quantity of medicine and materials of various kinds has been sent up to the Society's house, by various members of the trade, and this also has been handed over to the Association. Had the subscriptions to the Fund been more general a very large sum would have been collected; but it must be borne in mind that many who have not contributed to it were compelled to give their aid in conjunction with their immediate neighbours to the local funds raised with the same object, and that this was the only reason why many names are absent from the list of subscribers to the Chemists and Druggists' Fund.

We are informed by correspondents that at two other places besides those mentioned by us last week, members of the drug trade have been chosen as mayors, viz. Beverley, Yorkshire, where James M. Robinson, Pharmaceutical Chemist, has been elected for the sixth time, and Abingdon, Berks, where William Ballard, Pharmaceutical Chemist, fills the office of mayor.

We beg to remind our readers that the meeting to be held on the 7th inst., promises to be of sufficient interest to induce a large attendance. Mr. Howden's communication on the state of Pharmacy in America will offer many opportunities for profitable discussion of our own condition, and for the comparison of various modes of dealing with details. The production of opium in our Australian colonies is also a subject that is of special importance. Mr. Allchin, we understand, will also bring before the meeting a description of an easy and effectual mode of bottling infusions, fruits, etc., for preservation. Mr. C. H. Wood is also to bring forward some pharmaceutical notes.

The *British Medical Journal* announces that the Poor Law Commissioners for Ireland have ordered an apothecary to be appointed who shall purchase drugs, compound them, and distribute them to the various unions. It is thought that, besides securing pure medicines, the expenditure, now amounting to £32,000 annually, may be considerably diminished. The salary is to be £500, and the election is vested in the hundred and sixty-three Poor Law Boards which exist in Ireland.

In the closing number of the forty-second volume of the *American Journal of Pharmacy*, which we have just received, there is an announcement that it is in contemplation to begin the next volume with a monthly issue instead of a bi-monthly one. Mr. William Procter, jun., who has for twenty-five years acted as editor of the journal, expresses his sympathy with the change, but at the same time intimates his intention of taking the opportunity to resign.

The Council of the Apothecaries' Hall of Ireland have selected "The British Pharmacopœia" as the subject for the annual prize to be competed for by apprentices to apothecaries in May next.

The Anniversary Session of the St. Andrew's Medical Graduates' Association will be held at the Freemasons' Tavern, on Saturday, December 3, at 5 p.m., when an address, entitled "For the Future of Physic," will be delivered by Dr. Richardson, F.R.S., President of the Association.

NOTICE.—The reports of proceedings at the meetings of provincial societies frequently do not reach us until some time after the meetings. The secretaries of the societies are requested to furnish these reports as early as possible for insertion in the Journal. They should reach the Editor's office not later than Wednesday morning, if intended for publication in the current week, or if a proof be required, not later than Monday.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The first meeting of this Society for the Session 1870–71 was held at the Philosophical Institution, on Friday, Nov. 11. The Hon. Secretary (Mr. Schacht), having read the minutes of the last meeting, announced the arrangements the Council had made for the ensuing session. These were—

"Organic Chemistry," a course of thirty lectures by Mr. Coomber, F.C.S.

"Inorganic Chemistry," a course of thirty lectures by Mr. Coomber, F.C.S.

"Vegetable Physiology and Economic Botany," a course of thirty lectures by Mr. Leipner.

"Systematic Botany," a course of thirty lectures by Mr. Leipner.

In addition to these regular courses of scientific instruction, there would be monthly meetings in that theatre, open to members and associates, at which subjects of professional interest would be presented. The following was the list as at present arranged:—

Friday, Nov. 11, a lecture by Mr. W. W. Stoddart, F.G.S., on "The Chemistry of the Sugars."

Friday, Dec. 16, a lecture by Mr. Thomas Coomber, F.C.S.

Friday, Jan. 13, a lecture by Mr. Adolph Leipner.

Friday, Feb. 10, Pharmaceutical Papers and Discussions.

Friday, March 10, a lecture by Mr. W. Lant Carpenter, B.Sc.

Friday, April 14, a lecture by Mr. W. A. Tilden, B.Sc.

Friday, May 12, Pharmaceutical Papers and Discussions.

Mr. Stoddart, the President of the Association, instead of the usual inaugural address, then delivered a lecture on "The Chemistry of the Sugars," explaining their natural history, manufacture, and analytical reactions. The latter were more particularly explained when Pharmaceutical preparations were alluded to, as will be seen from the following head-notes:—

The Saccharine Group.—Cane sugar; grape sugar; fruit sugar; office in plant life; office in food; Liebig's theory doubted; distinction between sugar, starch, and gum.

Cane Sugar.—(Sucrose $C_{12}H_{22}O_{11}$), in what found, manufacture, statistics, preparation on the small scale; sucrates (Liq. Calc. Sacch.), crystalline form (sugar candy), properties, decomposition, by heat (barley sugar), (Sacch. Ust.), by chemical agents, by alkalies, by acids (Syr. Limon.), (fruit tarts).

Grape Sugar.—(Dextro-glucose $C_6H_{12}O_6$), where found, manufacture, statistics, American method (bread), glucosides, from cellulose (*Cetraria islandica*), false honey, false manna, properties, fermentation (beer, alcohol), decomposition, by heat (glucose caramel), by chemical agents (Bottger's test, Trommer's test, Mel Æruginis), by acids (cod-liver oil), by alkalies (Mulder's test).

Fruit Sugar.—(Lævo-glucose $C_6H_{12}O_6$). Where found, properties (treacle).

Analysis.—Centigrade testing (Lowe's test), fermentation process, specific gravity (Syr. Simplex), polarizing saccharimeter, impurities.

The whole was illustrated by copious experiments and apparatus. Two polarizing saccharimeters were shown and explained. One of the well-known Soleil model, and the other of more recent construction by Hoffmann, of Paris. Among the specimens of cane-sugar was a splendid crystal, nearly two inches long, with the faces and angles perfectly formed,—in fact a saccharine Koh-i-noor. Among the statistics given was one that sounded somewhat startling, namely, that each Englishman consumed more than a quarter of a hundredweight of sugar per annum. The experiment showing the fermentation process was especially interesting. The sugar was seen fermenting, and the carbonic acid was collected. The carbon was then separated from the gas as a black powder.

Just as we are going to press, we have received reports of meetings of the Glasgow Chemists and Druggists' Association (Nov. 14) and the Liverpool Chemists' Association (Nov. 24).

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting at Liverpool.

Wednesday, September 14th.

(*Continued from page* 436.)

Pharmaceutical Exhibition, held at Liverpool, September, 1870, in connection with the Meeting of the British Pharmaceutical Conference.

Agnew, J., *Liverpool.*
Cod-liver oil jelly.

Attfield, Professor.
Weights and measures. Comments on the metric decimal system. Model illustrating the cubic contents of a litre.
Photographs of prominent Members of the Pharmaceutical Conference.

Austin and Co., *Liverpool.*
Cardboard, wood and ornamental paper boxes for chemists' use. Glass feeding-bottles.

Baildon, H. C., *Edinburgh.*
India-rubber poison capsules. Saccharo-chirettine—active principle preserved by sugar, by D. S. Kemp and Co., Bombay and Poona.

Balmer, J., *London.*
Specimens of the sulpho-carbolates of the metals, alkalies and alkaline earths.
The new belladonna plaster. *See* Pharm. Journ., May, 1870.

Barber, George, *Liverpool.*
Pharmaceutical labels for bottles, drawers, museums or cabinets of materia medica. Each label contains an abridgment of the information found in the Pharmacopœia. In this way the labour of reference is avoided.
The medico-botanical map of the world and pocket companion to the Pharmacopœia.

Beatson and Co., *Rotherham Glass Works.*
Poison bottles.

Blandy, H. Blandy's patent wash-bottle for nitrous oxide gas.

Bostock, W., *Ashton-under-Lyne.*
Genuine medicated lozenges.

British Seaweed Company, Limited, The, A fine collection of products from seaweeds, obtained by Stanford's process, numbering about fifty specimens; the series includes three varieties of *Laminaria* and three varieties of *Fucus*, which are generally used for this purpose. The charcoals from these are all shown, and the residues after lixiviation. The crude potash and soda-salts thus obtained, with crude iodine and bromine, follow in a series. Resublimed iodine, in fine crystals, and a collection of pure potash salts, manufactured by this Company, are also exhibited. The pure chloride forms the basis of these; sulphate, carbonate and bicarbonate, iodide and bromide are specially well-represented salts of which the Company are large makers. This admirable collection has been presented to the Museum of the Pharmaceutical Society, by Edward C. C. Stanford, Esq., who has promised further to add to it, and to exhibit results of his latest researches on seaweed.
A stuffed specimen of the *Fulmarus glacialis*, or *Fulmar Petrel* of St. Kilda, and a specimen of the oil vomited

by it. This remarkable bird is described in a paper read before the Conference by Edward C. C. Stanford, Esq., and the specimen is presented by him to the Pharmaceutical Society.

Products from excreta obtained by Stanford's process. These are sulphate of ammonia and solution of ammonia, exhibited to show the purity of ammonia salts from this source. Acetate of lime and excreta charcoal which has been burnt twenty times. The process is a dry process, in which charcoal is substituted for earth; the quantity required is one-fourth that of earth, and the supply is derived from the excreta itself; the charcoal from this source being a most powerful deodorizer.

Particulars of Stanford's patent process may be seen in the *Chemical News*, vol. xx. p. 196, also *Report of British Association*, 1869, and *Proceedings of Glasgow Philosophical Society*, 1869.

BUSHBY, THOMAS.
Pill-making machine.

CALVERT AND CO., *Manchester*.
Carbolic acid, crude and refined.
Sulpho-carbolates.
Carbolic soaps, in bar and cakes.
Picric acid.
Disinfecting powder.

'CHEMIST AND DRUGGIST,' PROPRIETORS OF THE *London*.

The whole of the designs (twenty-eight in number) for a dispensing counter, for the prize offered by the proprietors of the *Chemist and Druggist*. The competitor who obtained the prize was Filmer Kidston, Duke Street, Union Street, Bishopsgate, London, with the following report:—"This design has several points of excellence; besides being the best arranged and most convenient as a dispensing counter, it is handsome in appearance without being showy."

Five other competitors were awarded honourable mention, viz. Messrs. Beynon, Fletcher, Watson, Willis, and Young. The gentlemen appointed to judge the merits of the designs were Messrs. T. H. Hills, Joseph Ince and Charles Savory. The various designs seemed to afford great interest to pharmaceutists, and were freely criticized during the whole time the Exhibition was open.

A model of the arrangement for the storage of poisons, by Mr. J. C. Young, of Warrington. A full description, with engraving, appears in the *Chemist and Druggist*, September 15th, 1870.

DINNEFORD AND CO., *London*.
Improved horsehair flesh gloves, belts, Clarendon flesh rubbers, Cambridge and excelsior pads, horse glove brushes, etc., manufactured by them with improved machinery.

ELLIS AND CO., *Ruthin*.
Mineral medicated waters.

EVANS, SON AND CO., *Liverpool;* AND EVANS, LESCHER AND EVANS, *London*.

One of the most interesting series of objects exhibited was a large collection of living plants in pots,—mainly contributed, we understand, by the kindness of Mr. Tyerman, Liverpool Botanic Gardens, and representing the source of many articles of materia medica not produced in Great Britain. The list is as follows:—

Jalap; camphor; Barbadoes aloes; green tea; tapioca; lime; arrowroot; scammony; gamboge; annatto; lemon grass; nutmeg; cinnamon false, ditto true; clove; locust; castor oil; coffee; vanilla; cinchona pale, ditto yellow; nux vomica; mango; jatropha curcas, or physic nut; caper; ginger; long pepper; tamarind; black pepper; balsam of Peru; pomegranate; Montserrat lime fruit juice, and mature fruit; and tree with immature fruit imported from the Olveston plantation in the island of Montserrat.

MESSRS. EVANS, SON AND CO. also exhibited a large collection of drugs and pharmaceutical preparations, concentrated waters, etc.
Bengal opium.
Patna ,,
Turkey ,,
And various other raw drugs.
Sapo durus for liniments, with specimens of lin. potass. iodid., etc.
Crystallized oil of thyme, or thymol.
Cabinets of materia medica and chemicals; Lescher's 'Elements of Pharmacy,' and other books; pharmacy microscopes of various powers, prices, etc., suitable for students.

EVANS, R., *Liverpool*.
Improved feeding-bottle.

FOULKES, W. J., *Birkenhead*.
Transparent fluid cement.
Specimens of breakages in glass and pottery admirably joined therewith.

GILBERTSON AND SONS, *London*.
Poison bottles, Merrikin's patent pentagon acid bottles with indestructible labels.

GILLON AND CO., *Leith*.
Extractum carnis and essence of beef, concentrated meat essences, sweet milk, preserved fresh salmon, lime-juice cordial and other preparations.

GOODALL, H., *Derby*.
Levigating machine, and specimens of drugs ground thereby.

GOOSEY AND ROGERS, *Stepney, London*.
Marginal plasters.

HARGREAVE AND CO., *Manchester*.
Poison bottles.

HARVEY, REYNOLDS AND CO., *Leeds*.
Large photograph of business premises.
Fine specimens of extract from English beef.

HAYWOOD, J. S., *Nottingham*.
Model displaying elastic surgical stockings and the applications of elastic fabric.
Truss, chest warmer.

HERRINGS AND CO., 40, *Aldersgate Street, London*.
Expressed juices, officinal and non-officinal, of conium, digitalis, wild lettuce, henbane, belladonna, broom, colchicum, goose grass, taraxacum, buckthorn, buckbean, etc.

Resin of scammony, entirely free from saccharine matter most commonly found in the resin scammony of pharmacy, which in the majority of specimens is merely hardened alcoholic extractive of scammony root; scammony roots.

Ol. myristicæ express.—This oil is obtained by hydraulic pressure from crushed nutmegs; in odour it is far superior to common oil of mace.

Expressed oil of stavesacre obtained by hydraulic pressure (50 cwt. to the square inch) from the crushed seeds of *Delphinium Staphysagria*. This oil is now used in preference to the ointment in some of the London hospitals.

Resin podophyllin is now almost wholly imported from the United States, where it is obtained by a process somewhat different to that of the British Pharmacopœia. The specimen manufactured according to the B. P. process is equal, if not superior, to the imported resinoid.

Sulphate of quinine. Citrate of iron and quinine (containing an equivalent of 25 per cent. sulphate), also citrate of iron and quinine of corresponding strength, made with amorphous quina.

As the manufacture of quinine is only carried on in two or three establishments in the kingdom, we have seldom opportunities of seeing the results of the competition of English manufacture. The specimen exhibited is, we think, as good as any we have previously seen.

Specimens also of granular effervescent citro-tartrate of soda, and of powders as ground in their drug mills.

Messrs. Herrings' laboratories and drug mills are under the superintendence of Mr. C. Umney, whose name is well known to pharmaceutical chemists.

HODGINSON, KING AND Co.

Quinovate of lime, a new preparation of Peruvian bark.

Bichloride of methylene, a new anæsthetic.

HOOD AND Co., *Melbourne*. EXHIBITED BY MORSON AND SON, *London*.

No. 1 opium, from Sunbury, near Melbourne.
No. 2 „ from Gisborne, near Melbourne; rich alluvial soil, well manured.
No. 3 „ from Gippsland; rich soil, cold climate.
No. 4 „ from near Gisborne; volcanic soil.
No. 5 „ from South Yarra.
No. 6 „ from Dromana, on the shores of Port Phillip; very sandy soil.

A paper upon these specimens of opium was communicated to the Conference by Mr. Morson.

HOPKIN AND WILLIAMS, Messrs., *London*, LIST OF SPECIMENS EXHIBITED BY.

1. Mercury biniodide. 2. Bismuth citrate ver. 3. Zinc sulphocarbolate. 4. Soda sulphocarbolate. 5. Iron sulphocarbolate per. 6. Uranium nitrate. 7. Anthraquinone. 8. Iodoform. 9. Iron iodate. 10. Delphine. 11. Papaverine. 12. Ammonia tartrate (neutral). 13. Acid cinnamic. 14. Lithia citrate cryst. 15. Chloral, pure anhydrous. 16. Ditto (insoluble modification). 17. Chloral, hydrate (mass). 18. Ditto, recryst. pure. 19. Ditto, recryst. from Benzole. 20. Chloral, methylate. 21. Chloral, alcoholate. 22. Chloral, butylate. 23. Chloral, amylate. 24. Chloralide. 25. Bromal hydrate. 26. Ethylidene chloride. 27. Methyl acetate. 28. Ethyl bromide. 29. Amyl nitrate. 30. Amyl nitrite. 31. Amyl chloride. 32. Amylene bromide. 33. Amylene bibromide. 34. Benzoyl chloride. 35. Propylamine. 36. Acid chloracetic. 37. Hæmatoxyline cryst. 38. Cantharidine. 39. Curari poison. 40. Ethal. 41. Cholesterine. 42. Apomorphia hydrochlorate. 43. Tyrosine. 44. Leucine.

Notes on the above Specimens.

2. Bismuthi citr. ver. Suitable for liq. bismuthi ammon. citr. B. P. 5 grains to 1 dram nearly represents the Pharmacopœia strength: it is readily soluble in ammonia; is also quite free from copper, arsenic and other impurities.
7. Anthraquinone. Interesting as being the intermediate product between anthracine and artificial alizarine; also as one of the series of "kinones."
8. Iodoform. Now largely used as a local anodyne.
9. Iodate of iron. Lately used in medicine.
15. Pure anhydrous chloral. In liquid form.
16. „ In its insoluble form.
17. Chloral hydrate. Fused.
18. „ Recrystallized from bisulphide of carbon.
19. „ Recrystallized from benzol.
20. Chloral methylate. Combination of chloral and methyl alcohol, deliquescent.
21. Chloral alcoholate. Sometimes sold as chloral hydrate, but far less effective.
22. Chloral butylate. Possesses a very pleasant smell; insoluble in water.
23. Chloral amylate. Insoluble in water, crystallizing with great beauty; the combination of chloral with various alcohols is attended with great rise of temperature; in the case of the methyl compound, the mixture actually boils. All these compounds can be readily distilled, and thus be obtained of constant boiling-points, and quite pure.

Chloral hydrate, when distilled, gives a very white and beautiful product.

24. Chloralide. Product of the long-continued action of boiling sulphuric acid on chloral. This body differs essentially from all the other known chloral compounds, inasmuch as when treated with alkalies it yields no chloroform.
25. Bromal hydrate. Now being tried medicinally, but its action not yet fully understood. Its vapour produces a copious flow of tears.
26. Ethylidene chloride. A new anæsthetic, introduced to medicine by Dr. O. Liebreich, of Berlin.
30. Amyl nitrite. This body when pure has a remarkable effect upon the action of the heart, and has been largely used to relieve the spasm in angina pectoris; it is often improperly confounded with nitrate of amyl, a substance quite destitute of the peculiar properties of the nitrite.
35. Propylamine. One of the compound ammonias having a strong odour of herring-brine; used as a remedy for rheumatism.
36. Chloracetic acid. In crystals; a substitution representative of glacial acetic acid.
39. The Curari or Woorari poison; the arrow-poison of the South American Indians. When applied to a wound, it produces death, but may be administered internally without any ill effects,—is said to act as an antiperiodic.

HOWE, E. W. AND Co., *London*. Pure chloral; bromal hydrate; carbonate of lithia; white shellac.

HUSTWICK, T. H., *Liverpool*.

Specimens of sulpho-carbolates of ammonium, magnesium, sodium, calcium, copper, iron and zinc, also carbolic acid mouth-wash.

HUTCHINSON, JOHN AND Co., *Widnes*.

Specimens of alkali in various stages of manufacture, and samples of sulphur recovered by Mond's process.

INCE, J., *London*.

Collection of old books, illustrative of the pharmacy of the sixteenth and seventeenth centuries.

JONES, ORLANDO AND Co., *London*.

Chapman's entire Wheat-flour.

LIMOUSIN'S OXYGEN GAS INHALING APPARATUS.

Limousin's drop measures give drops of equal size and of the weight of 5 centigrammes of distilled water. A table, showing the number of drops of several fluids making one gramme, accompanies each measure.

LIVERPOOL CHEMISTS' ASSOCIATION.

Collection of 70 medicinal plants, presented to the Association by Ransom, of Hitchin.

LOWE, CHARLES AND Co., *Manchester*.

Carbolic acid crystals, a solid block weighing $1\frac{1}{2}$ cwt
Picric acid crystals.
„ paste.
Anthraquinone.
Sulphophenate of soda.
„ of zinc.
Anthracene, crude.
„ pure.
Rosolic acid, crude.
„ pure.
Naphthaline.
Disinfecting powder.

MACFARLAN, J. F., AND Co., *Edinburgh*.

Samples of opium.
Morphia and salts.
Apomorphia muriate, got by the action of hydrochloric acid on morphia.
Oxymorphine (morphine + O), new base (Matthiessen).
Codeine and salts.
„ reproduced from chlorocodide.
Apocodeine chloride, got by the action of chloride of lime on codeine (Matthiessen).
New base, got by the action of H_2SO_4 on codeine (Matthiessen).
Narceine.
Meconine, from E. opii.
„ „ opianic acid.

Meconine, from narcotine, by water.

These three specimens of meconine have precisely the same chemical composition and physical properties; hence it may be assumed that meconine is not a normal constituent of opium, but a product of the decomposition of narcotine.

Papaverine.

Thebaine.

Meconic acid.

Narcotine and products of decomposition.

New base, obtained by the action of H_2SO_4 on narcotine (Matthiessen and Armstrong).

Hydrochlorate of cotarnamic acid, a new poison (Matthiessen).

Greenheart bark and nuts.

Bebeerine sulphate (com.).

„ pure.

Marks, H., *London, Sponge Merchant.*

Fine sponge, on rock, very rare.

Finger sponge; Turkey cup and honeycomb.

Martin, F. R., *Redland, Bristol.*

Numerous specimens of alkaloids and pharmaceutical preparations, also microscopic slides of rare salts, also microscope and spectroscope.

Martindale, William, F.C.S., *London.*

Plaster-spreading apparatus, as described in the Pharmaceutical Journal, p. 33, July, 1869, with additional improvements, so that the front plate can be entirely removed and the whole cleansed with much greater ease than in the original apparatus, by the different arrangement of the screw-adjustment for regulating the thickness of the plaster.

Mason, A. H., *Liverpool.*

Specimens of artificial borax crystallized on rods.

Maw, Son and Thompson, *London.*

Collection of sundries common to the pharmaceutical counter. A great variety of syringes, magneto-electric machines, and an exceedingly fine specimen of enamelled glass, representing the Pharmaceutical arms—unfortunately broken in unpacking.

Pessary and suppository moulds, made according to the pattern designed by Mr. H. B. Brady, of Newcastle-on-Tyne.

We notice a stove designed by Mr. Groves, of Weymouth, and manufactured by Messrs. Maw and Son. It is made up of a series of Bunsen burners in three rings, mounted on a stand, which can be adjusted to any convenient height. Each ring of burners is under the control of a separate tap, there being also a tap which regulates the whole. This arrangement gives a great range of heating power, one good feature being that the gas can be lowered to the lowest conceivable point without going out, as in the case with ordinary large Bunsen burners. Up to this time a stove of the kind, adapted alike to the requirements of both large and small pharmacies, has been a great desideratum.

Mottershead and Co., *Manchester.*

A series of cheap German thermometers for laboratory use; the scale is permanently marked on a slip of milk-glass or paper, which, presenting a flat surface to the eye, is easily read off. This slip is enclosed with the tube containing the mercury in an outer strong glass tube. These thermometers are made with scales ranging from 212° to 600° F., at prices from 2*s*. upwards.

Various sets of hydrometers, conveniently arranged with trial jar, thermometer, etc., in cases.

Various forms of Bunsen's gas burners, illustrating methods of regulating the supply of air to that of gas.

Series of reagent bottles, with indestructible enamelled labels.

Funnel jackets for the filtration of fats, etc., at high temperatures.

Small apparatus for producing and keeping a constant supply of sulphuretted hydrogen for the use of chemists.

Fine wire-gauze masks for protecting the face in chemical experiments.

Improved Dobereiner's hydrogen lamps.

Benger's automatic apparatus for maintaining constant temperatures in some chemical and pharmaceutical operations. *See* Pharm. Journ. p. 252.

Forms exhibited, a drying closet and an evaporating basin.

Proctor, B., *Newcastle-upon-Tyne.*

Pill scoop.

Redford, A., *Liverpool.*

Improved pessary mould.

Richardson, R., *Cork.*

Goulding's flower and plant food.

Newnham's pure condensed milk.

Pessary mould.

Rimmel, E., *London and Paris.*

Perfume vaporizer and fountain.

Sarg and Co., *Vienna.*

Glycerine. Scented glycerine.

Solid and liquid glycerine soap.

Silicated Carbon Company.

Filters for domestic and manufacturing purposes.

Southall, Son, and Dymond, *Birmingham.*

The objects exhibited by this firm were in four parts:—

I. A collection of the officinal drugs of the Pharmacopœia of India, which are not contained in the British Pharmacopœia, 1867. These drugs were exhibited in glass jars, to which were affixed printed labels, conveying the

Botanical names,
Habitat of plant,
Officinal part employed,
Properties of ditto,
Therapeutic uses,
Recognized preparations,
And doses.

The following is a list of the whole of these drugs which this firm exhibited:—

Rusot (or Rasot). *Hind.* Watery extract from the wood and bark of species of Berberis (*non-officinal*).

Azadirachta Indica. *Nim or Margosa* Bark and Oil.

Luffa amara. *Bindaal.* Stalks of plant.

Coptis Teeta. *Coptis or Mishnu.* The dried root.

Datura alba. *Dhatura.* The leaves and seeds.

Aconitum heterophyllum. *Atís.* The dried root.

Aconitum ferox. *Bikh or Bish.* The dried root.

Diospyros embryoptera. *Gab.* The fruit.

Narcotine. Alkaloid.

Pharbitis Nil. *Kaladina.* The seeds.

Andropogon (Cymbopogon) Nardus. *Citronelle.* The oil.

Andropogon (Cymbopogon) citratum. *Lemon Grass.* The oil.

Mylabris Cichorii. *Telini fly.* The dried insect.

Carum (Ptychotis) Ajowan. *Ajwain or Omum.* The fruit.

Plantago Ispaghula. *Ispaghúl.* The seeds.

Tinospora cordifolia. *Gulancha.* The root and stems.

Butea frondosa. The seeds.

Gynocardia odorata. *Chaulmugra.* The seeds and oil.

Hydrocotyle Asiatica. *Indian Pennywort.* The leaves.

Cæsalpina (Guilandina) Bonducella. *Bonduc.* Seeds.

Citrus Bergamia. *Lime.* The fruit.

Dipterocarpus lævis. *Gurjun.* Wood oil.

Boswellia floribunda. *Olibanum.* The gum resin.

Sinapis juncea. *Rai or Indian Mustard.* The seeds.

Garcina pictoria. *Indian Gamboge.* The gum resin.

Soymida febrifuga. *Rohun Tree.* The bark.

Acacia Catechu. *Catechu.* The extract of heart-wood.

Alstonia scholaris. *Alstonia.* The bark.

Anamirta Cocculus. *Cocculus.* The dried fruit.

Punica Granatum. *Pomegranate.* The root bark.
" " " The dried pericarp of fruit.
Andrographis paniculata. *Kariyát.* The dried stalks and root.
Mucuna pruriens. *Cowhage.* The hairs of the pod.
Oryza sativa. *Rice.* The husked seeds.
Berberis. *Indian Barberry.* The root bark.
Gracilaria lichenoides and G. confervoides. *Ceylon Moss.* The dried plant.
Calotropis gigantea. *Mudar.* The root bark.

II. A case containing large specimens of eight scale preparations, and six salts of bromine and iodine manufactured by this firm, viz.:—
Ferri et Ammoniæ citras, P.B. 1867.
" " " made with iron wire.
Ferri et Quiniæ citras, P.B. 1867.
Ferri et Strychniæ citras.
Ferri citras; ferri pyrophosphas; ferrum tartaratum; bismuthi et ammoniæ citras; cadmii bromidum; cadmii iodidum; ammonii bromidum; ammonii iodidum; potassii bromidum; potassii iodidum.

III. Four tall glass jars, containing specimens of Analysed Drugs answering to the tests of the British Pharmacopœia, 1867, viz.:—
Opium, containing *at least* 6 to 8 per cent. of precipitated morphia.
Scammonium, yielding from 80 to 90 per cent. of resin.
Yellow cinchona bark, containing at least 2 per cent. of nearly pure quinia.
Pale cinchona bark, yielding not less than ½ per cent. of alkaloids.
(The importance of affixing to these (and other) drugs a guarantee of strength, so as to ensure uniformity in the administration of doses, cannot be over-estimated.)
Four other tall glass jars, containing specimens of
Oleum Morrhuæ,
Succus Taraxaci,
Oxymel Scillæ, and
Solution of Iodide of Iron.
(One fluid drachm of this solution is equivalent to one drachm of solid iodide of iron. It is readily employed in dispensing and in making the syrup of iodide of iron, which, if made with grape sugar, will keep well without decomposition.

IV. Several cases of the sixth edition of the collections of specimens of the organic materia medica of the British Pharmacopœia, 1867, for the use of medical and pharmaceutical students.

Silverlock, H., *London.*
Working model of poison cabinet, containing 40 labels of various sizes on revolving stand, only 1 label on either disc being exposed to view at once.
Labels on red ground, and distinctive collection of dispensing and trade labels.

Spence, Berger and Co., *Manchester.*
Samples of Mudie's disinfectant.
Jordan's Norway cod-liver oil.

Spence, Peter, *Manchester.*
Very fine crystals of alum, manufactured under exhibitor's patent.

Sumner, R., jun., *Liverpool.*
Nicely crystallized specimens of sulphocarbolates of zinc and soda.

Thonger and Co., *Liverpool.*
Poison labels.

Tomlinson, M., *Manchester.*
Mahogany dispensing counter with carved glass cases and mirror screen, and fitted with expedio label rack
Species jar, pedestal stand and sundries.

Watts, Dr. J., *London.*
Variety of tanning materials, with estimation of amount of tannin.
Extract of *Abies Canadensis.*

Webb, A., *Clapham.*
Herbarium—an excellently arranged collection of dry plants, for which the prize medal of the Pharmaceutical Society was awarded, October 5, 1870.

Whitthread, Mr., *Liverpool.*
Specimen of *Pistachia Lentiscus* plant, and of *Pistachia Terebinthus*, from Scio; also fine white gutta percha and pure silica.

York Glass Company.
Swan-necked show bottle, percolators, poison bottles, etc.

MEDICAL SOCIETY OF LONDON.

In a paper read lately before a crowded meeting of Fellows of the Medical Society of London, Dr. Richardson discussed the medical aspects of the germ theory. He pointed out that however medical men might differ on the question, yet there were some points in which they all agreed. They agreed that certain diseases owe their origin to what might be designated poisons, that these poisons are organic in their construction; that they can produce specific phenomena of disease; that they are communicable under certain well-understood conditions. They also agreed pretty well as to the diseases which are due to these organic poisons.

But from this common ground some turned to what may be called the vital road, others to the chemical, or to the physical, in which the vital and chemical are either correlated or considered identical.

Dealing first with the vital or germ theory, Dr. Richardson said that it arose from the analogy of the process of growth and development of plants and animals. The theory was that diseases called communicable have their origin in germs possessing the inherent property of reproduction. Within the body these germs reproduce themselves, and thereby excite disease. Outside the body they float in the air, mingled with dust, or adhere to solid substances, or are suspended in water in which they are not soluble. Owing to their vitality, it is urged they are indestructible under ordinary conditions of cold and heat, moisture and dryness. We ask from whence disease comes, and are told from a germ. We ask, what is a germ? We are told that it is a living organism, capable of reproduction; a ferment plant possessing the power of exciting fermentative changes in the human body, the disease being the sign of the fermentation; or it is a micrococcus, the spore of a fungus, which, put into a soil rich in nitrogen, multiplies by division, and becomes the cause of diseases bearing the signs of putrefaction. But there was a natural fermentation existing in the body previous to the fever. Is this, then, a new fermentation? If so, of what kind? Or, if it produces putrefaction, where is the putrefaction? The germs have been compared in their action to pepsine, but pepsine is an animal secretion, and a dependent substance. Germs are said to withstand influences which destroy the vitality of higher forms of life. If they are reproduced with such rapidity under favourable conditions, and possess such persistency of life, there would be so great an increase of them that in time the world would be depopulated. But where are the germs of such diseases as the black death, plague, sweating sickness, dancing mania, and the ague of London in the time of Sydenham and his contemporaries? Can improved sanitary conditions have any effect in destroying living reproductive germs which resist the ordinary causes of death and dissolution? Again the theory fails to account for the fact that some epidemics are most pronounced in the last quarter, and least in the second quarter of each year; that sometimes they are attended with low and sometimes with high mortality; that scarlet fever occurs most frequently between the fifth and tenth years, and with rapidly lessening frequency after the tenth year;

and the immunity from recurrence of such diseases as scarlet fever and small-pox.

The physical theory differs from the vital in that it places the reproductive force of the virus in the animal itself. It does not dispute that the poisons assume the solid form, and are carried about by water and air, but it declares their perfect destructibility. The result of experiments by Fordyce, confirmed by Chauveau,—showing that the virus of small-pox, diluted by water up to a certain point, is active, but beyond that point inert,—was explained by the germ-theorists as being caused by the mechanical distribution of the germs by the water, which lessened the certainty of inoculation. The physical theorists, besides this, assume the molecular disintegration of the particles by water. The author had found that, after diluting snake poison largely with water, not only was its power to infect destroyed, but evaporation of the water and reconcentration failed to bring it back. Dr. Richardson looks upon the poisons as organic products, particles derived from the secretions of the animal body. Thus, a person suffering from a communicable disease is poisonous precisely as a cobra di capello is poisonous,—that is to say, he produces by secretion an organic poison which, coming in contact in the right way with a healthy person, produces disease. In some cases, a change in the natural secretion is induced by direct contact with the poisonous matter, causing it, as it is poured out, to be changed into a substance the same as that which excited the action; this may either be carried away and replaced by a new and healthy secretion, in which case there is recovery, or be absorbed into the blood, exciting change there also, and so lead to disorganization of the blood and death. In other cases, the secretions themselves undergo decomposition, arising from atmospheric influences, or the constitutional tendencies of the person affected, the effects following being precisely the same as those following its introduction into the body. The author also maintained that the physical theory explains the specific character of each poison. Whatever the mode of entrance of the poison, it acted according to its nature, by making election of one particular secretion. It also explains the limitation of the poisons, for, if it be the particles of an animal secretion that become poisonous, their production and dissemination must cease with the life of the animal. This is the fact; the dead are not contagious like the living, and epidemics cease as their poisons are resolved into elementary forms of matter. He claimed also that it accords with the facts relating to the seasons, it being natural that changes in secreted fluids should be most active when there is excess of moisture in the air and coldness.

Dr. Richardson said that if the evidence of such change was insufficient, it was better than any produced for the germ theory. In the study of change of colloidal bodies by contact, the action of the different oxygens on animal fluids, the action of known organic chemical compounds such as nitrite of amyl, there was ample suggestion for experimental research on the organic poisons derived from animal bodies. In conclusion, his object had been to show that the germ theory of the origin of communicable disease was not to be accepted in one eager grasp as the absolute truth; that, beautiful as it was from analogy, and grand as it was as a generalization if it were true, it might after all be a delusion.

SOCIETY OF ARTS.

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture III.—continued.

I stated that exposure to a red heat was found by Pasteur to act effectually in destroying the vitality of these little particles, and in every case in which he used air which had been subjected to that heat, he found that the air was incapable of sowing any of these organisms in liquids even the most favourable to them. There was, however, still one remarkable exception, which was presented by the experiment of Gay-Lussac, to which I alluded some time ago. He found that when he used a mercury trough, which he selected as giving him the best condition for the purpose, he got these little cells produced from the air which had been calcined. Now, Pasteur found that mercury exposed to the air, as it is in these operations, has adhering to it a number of these little germs, and that when no more than the ordinary precautions are taken for cleansing the mercury, it has with it a considerable variety of such little organisms, which, if placed in a suitable material, develop themselves and grow quite well. He proved this in various ways. For instance, some of the little bulbs which had been sealed up whilst full of fermentable liquor and steam, and which had been kept for some time in a warm chamber, so as to be certainly free from vital organisms, were opened under mercury, so as to allow the ends of the tubes to be filled with mercury. He then lifted it up, so that nothing came into contact with the liquid but mercury, and passed into them sometimes air which had been passed through a red-hot platinum tube, and sometimes oxygen gas given off from molten chlorate, where certainly there would be nothing of organic life present, and in almost all these cases he found that organisms developed themselves. He attributed this entirely to the mercury, because when that was absent the result was the opposite. In order to prove this point more decisively, he took a liquid which was capable of decomposing, kept it for some time in a quiescent state, and then allowed a drop of mercury, in the state in which he had been using it before, to flow into it, and put the mixture into his warm chamber. He soon found that the mercury had carried in the germs of these organisms, and that they developed themselves quite well in it. Certainly any one unaccustomed to such accurate precautions could hardly have anticipated such a result as that, and a result which is, I think, most instructive, as showing what extraordinary precautions are needed, in order to prevent the entrance of these excessively small particles into the materials which we are working with. Side by side with this, I must mention another result of Pasteur's, for it was, perhaps, hardly less startling, and that was, that when, instead of taking the liquid which I mentioned to you just now, yeast-water and sugar, he took common cow's milk, or, at all events, the mixture which is sold by that name, and boiled it, with a view of destroying any organisms that might be in it, and then he sealed up the bulb while still full of steam, so that no air could get into it, and when he kept such sealed-up bulbs for some time in a warm chamber, he found clear evidences of decomposition; he found a turbidity in the substance, a curdling of the nitrogenized materials of the milk: and on taking out some of it, he found it was swarming with little animalcula; and yet he had boiled the milk for a considerable time, and had closed the vessel whilst the ebullition was still going on, so that no air could have carried the germs into it before it was closed. Still, there were the little organisms unmistakably present. He then modified his experiment in this manner. He boiled his milk at a higher temperature. I need hardly tell you how that can be done. You are, of course, aware that the temperatures at which water, or milk, or any liquid boils are different, according to the pressure which the air exerts upon it; that is to say, if you were to boil water here, and then if you were to carry it to the top of St. Paul's, and notice the temperature in each case, you would find that at the greater height it would boil at a lower temperature. If, in like manner, you carried it down to the bottom of a deep mine, and boiled it there, you would find the temperature would be higher; the greater the pressure of the superincumbent air, the higher the temperature at which any liquid boils. Pasteur wanted to make his milk boil at a higher temperature, and for that purpose he resorted to a very simple device. He had a long tube attached to the vessel in which his milk was boiling, bent over at the top, and brought down into a glass jar containing mercury to the depth of fifteen inches, or more. Of course, under these circumstances, the steam, which was being formed in the vessel, has to force its way up against the pressure of this mercury; the pressure of these fifteen inches of mercury was added to the pressure of air, and a total pressure was obtained, about half as much again as the pressure of the atmosphere amounted to. Of course, the milk had to boil at a higher temperature, corresponding to this higher pressure; and what did he find then? He proceeded, as before, with the experiment, closing the vessel while it was boiling, and not letting any air into it. He then kept it, and he found that no organisms appeared, even on keeping it a very long time; and he was, therefore, led to conclude that the milk must have contained in it some germs which could withstand the temperature at which the milk was boiling at first, but the vitality of which was destroyed by exposure to the higher temperature to which he exposed it in the subsequent experiment. He had reason for that, for other experiments had been made by himself, and by various other philosophers, which proved that many species of organisms can withstand a very high temperature without losing their vitality. In that respect, there are great differences amongst these little organisms which are remarkable and interesting, and will, no doubt, be of value to future investigations. To give you an idea of the great variety presented by them in their power of withstanding heat, I may mention, that if I were to heat the contents of this carboy, in which the alcoholic fermentation is going on, to 60° Centigrade (100° being boiling-point Centigrade), which is rather more than half, the fermentation would be completely arrested, and the yeast-cells would be killed. On the other hand, the particles in milk are capable of withstanding 100°. Pasteur connected that fact with the circumstance that milk is alkaline, whilst this liquid is acid, and, as a rule, acid liquids destroy the vitality of these organisms at a lower temperature than alkaline liquids. That is not all. There are in the particles themselves great differences in their power of withstanding heat. Amongst the experiments which are particularly remarkable in that point of view, I ought to mention some with regard to the little spores of mould, and such-like things; for instance, the *Penicillium glaucum*, and some others. M. Pasteur collected some of these; and after taking a little piece of asbestos, or mineral flax, as it is sometimes called, and heating it in a flame, so as to destroy anything adhering to it, he put it carefully into a vessel in which some of this mould was growing, and moved it about, so that a number of particles of the seed of the mould might adhere to it. He then heated the asbestos thus coated with dust to 120° C., a higher temperature than that to which the milk had been exposed; but after putting it into a liquid capable of feeding mould, he found that the mould made its appearance in considerable quantity, so that the germs of that particular organism were not destroyed by 120° of temperature. He even went higher, as far as 125°, and found that that was not enough, but a little over 125° killed them; 130° they cannot stand, so that, according to these observations, the limit appears to be between 125° and 130°.

In all the cases of which I have been speaking, the ferments (because all these organisms are in their nature and functions analogous to the common ferments) were removed from the substances which were employed before the air and such-like materials carrying the germs, were brought in contact with them.

With regard to processes for arresting fermentations and decomposition in liquids in which they are taking place, a number of observations have been made which are of considerable practical as well as theoretical importance, in relation to the results which I have been stating. Of course, mere heating, carried to a sufficient intensity, will arrest any process of fermentation or putrefaction which may be going on in a substance, and the applications of that process are, of course, exceedingly numerous and important. The only thing is, that we do not know, and it would be most hazardous to suppose that, in any particular case, we can name beforehand the temperature requisite to destroy a particular organism. If any observer were to say that he has exposed a mixture to 100°, and, therefore, the organism must be destroyed, experience would refute him; if he said he had exposed it to 110°, or even 120°, experience again would refute him; but if he had exposed it to 150°, and asserted that he must have destroyed them, it is quite possible that experience might show that there are organisms which will resist even that temperature. It would have been almost impossible, some time ago, to admit, and we could not have admitted, that these organisms would have withstood the temperature which they have been found to withstand; and, therefore, what temperature is sufficient to destroy the organism in any case must be found by experiment, and that alone. Amongst other conditions for arresting the process of decomposition or putrefaction, which are in their nature like those of fermentation, I ought to mention the process of drying. All the processes of fermentation which I have been speaking of, and all others, which I could tell you of, are accompanied by moisture. Moisture is present, and is essential to them; in fact, these little organisms are exceedingly soft, wet things; moisture constitutes a great part of their substance, and in a dry medium they cannot live, or if the substance were dried, they would be destroyed by it. Applications, therefore, of a mere drying process are amongst the most important and interesting of this class of agencies. Many of them are well known. For instance, the ordinary process of preserving fruit by means of drying it. Germs of putrefaction or decomposition may be present in the fruit; but if you merely take away the greater part of the moisture, you render the substance incapable of decomposing. Among the agents which serve for that purpose, there are some which abstract the water, not in a state of vapour, but in the liquid state; for instance, common salt. If you put a piece of fresh meat in contact with salt, or rub it over with the salt, the salt gradually absorbs the water, and draws the water out of the meat. The action is truly a drying action upon the meat, and it is effectual by a perfectly similar process to that which would go on if you exposed the meat in a dry chamber to a current of warm air. In like manner, of course, it is known to many persons that sugar is used just as salt is, to remove water from substances containing it in any quantity. If you were to rub any fruit or animal substance with a sufficient quantity of dry sugar, you would get the sugar dissolved by the water which would be removed from the materials; and amongst the observations which are made in common life, there are some which bear, in an interesting and instructive way, upon what I have been saying to you. For instance, I have heard it said that ordinary jam—fruit and sugar, which have been boiled together for some time—keeps better if the pots into which it is poured are tied up whilst hot. The observation has been so frequently made that one was inclined to think that there must be some truth in it; and I think if we admit that the paper can act as a strainer in the same way as the cotton wool, you will see at once that it must be as people suppose. Take two cases. Suppose one pot of jam, allowed to cool before it is tied down, little germs will fall upon it from the air, and they will retain their vitality because they fall upon a cool substance; they will be shut in by the paper and will soon fall to work decomposing the fruit. If you take another pot, perfectly similar, filled with a boiling hot mixture, immediately cover it over, though, of course some of the outside air must be shut in, any germs which are floating in it will be scalded, and in all probability destroyed, so that no decomposition can take place.

Amongst other materials which serve to arrest fermentation, there are several chemical agents of considerable energy, which are frequently employed for that purpose. Amongst the foremost, I ought to mention creasote, the active material of smoke; and I have no doubt that the antiseptic action which smoke is said to exert upon ourselves—because it is said that smoke is very wholesome, although I do not lean to that view myself—is due to the presence of this creasote or carbolic acid. Every one is aware that one process for preserving meat, which has long been in use, is to suspend it in a chimney in which the smoke of wood is present. The smoke of wood, like that of coal, contains this substance, or one nearly allied to it, and amongst antiseptic agents it is one of the most energetic. A small quantity of this carbolic acid thrown into that fermenting liquid would completely kill the organisms. In the same way, if I were to introduce a little sulphurous acid into any of these mixtures, I should immediately kill the organisms and arrest the fermentation. Sulphurous acid is now largely used for this purpose, being employed, in combination with lime and water, to saturate the casks in which beer is to be stored, so that the wood being impregnated with it, any germs which might find their way from the atmosphere, and set up a process of decomposition, are arrested and destroyed. Another very powerful antiseptic agent is prussic acid, one of the most powerful of poisons to all animal organisms, and it is particularly powerful in stopping the action of these ferments. Another substance, which I think is worthy of consideration, in the same point of view, is a mixture which is, to a great extent, of unknown composition. I refer to the poisonous matter which is given off in tobacco smoke. It must, I think, when present in the air, exert a very powerful antiseptic action upon these organisms. It has been shown, by the experiments of Professor Tyndall, that in the lower vessel of the lungs there are considerable deposits of the dust which floats about in the air; and we are, of course, exposed in that manner to the action of a number of the seeds of these ferments, and, for aught we know, of diseases, because many malignant diseases are attributed to processes of decomposition analogous to those which we have been considering: and they may be—and, as some persons think, are—carried by germs in the air, in the same way as those I have been mentioning. Now, any powerful substance which would kill these germs must, of course, exert a beneficial action, and when persons are exposed to the smoke of tobacco, there is no doubt that some of it enters the lung with the air which is vitiated, and that some of the smoke must be deposited in the lower passages of the lungs with these little mischievous germs, and must certainly somewhat astonish them.

I have here several little apparatus, all alike in their general arrangement; each consists of two little tables, connected together in such a way that air may be made to pass through both of them in one direction, but not in the other. A tube goes from the top of one into the liquid in the second, and the tube from this second passes on into the air; and these bottles can, by means of an aspirator, be supplied with air which has been strained through cotton wool, and no other air can pass into them. The bottles contain the same mixture which I have been talking about so much, yeast-water and sugar, a liquid which decomposes in almost any way you like, for almost all these germs live in it more or less vigorously. After the liquid was put in, it was kept boiling for a considerable time, so that there is, I trust, in the bottles no living organism whatever; in fact, I have reason to believe that any organisms which may have been there have been destroyed by the high temperature to which they were exposed. I might draw hundreds of cubic feet of air through that apparatus, and it would remain entirely unchanged. Next Monday we will resume this again. We will also examine this particular apparatus, which is exactly the same, with this exception, that after the whole had been filled in the manner I have stated, a little mould was introduced by a separate tube into the first bottle. The apparatus will be taken back to University College, where it will be put into the warm chamber, where the organisms will be developed; and I have no doubt the liquid in the first bottle will be in a state of active decomposition before the day is over. Then next week, we will draw purified air, which, by itself, has no action on the liquid, and see whether it will carry any germs into the second bottle. I have no doubt that, by Monday next, there will be enough mould upon it to enable us to perform the experiment; and I shall then also have the pleasure of telling you of some applications which M. Pasteur has made of his theoretical results to practical purposes, such as the preservation of wines and such-like matters.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY, Dr. B. W. Richardson's Lectures on Experimental and Practical Medicine, at 5 P.M.—"A Physiological View of Dialysis and of the Colloidal and Crystalloidal Construction of Animal Bodies."

WEDNESDAY, *Pharmaceutical Society of Great Britain*, at 8.30 P.M.—"Pharmacy in the United States." By Mr. R. HOWDEN. "Notes on Australian Opium." By Mr. J. S. WARD. See page 447.

THURSDAY, *London Chemists' Association*, at 9.30 P.M.—"Regulations for the Storing and Dispensing of Poisons." By Mr. H. A. TAUBMAN.

Parliamentary and Law Proceedings.

ILLEGAL STORAGE OF PETROLEUM.

Mr. Moses Beck, grocer, of Tunbridge Wells, was summoned by the Inspector of Petroleum for keeping on his premises, without a licence, petroleum which flashed when exposed to a temperature of 100°. The inspector stated that upon visiting the defendant's premises he found a quantity of petroleum in an iron tank two or three yards from the back of the house, a sample of which, when tested, flashed at 94° F. In accordance with the Act of Parliament he tested a second sample, which flashed at 92° F. Upon cross-examination he said that he put the thermometer at the bottom of the vessel.

Mr. Langham, for the defence, urged that the instrument produced, which was used by the inspector for testing, was incomplete, and that the thermometer, instead of being immersed one inch and a half in the oil, as prescribed by the Act of Parliament, had been allowed to rest on the bottom of the vessel. Consequently, since the temperature of the metal would be ten degrees higher than that of the oil, the test had not been carried out in accordance with the Act of Parliament. He also contended that the flame used, a lamp filled with spirits of wine, was not that meant by the Act, which said a "very small flame."

Mr. Redwood, Secretary and Consulting Chemist to the Petroleum Association, said that the certificate produced, stating that the oil would not flash when exposed to a temperature of 104°, was signed by him. He tested the usual percentage of the oil. He used How's apparatus. He had frequently made tests with Dr. Letheby, who used an apparatus exactly similar. The witness pointed out several details in which he considered the apparatus used by the inspector was incomplete.

The magistrates decided that the inspector had complied with all the requirements of the Act of Parliament, and that the defendant must pay a fine of 10*s.* and costs. A case for the Court of Queen's Bench was applied for and granted.—*Grocer.*

[*** Petroleum cases generally furnish amusing illustrations of the perplexity into which not only judges or magistrates, but also witnesses and lawyers may fall, when dealing with matters they do not understand. But in this respect the argument of Mr. Langham on behalf of the defendant in the above case is probably unique, for if it were admitted that the temperature of the oil was 10 degrees less than that of the metal vessel containing it, and that the higher temperature were indicated by the thermometer,—then the flashing-point of the oil—104° F.—would have appeared to be ten degrees higher than if it were tested in accordance with the Act. But the idea of such a difference of temperature existing between the oil and the metal vessel is as absurd as the argument in which it is assumed to be the case. This is another indication of the miserable confusion that reigns in all matters connected with petroleum legislation.—Ed. Ph. J.]

Sale of Patent Medicine without a Licence.

Mr. John Kennedy, a surgeon and chemist, of Bromley, Middlesex, was on Wednesday charged before Mr. Lushington, at the Thames Police Court, with selling a patent medicine without a licence. The prosecution was instituted by the Board of Inland Revenue. The defendant for many years had been duly licensed to sell patent medicines, but he had failed to renew his licence for the past year. An officer engaged for the purpose purchased of the defendant a box of Holloway's pills for 1*s.* 1½*d.* The Government stamp was affixed to the box. It was stated that the defendant had taken out a licence since the sale of the box of pills. Mr. Lushington thought the justice of the case would be fully answered by fining the defendant the minimum fine of £5, as it did not appear that any fraud was intended.

Edward Jeake, who described himself as a chemist, though his name is not on the register, was brought before Mr. Knox at Marlborough Street, on a charge of obtaining a charitable contribution under false pretences. After evidence had been given proving the offence, the prisoner entered into a long history of his life, stating that he had been in business as a chemist, and had failed through getting involved in a lawsuit about aniline and magenta. He said that when the cholera was raging in London he had been employed as medical officer at Whitechapel, that he was master of four languages, and understood the classics and mathematics. He was sorry for what he had done, and hoped the magistrate would deal leniently with him. Mr. Knox sentenced him to three months' imprisonment with hard labour.

Suicide by Nitric Acid.

An inquest was held on Friday, Nov. 25, at Camden Town, respecting the death of Mrs. Boroughs. It appeared that she had just returned from marketing and had sat down to supper with her husband, when suddenly she started from her chair, and giving a hysterical laugh rushed out of the room. Her husband followed her immediately, and found her in the bedroom drinking from a small phial labelled "Poison," which he said had been given him some time previously for an eruption on the hands. Dr. Dyer said that when he was called to see the deceased she was insensible. From the colour of the lips and mouth, he could see that she had drunk a quantity of nitric acid; there were also stains of the acid on her hands and over the carpet. She died on the second day from the effects of the poison. A verdict was returned of "Suicide while of unsound mind."—*Times.*

BOOKS RECEIVED.

The Chemists and Druggists' Almanack and Diary, 1870. London: 'Chemist and Druggist' Office, Cannon Street. From the Publishers.

A Treatise on the Nature, Cause, Cure, and Prevention of Disease, with Practical Illustrations of the Medicinal and other Uses of Hibbert's Patent Antiseptic Solutions, etc. By W. Hibbert. Manchester: John Heywood, Deansgate. 1870.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[30.]—HAIR-OIL SCENT.—*W. M. Betts* (Grantham) recommends the following:—

Artificial Essential Oil of Almonds ℥j
Oil of Lavender ℥vij
Oil of Cassia ʒij. Mix.

[36.]—EAU DE COLOGNE.—In reply to "*B. Shakerley,*" *H. H.* sends the following formula:—

℞. Ess. Limon. Opt. ʒiv
„ Berg. Opt. ʒv
Ol. Neroli Opt. ʒij
Ol. Rosmarini ʒiss
Ol. Cassiæ ♏xx
S. V. Rect. Oiv.

Macerate for fourteen days, and filter.

[39.]—LIQUOR COCCI.

Cochineal,
Salts of Tartar,
Cream of Tartar, of each 1 oz.
Alum 1 oz.
Distilled Water 8 oz.
Sugar 4 oz.

Boil the cochineal and salts of tartar in the water, then add the cream of tartar and alum and strain through muslin, afterwards filter and make up to 8 oz. Add the sugar, and dissolve by means of a gentle heat.—Arthur W. Postans.

Similar answers have been received from *H. B. N.*, *C. Robinson*, "*Vincit Amor Patriæ,*" and *W. Biggs.*

T. F. Best (Camberwell) sends the following formula, which he says will also answer for crimson ink:—

Carmine ℈j
Solution of Potash ♏xxv
Distilled Water to ℥j.

[40.]—SYR. CHLORAL HYDRATE.—Make a syrup with concentrated orange-flower water, dissolve the hydrate, and add ♏v spiritus chloroformi to each drachm.—Arthur W. Postans.

[*** Syrup of tolu, syrup of orange or orange-flower are also used, as well as glycerine or peppermint water. Perhaps the best plan is to use equal parts of a syrup and of chloroform-water. See Pharm. Journ. No. 18, p. 348. The strength of the preparation should be uniformly 10 grains to the fluid dram.—Ed. Ph. J.]

[42.]—CHILBLAINS.—Make a liniment of equal parts of—

Tincture of Cantharides
Solution of Ammonia
Soap Liniment.—Beta.

Tincture of Aconite ʒiss
Glycerine ʒij
Compound Camphor Liniment ʒivss.

Mix. To be used every night, but not if the skin is broken.—L. S.

℞. Terebinthinæ ʒss
Sp. Camphoræ,
Liq. Plumbi Subacet., ana ʒij.

Make a liniment. To be applied night and morning with a camel-hair pencil.—F. B., *Macclesfield.*

Chilblains Unbroken.

℞. Liq. Potassæ ʒiss
Potass. Cyanidi gr. viij
Aq. Camph. ad ℥viij.
Fiat lotio sæpe utend.

℞. Ol. Terebinth. ʒij
Liq. Ammoniæ ʒiss
Lin. Saponis ℥iij
Sp. Rosmarini ℥j
Aceti Dest. ℥viij
Ft. linim. sæpe utend.—C. Wanron.

In the answer given by "*Utile*" last week, "tincture of arnica mont." was misprinted "arnica root."

[45.]—WATER TEST.—The ordinary practical test is to add liq. potassæ permanganatis gtt. x to a pint of the water. Let it stand twelve hours. If the water be pure, it retains its pink colour; otherwise, it turns greenish or muddy.—H. H. P.

Mr. C. Robinson (Streatham) and *R. H. R.* (Houghton-le-Spring) recommend a similar plan.

[*** This test is extremely crude, and one that cannot be depended upon in a matter of such importance as the quality of water for domestic use.

Probably the readiest and most convenient mode of detecting the presence of organic impurity in water is that introduced by Wanklyn, and fully described in the work reviewed last August (see No. 6).

Another very good method is that suggested by Mr. Heisch in the *Journal of the Chemical Society* for October, 1870, p. 32, adding to the water a very small quantity of pure sugar, and leaving it for some time in a stoppered bottle. If the water be contaminated with any such impurity as would result from sewage contamination, there will be an influence exercised on the sugar as in fermentation, and it will be converted into butyric acid, which can be recognized by its smell. In any case, however, the testing of water is an operation requiring so much nicety of manipulation and familiarity with analytical work, that it should never be attempted by any one but a practised analyst.—ED. PH. J.]

[46.]—WEATHER-GLASS.—Take a thin glass tube, 12 inches long and ¾-inch in diameter, and fill three-fourths of it with the following solution:—

Camphor ʒij
Nitre ʒiss
Sal Ammoniac ʒj
Proof Spirit ℥ij¼.

Solve. The tube may be tied over with bladder if required.

As a sign of *fine* weather, the sediment of white flakes will settle near to the bottom of the tube, while the liquid will be quite transparent above. As a sign of *rain*, the matter will rise to the surface of the solution. At the approach of a *storm*, the matter will float on the surface of the solution in the form of white flakes, and the fluid will appear in a state of fermentation. During *frost*, the solution will present a starry appearance, and during *summer* or *hot weather* the matter will fall to the bottom as a solid substance. Several other predictions might be given, but these glasses as a rule are not to be depended upon.—VINCIT AMOR PATRIÆ.

Similar answers have been received from *T. F. Best* (Camberwell), *E. T. G.* (Bath).

In the recipe published last week from Mr. Watkinson, "proof spirit" should have been printed and not "rectified spirit," as the presence of water is required to cause a portion of the camphor to be deposited.

[49.]—EAU DE MILLEFLEURS.—In answer to *G. S.*, "*Utile*" (Boston) sends the following recipe for eau de millefleurs:—

℞. Essence of Violets lb.j
„ Jasmine ℥j
„ Bergamot gtt. xx
Otto of Rose gtt. x. M.

[52.]—COFFIN'S COMPOSITION POWDER. — *G. Wrigglesworth* (Hull) sends the following copy of Dr. Coffin's own published formula:—

℞. Pulv. Bacc. Lauri ℥iv
„ Zingib. Opt. ℥ij
„ Pini Canadensis ℥j
„ Caryophyllarum } ana ʒij
„ Pip. Cayenne }

Mix. Dose: a teaspoonful in a cup of hot water, sweetened.

Answers similar to the above have also been received from *J. Staley* (Rochdale) and *L. S.* (Stourbridge); also one from *J. Bordass* (Driffield), who gives a larger proportion of ginger and says that a large quantity is sold in his district.

[53.]—DISPENSING.—*C. F.*, Winchester. No. 21, p. 419.

A. P. S. does not think it possible to make a clear, sherry-coloured solution with the ingredients given, even with the aid of heat.

[56.]—HAIR WASH.—"*Alumen*" will find the following a good and cheap hair wash, presenting at the same time a clean appearance:—

℞. Sp. Ammon. Arom.,
Tinct. Canthar.,
Glycerinæ, ana ʒss
Aq. Rosæ ad ℥vj.

—A. B. FLETCHER, *Totton.*

℞. Pulv. Sodæ Bibor. ʒj
Potass. Carb. ʒj
Tr. Lyttæ ʒiij
Sp. Rosmarini ʒj
Aq. Camph. ℥vj
Aq. Rosæ ad ℥xx. M.

Scent with essence of bitter almonds and filter.—
G. W. P., *Manchester.*

[59.]—DISPENSING ("MAGNESIA"). No. 22, p. 437.
If the following *modus operandi* be adopted by "*Magnesia*" he will find no difficulty in obtaining a satisfactory result:—

Dissolve the quinine with a sufficiency of dilute sulphuric acid in a small quantity of the water, and the sulphate of iron in a second portion, mix the solutions, and add the sulphate of magnesia dissolved in the remainder of the water, and finally the tincture of ginger. Thus prepared, a perfect, although opalescent solution is obtained. The black precipitate referred to I have been unable to obtain, and should suspect it to be tannate of iron, from the admixture of tannin with some of the ingredients employed.— GEO. MASSON.

Charles Schmidt suggests to dissolve the gr. xij quin. sulph. in a little aq. destill., acidulated with ♏x acid. sulphur. dil., add solut. magnes. sulph. ℥iij, and having previously mixed the ʒiss tinct. zingiber. with the same quantity of aq. destill., shake together, finally dissolve the gr. xij ferr. sulph. in the mixture.

By adding a little acid. sulph. dil. (enough to effect a ready solution of quiniæ sulphas), dissolving magnesiæ sulphas, and adding the solutions together, no deposit takes place. The ingredients rubbed in a porcelain mortar, and dissolved together, give a blackish deposit. In this state the addition of a drop or two of acid. sulph. dil. produces a fine clear mixture, of course rendered opaque by the addition of tinct. zingiberis. —JOHN H. DODDS, *Walsall.*

I have prepared the prescription which "*Magnesia*" gives, but do not get a copious black precipitate. What precipitate there is is caused by the insolubility of the quinæ sulph., and what discoloration there is results from the action of the iron on the tinct. zingib. A few drops of acid. sulph. dil. will effect a solution and at the same time prevent any darkening.—A. B. FLETCHER, *Totton.*

[*** We do not see that our correspondents would be justified in adding the acid as suggested.—ED. PH. J.]

[61.]—TASTELESS PILLS.—Any information as to the method of giving a tasteless covering (non-saccharine and unaffected by exposure to air) to pills will oblige—TWO INQUIRERS.

[*** A solution of balsam of tolu and chloroform forms the best coating for pills.—ED. PH. J.]

[62.]—ARTIFICIAL TINCTURE OF MUSK. — *W. Wilson* (Devonport) wishes for a formula for making artificial tincture of musk from the oil of amber.

*** [Put into a cup fʒj of oil of amber, and add to it, drop by drop, fʒiiiss of strong nitric acid; let it stand for thirty-six hours, then separate and wash the resinous matter.—ED. PH. J.]

[63.]—GREEN FLUID FOR SHOW BOTTLES.—*W. W.* wishes for a recipe for making a good green fluid for show bottles.

[64.]—COLD CREAM.—"*Alpha*" (Sudbury) desires a good formula for making cold cream.

[65.]—CEMENT.—"*Iodi*" (Sudbury) wishes for a recipe for making diamond cement, or a transparent cement for glass, china, etc.

[66.]—CEMENT FOR INDIA-RUBBER. — "*Vulcanite*" asks for a formula for a good cement that would fasten the ends of pieces of vulcanized india-rubber together.

[67.—TINCT. PRUNI VIRGINIANÆ.—*R. H. D.* wishes for a formula for the preparation of this tincture.

Correspondence.

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

Obscure Prescriptions.

Sir,—Many—I think I may say the majority of your readers—will be pleased to see that in your Journal attention has been drawn to the slovenly method in which prescriptions are frequently written. Medical journals have for some time past been making editorial attacks upon dispensing chemists for high charges and for prescribing; but I think their attention might well be turned to a matter nearer home, viz. the present loose style of prescribing. I will put the question to any average dispenser, whether he is not continually troubled by it. The prescription is frequently carelessly written, often the terms are indefinite, and sometimes two or three pharmacopœias are mixed up together, while the dispenser is all the time subject to the Pharmacy Act. He can, therefore, only dispense comfortably when he has neither conscience nor property; the absence of the first allowing him to keep what he considers self-respect, the want of the latter enabling him to defy attempts to recover penalties.

I once lived in a surgery, and by excellent fortune was on very good terms with my master. After sending out "inf. calumb." for "mist. camph." several times, and by the law of average, *vice versâ*, I was obliged to propose that after he had "written in" I should always read the entries over to him before dispensing. After that arrangement we got on pretty well together. It was no compliment to propose such conditions to him, but what was I to do?

Unfortunately dispensers in retail cannot do this, they must either hand back the prescription or make it up by guess. Of course, if they can afford to take the first course they will return the prescription; but suppose a man is "running up hill," can he avoid the second? Why, he would at least be "thought a fool," and if he had an unscrupulous brother-chemist, the honest man would be cut out. Honesty may be its own reward, but how about paying your bills?

Now how can all this petty distress be avoided? I think by all chemists, when they have doubts about prescriptions, referring, if possible, to the prescriber, and when this is impossible, declining to dispense by mere guess. If this rule was invariably carried out it would soon remedy bad writing so far as prescriptions go; the wealthy and needy would be on the same "platform." Many will say to this proposal, "What about the patient perishing for lack of physic?" My reply is, does it differ much whether a man perishes for lack of physic, or is destroyed by having the wrong? All responsibility on this point rests with the prescriber, who is amply paid for (in these cases) unfulfilled duties.

M.P.S. by election.

Brighton, November 26th, 1870.

Sir,—I beg to thank you for the remarks made in support of my letter published in your Journal of the 12th instant. You were correct in supposing that the classical acquirements of the author of the prescriptions in question were a matter of but little interest to me. May I be permitted to advise that gentleman, if he wishes his prescriptions handed down to admiring posterity, in all their purity of true classical expression, to write them in such a manner that the real terminations may be seen without the aid of a powerful microscope!

As the author appears to consider few of the readers of our Journal "respectable" enough for him to "condescend" to answer them with civility, perhaps he will think it less "infra dig." to give an explanation of his remarkable prescriptions in the columns of the *Lancet* or some other "respectable" medical journal.

He also speculates in rather a sarcastic manner upon the amount of "lustre" I am likely to "shed" upon my "fraternity." May I be permitted to ask him—with all due respect, and with a deep sense of my own ignorance and inferiority—if his prescriptions (classical though they may be) will bring him any very great amount of "honour" from the Members of the College to which he belongs?

F. J. B., Major Associate.

Sir,—The thanks of chemists generally are due to you for your publication of Mr. W. Bradshaw's prescription. It is a *chef d'œuvre* of hieroglyphic art, and reflects the greatest honour on the profession of which its author is a member.

There can be little doubt that when a being of such talent and renown (for who amongst us has not heard of Mr. Watson Bradshaw?) descends from the lofty eminence of naval surgeon to pity and relieve the bodily sufferings of poor mortals on earth, we should be careful how we offend his dignity by daring to question any word or deed of his, no matter how obtuse it may seem to our benighted senses. Nor should we take the liberty of mentioning his great name in the same breath with a posse of silly or angry druggists. Such is the tenour of his second letter, which, indicating an almost angelic serenity of temper, effectually exposes by contrast the silly squabbles that promoted its production. What business on earth has a druggist to speak? He has no professional wrongs; he is made expressly to execute the wishes of the doctor; in case of an accident to take all culpability from him and, if need be, to bear it himself. In this case it would seem that it is Mr. W. Bradshaw who suffers wrong and injustice, as he mildly hints, because some silly and ignorant druggists—incapable of reading and dispensing prescriptions of his, couched in such concise and every-day terms, and written in such a legible and masterly style of caligraphy as the specimen published last week—have asked for an explanation of the terms used. Who can blame the ex-naval surgeon for preferring druggists to whom he has imparted the key to his Euclid, the "open sesame" of his mysteries? No doubt he does it from purely disinterested motives. But if it cannot be a matter of surprise that such a man should be contaminated by entering the arena of pharmaceutical correspondence, surely legal proceedings would be "infra dig." indeed! I trust that the publication of the prescription may have the beneficial effect of inducing some surgeons to be somewhat more explicit in prescribing. If they are plain and readable, no druggist will ever complain of their Latinity.

Norwich. T. P.

43, *Welbeck Street, Cavendish Square, W.*
Nov. 27, 1870.

Sir,—I not only complained in my letter of the incorrect Latinities imputed to my authorship, but disputed your right, *in toto*, of using my name at all, still less in the way you have permitted it to be paraded in your columns.

If your intention had been simply to assist a puzzled druggist out of the quagmire, or to discuss, on the broad basis, the advisability of "obscure prescription-writing," this might have been fully effected without my name, and thus I should have been spared the necessity of troubling you on a subject upon which I could say so much, and *par parenthèse*, whatever theories you could have advanced I am certain would not have changed my opinions; and, perhaps, to set the matter finally at rest, for I admit that it is an important subject for discussion, I contend, as an invariable rule, it is better that patients (*omnium generum*) should not know what medicines they may be taking; and if this be deemed a special feature in the management of certain cases, which I could abundantly illustrate, I consider it quite supererogatory on the part of any puzzled druggist to question the motives of any prescriber; and I am well certain of this, that any pharmacist presuming to dispense any prescription "obscurely" written, which the presenter thereof had been "distinctly" told could only be made up by an "especial" druggist designated, would be held legally liable for all consequences flowing therefrom by a British judge and jury.

I have always been consistently opposed to the writing of prescriptions in English, and, in short, I think that they cannot be made too unintelligible for the patient's benefit. A general practitioner does not edify his patient by informing him what his 6-ounce mixture contains. There are many other cogent reasons which could be urged in favour of the system which I adopt, but to which I need not now advert, but I am quite prepared to vindicate anything which I may do or advocate.

The prejudices of certain patients are so well known by medical men, that there can be no dissentient opinion in such cases as to the expediency of concealing the means that may be thought by the medical adviser indispensable for their recovery. Conceive, for example, a nervous patient, requiring a full dose of morphia, indulging his morbid fear of having that drug administered to him by refusing to take a draught containing it!

I was in the habit formerly of prescribing in the usual style, but so many cases were brought to my notice, which induced me to adopt, under certain circumstances, my present system of cognomens. One patient, a lady, had been taking 4 grains of blue pill twice a week for two years. Another, whenever he had the smallest ailment, would rush to an old prescription, for which, some time or other, he had invested a guinea, and commence to take 80 minims of liq. potassæ daily. Such practices I consider fraught with much danger to the physic-taking community, and I consider also that any check which can be imposed upon prescription-holders from getting their favourite recipes dispensed at random, ought to be rather hailed as a happy omen than otherwise.

This observation applies to all the "obscure" prescriptions which have been so eagerly thrust upon your notice; that is to say, the ingredients therein contained were only intended to be taken under my guidance, and not to be had recourse to on every promiscuous occasion. Why do not such patients go and consult another medical man when they are at a distance remote from the prescriber, and not endeavour to do a little quiet flirtation with a village chemist? It is true some disappointment must be felt, when a man, whose express function it is, cannot decipher an "obscure" prescription; but he can only, at most, suffer the loss of a stray shilling or two, whereas he might quietly allow the patient to swallow 4 grains of pil. hyd. twice a week for two years, or to take 80 minims of liq. potassæ daily, when he might require very different treatment. The practice of medicine is a grave and responsible vocation, and it is quite as desirable to counteract the random use of nocuous medicines, as it is incumbent on the man of medicine to study and know aright the uses of his various therapeutic agents; and patients themselves cannot be too forcibly reminded of this fact, that when they try to "do" the doctor, they only "undo" themselves.

WATSON BRADSHAW,
Formerly Surgeon Royal Navy.

J. W. A. (Newcastle) writing on this subject, expresses his opinion that the silly druggists with whom Mr. Watson Bradshaw professes to think it *infra dig.* to "enter the arena," would probably go through an examination on the British Pharmacopœia better than he could, and that they apparently pay more respect than he does to that important work. *J. W. A.* also thinks Mr. Bradshaw's admission that his "patients are invariably reminded they can only have their medicines compounded by the especial druggists to whom he hands them over," is one that does not do much credit to him, and is decidedly a breach of medical etiquette.

Sir,—The following prescription was this morning brought to me by one of my customers to dispense:—

. Lin. Tereb. Bellad. n.m.
Mist. Menstruments No. j. (*Sic.*)

It had been written by one who signs himself M.A. and M.D., one who professes to give "advice gratis to the poor." May I ask is it honest on the part of a physician to compel these patients to go to a particular chemist, he (the doctor) receiving a percentage upon the transaction?

Is it such a great crime for a respectable chemist to do a little prescribing when such an example is set us by our "betters"? I think not; yet, Sir, this M.A. and M.D. is one of those who would prevent us. I call such a one a hypocrite and a sham philanthropist.

Sheffield. EDWARD BARBER.

[*** We insert some of the foregoing letters more for the satisfaction of correspondents than for the sake of any light they throw upon the question originally put forward by F. J. B., and we must decline to publish any further letters which do not bear directly upon that. Perhaps Mr. Bradshaw or his especial druggists will supply this desideratum.]

As to the other subjects more or less obscurely touched upon in the above letters, it would seem that the present excitement of the political world in regard to secret treaties is contagious, and a similar state of mind is being developed among pharmacists as to the nature of the relations which *sometimes* exist between prescriber and dispenser. This is a question of great importance, and so well worthy of further ventilation that we shall recur to it at an early date.—ED. PH. J.]

BEWARE OF SWINDLERS.

Sir,—Allow me to corroborate the communication of Mr. Long in your last week's issue, respecting a man going about the country to appoint agents to sell an "Infallible Vermin Killer" for the firm he represented.

It is about six weeks since a very gentlemanly-looking sort of a fellow, elegantly plumed in the fashion of the day, drove up to my shop door with a horse and gig, of first-class appearance, of such a style and in such a good condition as would not be degrading for the use of any nobleman. This gentlemanly rascal intimated that I should seldom see travellers from any respectable firm with such a grand equipage.

He professed to represent a firm of the name of Messrs. Newman, Howard and Co., Bath Row, Birmingham, stating that he was nephew of one of the partners, and that the Mr. Howard in the firm was a near relative of the well-known Messrs. Howard and Sons, the celebrated quinine manufacturers. He showed me several advertisements in newspapers respecting the vermin killer, with agents' names appended, and said it was also advertised in the PHARMACEUTICAL JOURNAL. He also displayed some very handsome posters, with blank spaces at bottom for the insertion of agents' name. An agent's district was to comprise a circuit of five miles, in which posters and handbills were to be circulated free of expense to agent.

Other special advantages, too numerous to mention, were also offered. I purchased only half of what he seemed anxious for me to take, and after he had gone I proceeded to examine all the numbers of the PHARMACEUTICAL JOURNAL I had, but, to my surprise, failed to meet with a single word concerning the matter.

I have written twice to this celebrated Birmingham firm (?), who it appears from invoice are "Manufacturers of Chemical Preparations," but have not received any reply.

I trust my brother-chemists will be on the alert, and be able to detect these profound rogues and impostors before they are duped by them, should any present themselves in their shops.

Rawtenstall, November 14th, 1870. H. HALSTEAD.

Sir,—A letter on this subject appeared in the *Lancet* and has since been copied into several of the daily papers. It appears that one chemist charged 4*s.* for a mixture for which another charged but 1*s.* 6*d.*, and, for this act of a single man, the whole fraternity are charged with extortion. In reply, I am quite ready to admit that the charge was exorbitant, provided the mixture contained only simple ingredients; it may, however, have contained expensive articles, or have been prescribed in a concentrated form; but, probably, it was not obtained from a dispensing chemist at all, but from a surgeon or apothecary keeping an open shop; and this class of practitioners get a "very fair" profit, as the following instance may show:—

A surgeon keeping an open shop told me that he frequently got 2*s.* 6*d.* for a blue pill and black draught, the usual price charged by chemists being only 9*d.* There have been cases, too, brought before the public in which doctors' bills have been disputed solely because the patients considered they had been overcharged; but who has ever heard of a chemist's bill being disputed on this score?

Chemists are not infallible, nor are they free from extortioners and unjust men, any more than lawyers and medical men are; but, as a class, they are a hardworking, honest, thoughtful body of men,—not overpaid for their responsibility, as the scarcity of retired chemists shows,—whose services are daily becoming appreciated more freely by the public. Add to this that all now wishing to become chemists are compelled to pass examinations, and it will at once be seen that the business of a dispensing chemist in England is rapidly on its way to become a profession ranking as high as on the Continent. A DISPENSING CHEMIST.

DRUGGISTS' CHARGES.

Sir,—The *Lancet* complains of the excessive charge made by chemists for dispensing, while many of us complain of some of our brother-chemists for cutting down the prices. Mr. Applegate's letter gives a fresh illustration of the fact that we ought not to take for granted all our customers say about the prices charged by other chemists, but follow his example and firmly refuse to reduce the price because the customer says that Mr. So-and-so has charged so much less.

Reliable testimony may, however, sometimes be got concerning the prices charged by other druggists. Several weeks ago I dispensed the following prescription for a stranger:—

℞. Vin. Ipecac. ʒj
Oxymel. Scillæ,
Syr. Papav. Alb., ana ℥vij
Tinct. Ferri Perchlor. ʒj.
M. A teaspoonful every four hours in water.

The customer brought a bottle and called for the mixture an hour or so after. He asked the price of the medicine and I charged 1*s.*; he told me that Mr. —— of —— only charged 8*d.* I said that Mr. —— might do so if he liked, but I certainly could not think of dispensing the prescription at such a price; consequently he would not take the mixture. Wishing to test some of my neighbours whom I suspected of doing a cutting trade, I sent a boy *incognito* to them with a copy of the prescription to inquire how much they would charge to dispense it. One replied 1*s.*, another 9*d.*, and a third, recently elected a member of the Pharmaceutical Society, said, "If you bring your own bottle, I will make it up for 6*d.*"

An apprentice of mine saw recently in the windows of a shop less than a mile from St. Paul's Churchyard, whose owner is the proprietor of a well-known patent for gout and rheumatic pills, a printed bill stating that seidlitz powders were sold there at 4*d.* per dozen. He went in as an ordinary customer and found that their seidlitz powders were 8*d.* a box, and that by seidlitz powders at 4*d.* per dozen, 4*d.* for a dozen powders was meant, six white papers (acid) and six blue papers (salts) making six seidlitz draughts. Surely such a grossly dishonourable trick would almost call for the removal of the chemist's name from the Register.

I hope that all those who declaim so loudly against the cutting prices of others, practise what they preach, but I fear that it is not so.

S. S. Holloway.

[*⁎* Several other correspondents write in reference to the statement contained in the letter of a "Prescriber" which appeared in the *Lancet* of the 19th ult.; they suggest that it would be desirable to ascertain the ingredients of the medicine referred to, and that since the correspondent of the *Lancet* writes from personal knowledge of the case, he can, perhaps, give a copy of the prescription as well as the name and address of the dispenser. We have written to the editor of the *Lancet*, requesting his assistance in this matter.—Ed. Ph. J.]

Sir,—I think it is a pity the Pharmaceutical Journal does not print occasionally half a column of rates of prices for 10 or 8 or 6 oz. mixtures, etc. Of course every medical man knows what would be a fair price for such "mixtures," but coming with the authority of your Council, it would be something for a physician or surgeon to fall back on when he is asked questions as to prices. I remember in my quiet apprenticeship days, when I saw served out thousands of ordinary 8 oz. mixtures, 3*s.* 6*d.* average price. I remember in another place, always this 8 oz. mixture, 2*s.* 2*d.* (circumstances quite equal); but now mark the difference during the last two years. I write a prescription at Kilburn or St. John's Wood, and the chemist very properly, as I think, charges 1*s.* 8*d.* or 2*s.*; but on the miserable system of "doing a trade" at any risks, I every week find that by taking the prescription to one of the "cheap and nasty" shops off Oxford Street, near Grosvenor Square, the same 8 oz. mixture, bottle, cork, label and some quack wrapper are all given for 7*d.* or 6*d.* I know, of course, all about competition as a healthy (?) phase of trade; but I must confess I tell my patients that cheap and adulterated drugs are so common that I would prefer their getting the mixture at 1*s.* 8*d.* or 2*s.* But then we have no standard rate of prices to assure our patients that a conscientious and honourable chemist cannot give an 8 oz. mixture for 6*d.*

November 15. Charles Kidd, M.D.

Citrate of Iron and Quinine.—Mr. J. Stathers.—We have received your letter and the sample of citrate of iron and quinine; but we cannot undertake to furnish professional analyses gratuitously.

H. Rayner (Owston Ferry).—The letter and stamps have been handed to the Secretary.

W. C. H. (Brighton), who asks a question concerning chloric ether, has omitted to send his name.

"*Botanist*" (Rochester).—In the last edition of the 'Calendar' there is no such reference made.

Microscopic Examination of Starch.

Dear Sir,—Mr. Cooke's remarks on the mounting of starches for microscopic purposes, induces me to add my experiences. I have given up using old slides of starches on standards for references, having, like Mr. Cooke, found that the granules in course of time become materially altered in shape and appearance, no matter in what fluid they have been mounted. Being so satisfied of their untrustworthiness, I now prefer the trouble of preparing fresh slides as occasion requires, and mount the starches temporarily in glycerine. I have for some time used a solution of dammar in benzole as a mounting medium, its use having been suggested to me by Mr. Swan, of Newcastle-on-Tyne; but I also use and prefer for most purposes the resin of Canada balsam dissolved in benzole, prepared by evaporating the balsam over a water bath until solid, and dissolving in the benzole. This last makes a brighter and cleaner-looking solution than the dammar, and dries quite as rapidly. I have also tried with partial success a solution of pure pale yellow rosin in benzole.

Leominster, November 22nd, 1870. M. J. Ellwood.

W. H. Cotterell (Dover).—Pharm. Journ. 2nd series, Vol. X. p. 180.

"*Guaco*."—We think not.

R. Hayton Davis (Harrogate).—The only officinal preparations are the fluid extract, infusion and syrup. (See Notes and Queries.)

Messrs. M'Master, Hodgson and Co. are informed that, owing to the official character of this Journal, we are constrained not to give editorial notices of new inventions, etc., which might appear to partake of the nature of advertisements; meanwhile we shall always be glad to afford space to any communications respecting novelties which may possess general interest for the drug trade.

"*A Constant Reader*" is thanked for his communication. We were already aware of the facts to which he refers, but cannot make use of his letter, since it is anonymous.

H. H. Pollard (Ryde).—The several recipes will be indexed. We are obliged for your suggestion.

Chapters for Students.—B. C. J., Manchester, writes to say, in reference to the method of making alum described by Mr. Tilden, at page 424, that nine-tenths of the alum used is now made by the following method:—The shale of the coal-measures is calcined in long ridges, it is then put into iron vessels lined with lead, sulphuric acid from the chamber is then poured over it, and the mass allowed to digest at about 230° F. to 240° F. The temperature is kept up by steam and ammonia vapour, which are blown in, and also by a small fire underneath the pans. When the solution is strong enough to crystallize, it is drawn off into large coolers and there agitated to prevent the formation of large crystals; the alum-flour so obtained is washed and redissolved by steam, and the solution run off into crystallizing-tubes, where it remains for ten days or a fortnight; the mother-liquor is then run off, and the alum is broken up, and is ready for the market. This is a brief outline of the manufacture of alum as carried on at Mr. Spence's works at Manchester and Goole, one of the largest manufactories of this salt in the world, where 250 tons are turned out weekly.

Communications, Letters, etc., have been received from Mr. W. N. Twelvetrees (Manchester), Mr. R. W. Giles (Clifton), Mr. J. E. Howard, Mr. F. C. Maggs (Yeovil), Mr. W. Aylesbury (Weymouth), Mr. A. E. Cole (Lee), Mr. H. Pollard (Ryde), Mr. A. C. Wootton, Mr. H. B. Brady (Newcastle), Messrs. Churchill, Mr. R. C. Tichborne (Dublin), Mr. A. H. Mason (Liverpool), Dr. B. W. Richardson, Mr. J. C. Pooley (Bath), "Polio," "Medicus" (Garston), "Cortex" (Manchester), "Iota" (Southampton), "Constant Reader," "A Physician" (Oldham), "Utile" (Boston), "Exhibatur," M. P. S. (Tunbridge Wells), J. F. (Aberdeen), J. F. B. (Derby), H. (Salisbury), J. F. (Halifax), J. T. R. (Warrington), E. M., T. M. (Worksop), F. C. Wyatt (Henley).

The following journals have been received:—The 'British Medical Journal,' Nov. 26; the 'Medical Times and Gazette,' Nov. 26; the 'Lancet,' Nov. 26; 'Nature,' Nov. 24; the 'Chemical News,' Nov. 25; 'Journal of the Society of Arts,' Nov. 24; 'Gardeners' Chronicle,' Nov. 26; the 'Grocer,' Nov. 26; the 'English Mechanic,' Nov. 25; the 'Produce Markets Review,' Nov. 26; the 'Journal of Applied Science' for December. The 'Medical Press and Circular' has not come to hand for two weeks.

PHARMACY IN THE UNITED STATES.

The following is a *résumé* of the information communicated by Mr. Robert Howden, at the Evening Meeting of the Society on the 7th inst.:—

This information was obtained during a tour in which he visited New York, Boston, Albany, Buffalo, Chicago, Milwaukie, Iowa, Cincinnati, Washington, Richmond, Baltimore and Philadelphia. He proposed, first, to give a description of a chemist's shop, or drug store; then to refer to the pharmacist, his clerks or assistants, and their educational resources; and, thirdly, to give some information relating to trade customs.

The Drug Store is generally situated at the corner of a street, or as it is termed in America, the corner of a block. It has externally a handsome and commanding appearance, with large plate-glass windows. On looking at the outside from the street, it will be noticed that it is well supplied with blinds,—roller-blinds within and shop-blinds without stretching over the pavement,—and that on these blinds are inscribed in large black letters, iced soda-water, cool cream soda, polar soda, Saratoga spring water, congress water, or Ottawa beer. Large boards standing on the pavement under the stall-board plate repeat these announcements. On approaching the window an English chemist searches curiously for large specie jars emblazoned with heraldic designs, or huge show-bottles filled with many gallons of coloured waters. He will look in vain for these, as well as for framed glass tablets relating to pharmaceutical membership and to carefully-dispensed prescriptions. But he will see on the floor of the window, without any inclosure, a few toilet bottles, not always in pairs; large bottles of popular proprietary medicines in faded showy wrappers, with framed show-cards printed in coloured type explaining their merits; some French essences; two or three stray smelling-bottles, supported by many empty eau de Cologne boxes: the whole covered with yellow gauze to keep off the flies. Here it may be observed that the American shopkeeper, or merchant as he prefers to call himself, knows little of the art of displaying goods attractively in his shop window; it is a method of gaining custom altogether unpractised. The display is *within*. It is there the public are desired to see and examine, and this custom is promoted by leaving the shop window bare of goods, and exposing the interior of the store as much as possible to the throng of passengers.

On entering our typical drug store, one is struck at once by its size and its whiteness. It is much larger than chemists' shops at home, often twelve feet high and more than fifty feet deep. The floor is of white marble, the counters of the same material or painted in imitation of it, and the ceilings not whitewashed but delicately coloured in panels. Against the walls behind the counters are the fixtures and shelves that give the character to the store. These begin with drawers like our own, but from them rise at intervals of about four feet from each other handsomely-carved pilasters, their tops united by a continued massive cornice. The walls are thus divided into recesses:—The first and all alternate recesses contain shelves and bottles, those intervening are hung with plate-glass doors making glass cases, wherein are shown proprietary medicines in pint and quart bottles. It is not generally considered of importance that the shop bottles should be very near each other, or that they should be quite filled. In well-conducted pharmacies, boldly-labelled three-pint bottles may often be seen with but half a pint or a pint of tincture in them,—a surprising custom with spirits of wine costing only seven shillings a gallon! In the upper part of these shelved alcoves are occasionally to be seen imposing busts of scientific or classical demi-gods larger than life, who look down with dignified and calm approval on the useful labours below.

The first object that attracts attention upon entering a store is an imposing soda-water apparatus, built of coloured marbles and bristling with silver taps. The counters beyond, except at the farthest end where a space is reserved for dispensing, are completely covered with deep glass cases, often eighteen inches high. These glass cases contain a profusion of miscellaneous goods, hair-brushes, sponges, Paris perfumery, English toilet soaps, leather purses, union smelling-bottles with gilt caps, cigar cases, wickered bottles, foreign proprietary medicines and specialities of the house.

The arrangements for dispensing are, with a few allowances, similar to our own; as are the graduated measures, pestles and mortars and palette knives. The dispensing scales are of the finest workmanship, very superior to ours, being costly and delicate balances, sometimes with plated silver beams, inclosed in square glass cases having a lifting sash, and forming a conspicuous object at the dispensing counter.

The American pharmacist is at present a self-educated man; he is very intelligent, and extremely well-informed in all matters relating to his profession. His assistants, who are called clerks, have their ranks recruited not by apprentices, a term never used in most of the States, but from the hired boys. A lad of the age of sixteen will enter the service of a pharmacist. He takes with him no premium, but immediately receives wages, and in return sweeps the shop, dusts the bottles, cleans measures, mortars and windows, takes out medicines, cuts labels and serves soda water. After the second year of "rudiments," he is encouraged to read the United States Dispensatory, corresponding to our Pharmacopœia, and other standard works, is placed behind the retail counter where he learns the art of "serving," and by degrees, from the chief clerk, the higher art of "dispensing." If the store is within reach of any school of pharmacy, the lad attends the instruction and lectures there delivered at *the cost of his employer*.

This, it is contended, is a preferable method of making pharmacists to the English one of apprenticeships. Over and over again was it said, "I would never have any one in my employ I could not discharge." Incompetent persons are summarily dismissed, the trade relieved from their dead weight, and the capable and intelligent candidates only suffered to remain. These candidates, it must never be forgotten, have previously had the inestimable advantage of a good education provided for them by the State free of all charge to their parents. This system is thoroughly republican; a boy or a man, of never so humble an origin, may advance if he will. The road upward is broad, open and direct; made easy to travel, and maintained by all statute law, by all social law, and by the enthusiastic approbation of every citizen.

No adequate educational instruction is at present available for the young American student in pharmacy. He must teach himself. There are, however, noble exceptions at Philadelphia (of a high order), at New York, Baltimore, Boston, Chicago, St. Louis and San Francisco, where lectures are delivered during the winter evenings on materia medica, chemistry and practical pharmacy, examinations held and diplomas conferred. In every instance, except the city of Baltimore, the attendance is entirely voluntary. There are no classes for teaching Latin, a knowledge of that language being considered unnecessary, as physicians now write their "directions" in English.

Of trade customs, the most important is that the whole of the medicines prescribed by the medical profession are supplied entirely by the pharmacists. No physician, the generic term for the whole body of medical practitioners, sends out his own medicines. He invariably writes prescriptions. On the other hand, no pharmacist prescribes. He carefully and scrupulously abstains from doing so. And this is the universal and national custom in all the States, with few and rare exceptions on the part of depraved members in either profession. The effect on the welfare of pharmacy is manifest; a very large number of stores, even in country towns, dispense thirty prescriptions in a day; and in the cities some thirty, others fifty, a hundred, and even a hundred and fifty. The physician is very jealous of his prerogative, and will occasionally endeavour to prevent a pharmacist repeating a prescription unless a second fee has been received by him. That a copy should be given for the use of the patient's friends, he regards as an outrage. No prescriptions are returned to the patient, but are preserved pasted in a book, by the chemist who first dispenses them. The physician's fee is generally twenty shillings for a first consultation and eight shillings for every subsequent one; lower fees are taken from the less affluent classes. The pharmacist generally charges about sixpence an ounce for medicines, that is, three shillings for a six-ounce mixture.

The next important custom is that pharmacy is a free trade all over the United States for any one who chooses to enter its ranks. Any person may open a drug store anywhere, and boldly write over it pharmacist or apothecary. Although this state of things is greatly deplored by every respectable pharmacist, at present it is the law, with the exception of the city of Baltimore, and in a modified degree of one or two States; the only condition required by the Government being one it never suffers to be neglected, —that of taking out a licence. This is done at an annual charge of two pounds. If tobacco is sold, another licence is required, at the cost of one pound; and if spirits of wine and intoxicating beverages are dealt in, a further licence is necessary, at the cost of five pounds. All pharmacists take out an apothecary's and a spirit licence, and many a tobacco licence, thus paying to the State annually eight pounds.

Throughout the United States everything is of a high money value,—according to the common phrase, "doubled since the war." The rents paid by pharmacists form no exception to this law. In a rising country town £100 a year is a moderate rental, in the inferior and third-rate streets in the cities about the same. In the second-best streets £200 and £300 are paid in very numerous instances. In the leading thoroughfares of the chief cities, as New York, Boston and Chicago, the rents are commonly £500, and in the very best situations £750, £1000 *and even more* per annum. For these enormous rentals the landlord only lets the shops with the basement, and is most unwilling to grant a lease. The rents paid by public companies, firms and particularly by drapers, are greatly in advance of these sums.

When "everything is dear" it follows that wages and salaries must be high. A boy on first entering a drug store receives about eight shillings a week, advancing as he improves to twelve and sixteen. On becoming a clerk he receives at first £60, then £80, then £100 a year. When chief clerk £140 to £200, and in rare cases £250. In every case he has to provide his own board and lodging; for no pharmacist lives at his place of business, or supplies meals to those in his service.

The hours of business are very long all over the Union, generally from 7 A.M. to 11 P.M. There are some cities where they are from 6 A.M. to midnight, every pharmacist in these cities, without exception, observing them. An inscription over one drug store announced, "This Pharmacy open night and day." All chemists' shops are open all day on Sunday everywhere. Very few shutters are used; the inside roller blind is drawn down to shut a store, and drawn up to open it. Gas is subjected to a tax by Government, and is therefore exceptionally dear, costing in different cities from nine shillings to fourteen shillings per thousand feet.

With heavy charges to defray, the returns of a pharmacist's business are necessarily large. During the summer months heavy sums are taken for iced soda-water and other gaseous beverages. In the West, in one moderately-sized city, several pharmacists will take each £8 a day for draughts of soda-water and fruit beverages, of which £5 will be taken in the evening. In the cities this sum is exceeded. There is one apparatus in the very best situation in Boston that is well-known to return £40 a day during hot weather.

The general results of pharmaceutical trading are very high; £2000 a year is a moderate annual return. Many stores return £6000 per annum, and in every large city there is at least one, if not two, pharmacists whose returns are £12,000 a year.

The art of skilfully preparing medicines, whereby they become less nauseous in taste, more easily digestible, or more permanent and convenient in form, is largely practised under the name of "elegant pharmacy." Combinations attaining any of these results are in much request, and are welcomed eagerly by the physicians, who continually order them in their prescriptions. A large increase of business accrues to the ingenious pharmacist, not only from his own city and State, but from the whole Union. Orders for these preparations are entered one after another in an order book, from places as remote from the pharmacist's city as St. Petersburg and Madrid, Vienna and Paris, Rome and Christiania are remote from London.

In conclusion, Mr. Howden expressed his admiration of and gratitude for the cordial and generous welcome extended to him in every city by every pharmacist to whom he applied. There was invariably an earnest desire to supply abundantly every kind of information that might be thought interesting to the Society in London. He found among the large body of pharmacists in the United States many individuals eminent for varied experience, practical skill and ripened intelligence, whose matured powers, at present confined to the routine of their own stores, might, under kindly and more public circumstances, nobly contribute to the service and progress of the profession of pharmacy.

SP. ÆTHERIS NITROSI, B.P.*

BY ALFRED E. TANNER.

The process in the B. P. is the one usually known as Redwood's; it consists in distilling a mixture of rectified spirit, nitric and sulphuric acids, together with copper wire, at a certain temperature, in a glass retort, furnished with a thermometer; and in operating on the Pharmacopœial quantity, 15 fluid ounces are ordered to be drawn over, and this distillate is to be mixed with 40 fluid ounces of rectified spirit, or a sufficiency, so that the mixture may correspond to the tests for sp. gr. and percentage of $C_2H_5NO_2$, this latter being determined by means of a saturated solution of Ca Cl.

Now I have followed this process for the preparation of spiritus ætheris nitrosi ever since the Pharmacopœia was published, but have never succeeded in collecting the amount of distillate there ordered; on no occasion have I been able to produce more than about 11 fluid ounces, excepting by the addition of more nitric acid than the Pharmacopœia allows, and then the product has been too rich in nitrous ether.

I have usually found this 11 fluid ounces of distillate to contain 50 per cent. of $C_2H_5NO_2$; that is, it will show a separation of 42 per cent. when agitated in a graduated tube with double its volume of saturated solution of Ca Cl; this, then, appears to contain the whole amount of $C_2H_5NO_2$ required, viz. about 5½ fluid ounces, or 36·6 per cent. of the quantity ordered by the Pharmacopœia to be drawn over, and on mixing this with four times its volume of rectified spirit, the mixture corresponds exactly with the spiritus ætheris nitrosi of the Pharmacopœia, showing 10 per cent. of $C_2H_5NO_2$ by the Ca Cl test, and having a sp. gr. ·846.

I should mention that this 11 fluid ounces of distillate was produced within the limit of temperature ordered, viz. 180°, but by increasing the heat to 200° there was no difficulty in distilling about 4½ fluid ounces more, but that appeared to consist principally of spirit; it was not acid when first distilled, but became so in a few days. On the last occasion of preparing sp. æther. nitros., I made a few notes which may, perhaps, be interesting to some.

The quantities operated upon were those mentioned in the B. P., viz. sp. vini rect. Oj, acid nitric 3 fluid ounces, acid sulphuric 2 fluid ounces, and copper wire. These ingredients (with the exception of ½ fluid ounce of the nitric acid which was set aside to be added subsequently), were put into a glass retort, and the mixture distilled at a temperature commencing at 160° and rising to 175°. The nitrous ether began to form at 160°, which is 10 degrees lower than the point indicated in the Pharmacopœia: when the temperature had risen to 175° and about 8 fluid ounces had passed over, the boiling ceased, and no more could be distilled without exceeding the limit of temperature, viz. 180°; so the contents of the retort were allowed to cool somewhat, and the remaining ½ fluid ounce of nitric acid was added; the distillation was then continued as before and 3 fluid ounces more passed over, making together 11 fluid ounces; a fresh receiver was adapted to the apparatus and the contents of the retort heated to 200°; the distillate thus produced measured 4½ fluid ounces, and consisted chiefly of spirit; it was nearly neutral to test paper, and had very little flavour of nitrous ether, its sp. gr. was ·867. I further distilled the contents of the retort until a temperature of 220° was shown; this produced about 2 fluid ounces more of a liquid, chiefly spirit and water, having a sp. gr. ·897, this was also neutral, but had a disagreeable odour. The 11 fluid ounces of distillate above referred to was then examined and found to have a sp. gr. ·881, and showed by the Ca Cl test a separation of 42·5 per cent., thus corresponding to 50·5 per cent. $C_2H_5NO_2$. This agrees tolerably well with the calculated sp. gr. of a mixture of equal parts of rectified spirit (·838) and nitrous ether (·900), which gives ·870 as a mean; the difference between these numbers may, I think, be accounted for by the condensation which takes place on mixing.

These considerations, I think, show that there is more spirit used in the first part of the process than is necessary, or what amounts to the same thing, too little nitric acid. I think a proportionate increase of nitric acid should be used, and the distillate tested as to the amount of $C_2H_5NO_2$ it contains, and if, as in the case just mentioned, it is found to contain 50 per cent., then 1 volume mixed with 4 volumes of rectified spirit would furnish spiritus ætheris nitrosi of the Pharmacopœia strength.

On the question of keeping this compound I regret having no suggestion to offer. It seems inherent in the nature of nitrous ether, even when pure, to change rapidly, becoming strongly acid after being kept a few days. Doubtless the keeping properties of sp. nitr. are in direct proportion to its strength in ether. A 5 per cent. solution is, I think, more desirable than the present strength, and it would approach nearer to that usually sent out by the wholesale houses. I have reason to believe it is never sent out of the strength ordered in the B. P.

The only possible remedy to prevent this decomposition that I can conceive may be the introduction of some other substance which will exert a preservative influence over it. I have not made any experiments in this direction, but they are well worthy our attention. Some organic substance, such as $CHCl_3$, might possibly be of use. I see acetic ether recommended in one of the American journals of pharmacy, but can say nothing of it from experience.

Before concluding, I should like to say a word or two of a practice which I consider highly reprehensible. Most of the wholesale houses, I believe, send out what they term solutio ætheris nitrosi 1 to 7 for the purpose of making sp. æther. nit., and doubtless the confiding pharmacist considers he has got hold of a most convenient article for making this otherwise uncertain preparation. I have even heard of its being used in the proportion of ʒj for every ℥j of spiritus ætheris nitrosi ordered, and trusting to the other tinctures ordered in the mixture to make the requisite amount of spirit. I had occasion the other day to examine a sample of this preparation

* Read at a Meeting of the Liverpool Chemists' Association, Nov. 27, 1870.

procured from a respectable wholesale house. It was received in a stoppered bottle covered with yellow paper, on the label of which were the words "Solut. ætheris nitros. 1 part added to 7 parts of sp. vini rect. (56 per cent.) forms the sp. ætheris nitrosi of the British Pharmacopœia." Thus, its pretensions were very explicit indeed, informing you of the strength your spirit ought to be, and also exactly defining what the mixture would be when made. Now, as the label contained no special precaution for keeping and storing this solution, I was rather doubtful of its assertions, for a solution of this strength ought to contain 80 per cent. of $C_2H_5NO_2$; and as $C_2H_5NO_2$ boils at about 65° F., this solution must be very dangerous to store, especially in summer, and unless some special precautions were adopted; but I soon found there were no fears to be entertained on this account. The sp. gr. was found to be ·857, and the separation by the Ca Cl test about 3 per cent., thus corresponding to 11 per cent. of $C_2H_5NO_2$ instead of 80, or 1 per cent. above the strength of spirit æth. nit. of the B. P. Now, as this article is usually charged from 5*s.* to 6*s.* per lb., you will see how large a price we sometimes pay for our credulity. We ought not to allow ourselves to be imposed upon in this manner. The process of the Pharmacopœia is neither expensive nor difficult, and I strongly advocate making this and other preparations for ourselves, or, when this is not practicable, to subject them to strict examination before taking into stock. I have great suspicions of many of these concentrated preparations, and doubt not that could they all be examined with the same facility as this one, many would be found very deficient.

PATENT MEDICINE LICENCES.

The amount of duty received on these in 1861 was £5384 and in 1869 £6842. The Act now in force concerning them is the 52 George III. c. 150, which, after giving a schedule of medicines liable to the duty, proceeds to enact generally that it shall apply to "all other pills, powders, lozenges, tinctures, etc. to be used or applied externally or internally as medicaments for the prevention, cure or relief of any disorder or complaint incident to, or in anywise affecting the human body, wherein the person making, preparing, uttering, vending or exposing the same to sale hath, or claims to have, any exclusive right or title to the making or preparing the same, or which now are, or shall be prepared, uttered, vended or exposed to sale under the authority of any letters patent under the great seal, or which now are or shall be by any public notice or advertisement, or by any written or printed papers or handbills, or by any label or words written or printed, affixed to or delivered with any packet, box, bottle, phial or other enclosure containing the same, held out or recommended to the public by the makers, vendors or proprietors thereof as nostrums or proprietary medicines, or as specifics, or as beneficial to the prevention or cure or relief of any distemper, malady, ailment, disorder, or complaint incident to or in anywise affecting the human body."

Artificial mineral waters were named among the articles included in the schedule, but they were exempted by the 3 & 4 Will. IV. c. 97.

The duty on the licence is in London and Edinburgh £2, in other cities, boroughs and corporate towns 10*s.*, and elsewhere 5*s.* The stamp duty on the packet, box, etc. in which the medicines are sold is *ad valorem*, and ranges from 1½*d.* to £1. The labels bearing the stamp are prepared at the Excise Office, by an ingenious machine invented by Congreve, the proprietors of the medicines paying for that portion of the die which contains their names and addresses. These labels are issued by the Registrar of Licences at his office.

It has been lately found that imitations of the labels are made in large quantities on the Continent to cover spurious preparations in foreign markets, and some few specimens have appeared in this country. The number of persons who took out medicine licences in 1869 was 11,422 in England and 849 in Scotland. The increase in five years in the number of medicine licences granted has been 1349. The amount of duty received on patent medicines in 1869 was £66,860, being almost an increase of cent. per cent. in the last fifteen years.

THE REACTION OF POTASSIC IODIDE WITH THE OFFICINAL TRISNITRATE OF BISMUTH.

BY W. BATHURST WOODMAN, M.D., AND C. MEYMOTT TIDY, M.B.

An out-patient attending at the London Hospital was taking the bismuth mixture of its Pharmacopœia, when it was thought advisable to add iodide of potassium to the previous prescription. When she came the following time, she appeared much alarmed at a red precipitate in the mixture, which she supposed to be "red lead" purposely put in by some neighbour, the sediment having been almost colourless when she reached home. As no mention is made in the ordinary text-books of materia medica of the decomposition which takes place, although it is doubtless well known to metallurgists, it occurred to the authors to examine the reaction a little more closely. The change takes place slowly, and appears to consist in the formation of an iodide of bismuth, potassic nitrate remaining in solution. This iodide of bismuth is a dark-red substance of cubic form, and seems to be a simple iodide, which is almost insoluble both in water and in excess of potassic iodide. Some of its properties are curious. It is a very insoluble substance; for, in addition to what is mentioned above, we may add that saturated solutions of chloride of ammonium, chloride of sodium, ferrocyanide of potassium, and corrosive sublimate, do not dissolve it in any appreciable proportions. Acetic acid dissolves it slightly, without effervescence. On boiling with liquor potassæ or ammonia, the hydrated oxide of bismuth ($HBiO_4$) is produced, which is insoluble in excess of either reagent. On treating this iodide with strong nitric acid, there was active effervescence; fumes of iodine being given off, a blackish, metallic-looking substance being left, entirely soluble in spirit, which proved to be pure iodine. Acid nitrate of bismuth remained in solution, which was not precipitated by a small quantity of water, or until neutralized. With hydrochloric or sulphuric acid there was no effervescence, but iodine was again precipitated; with the latter some iodic acid was formed. Oxalic acid also decomposed the salt, setting free the iodine; the action being somewhat slower than it was in the case of the mineral acids.

A few trials of it in doses of 5 to 20 grains appear to indicate that it is not an energetic therapeutic agent, which is probably to be ascribed to its comparative insolubility.—*British Medical Journal.*

POISONING BY SNUFF CONTAMINATED BY LEAD.

The following curious case of lead poisoning, which has come under the notice of Dr. Garrod, was mentioned by him in a lecture at King's College Hospital, and is reported in the *Lancet* :—

A gentleman, a resident in India, began to suffer some time since from nervous exhaustion, anæmia, and debility of both upper extremities; he was a great snuff-taker, taking, on an average, as much as an ounce in the course of a day. He consulted several medical men in India, and they attributed his symptoms to inordinate snuff-taking. He, however, continued to take snuff and to get worse, and at last came to England to seek further advice. When Dr. Garrod saw him he discovered a blue line on the gums. His suspicions were directed to the snuff, which he found to contain a considerable quantity of lead. To ascertain whether or not the presence of lead in this specimen was an accidental circumstance, six packets were ordered from the house in Calcutta with which the gentleman had been in the habit of dealing. The snuff was contained in sheet-lead packages, which were all found to contain lead to about the same extent as the first specimen. Dr. Garrod exhibited a solution which he had tested in the following way: Ten grains of snuff were burned in a platinum capsule, and the ash was treated with nitric acid; the crystallized result was dissolved in distilled water, with the addition of a small quantity of acetic acid, and then tested with iodide of potassium, which threw down an abundant precipitate of yellow iodide of lead. The leaden packages were labelled "best brown rappee," and bore the name of a well-known English firm, from which they had been exported to India. The snuff itself was rather moist. Where it adhered to the sides of the case, it was dotted with white spots, probably consisting of carbonate of lead, formed, Dr. Garrod suggests, by the fermentation of the damp snuff. Since Dr. Garrod's attention has been directed to this subject, he has spoken to a medical man recently returned from Calcutta, who told him that he had quite lately met with three cases of lead-poisoning, which on investigation were found to be due to the use of snuff.

Sulphurous Acid.—The value of sulphurous acid gas as a disinfectant has been established by many and crucial experiments, and is generally admitted. This agent is specially recommended by medical officers of health. There is a want of convenient methods of applying it, and especially of applying it in a limited space and to a definite and measured degree. Mr. John Gamgee has called attention to the convenience of employing it as disengaged from an alcoholic solution. Cold alcohol will, he states, take up three hundred times its bulk of sulphurous acid gas. Where, for example, it is desired to saturate a box of clothing with this gas, it is sufficient to drop a certain quantity of its saturated solution of alcohol into the floor of the box, and a large definite quantity is set free by the evaporation. The suggestion is one of importance, and seems to us worthy of attention. The solution of sulphurous acid in alcohol could easily, and probably with advantage, become a general article of pharmaceutical commerce for medical and sanitary use.—*British Medical Journal.*

Baths for University College Hospital.—A complete set of ordinary and medicinal baths, the first in connection with any London hospital, is about to be erected at University College Hospital. The expense will be about £1300, of which sum £1100 has been collected through the energy of Dr. Tilbury Fox, the Physician to the Skin Department. The general bath-hall will be 30 feet by 23 feet, and have attached to it a dressing-platform 15 feet by 10 feet, and a Turkish bath 10 feet by 7 feet, into which both hot air and steam will be admissible. The hall itself will be fitted with four or five ordinary baths—hip, sit, and others—and also a large needle-bath and apparatus for douche and shower applications. In this part will also be the alkaline and acid baths. Entirely separated by a lobby and anteroom, and having a distinct entrance, will be the chamber, 15 feet by 11 feet, in which patients affected with contagious skin complaints and syphilitic eruptions are to be fumigated or otherwise treated,—the fumes from the iodine, sulphur, and mercurial medications here given, being carried away by a special pipe to the top of the hospital building. Patients suffering from contagious complaints will be kept entirely away from the place in which the simpler baths are given. Adjoining this part of the baths will be a large chamber, 7 feet by 5 feet, for disinfecting by a strong heat the clothes of such patients as are suffering from phtheiriasis.

Artificial Ice.—We learn from the *New York Times* that an ice machine, constructed on Tellier's principle, is now being exhibited in the United States. The material used is gaseous ammonia, which is liquefied by pressure. It is said that the machine will make one hundred tons a day, at a cost of four or five shillings per ton; and that the ice made by it is transparent and durable. The cooling effect of the vaporization of liquefied ammonia may be applied to chambers containing articles of food to be preserved, or refrigerators might be constructed on any scale. The holds of ships could thus be converted into refrigerating chambers with the greatest ease, offering a ready means for the conveyance of meat from one port to another in a wholesome state.

Epsom Salts.—In reply to a query propounded by the American Pharmaceutical Association, as to the best method for disguising the taste of Epsom Salt, Mr. J. W. Smith, of Nashville, suggests the following :—

℞ Liquorice Root (deprived of the outer bark), 4 oz.
Boiling water, 2 pints, or a sufficiency.

Mix and allow to strain, with occasional stirring until cold; express through muslin, adding more water, if necessary, until the residue in the strainer is tasteless; then filter and to the filtrate add 4 oz. of sulphate of magnesia. Finally evaporate to dryness over a water bath. Each ounce of the compound represents about one ounce of the crystallized salt.—*Review of Pharmacy.*

A Pleasant Remedy for Sea-Sickness.—There have been many suggestions made as to the prevention of sea-sickness, none of which have, to say the least, been found completely successful in practice. The introduction into practice of hydrate of chloral, which produces with certainty sleep for a definite number of hours, has suggested a means of escaping the horrors of a short sea-passage at least, and possibly of mitigating the most prolonged horrors of sea-sickness. To go asleep at Dover, and wake to find oneself at Calais, is a plan which, failing other expedients, has in it much promise. An ordinary dose of hydrate of chloral produces sleep usually in a quarter of an hour, and with almost unfailing certainty. Some cases just published by Dr. Doring, of Vienna, seem to show that the value of hydrate of chloral to obviate sea-sickness is very great. It produces quiet and prolonged sleep. In all the instances recorded, it seems to have been of great value even during prolonged sea-voyages, giving a good night's rest, arresting violent sickness when it had set in, and stopping the tendency to its recurrence.—*British Medical Journal.*

Explosion of an Ammonia Still.—An explosion of an ammonia still took place last week at Mr. J. Barrow's chemical works, West Gorton, Manchester, doing serious injury to three workmen. The still, which was made of iron, boiler form, and about seven inches diameter, was blown over a cottage three storeys high into a pool of water, about eighty yards distant. The three injured men were taken to the Manchester Infirmary, one of them having had his skull fractured.—*Standard.*

Carious Teeth.—M. Magilot recommends the following preparation for carious teeth :—

Chloroform	5	parts.
Laudanum	2	,,
Tincture of Benzoin	10	,,

Cotton wool saturated with this to be inserted in the cavity, and renewed until insensibility of the part is produced.—*Revue Médicale.*

[*⁎* Where the nerve of the tooth is exposed, a most efficient remedy will be found in the careful application of a very small portion of carbolic acid to the inside of the tooth.—Ed. Ph. J.]

A Phase of Pharmacy in America.—The following advertisement appears in the *Canadian Pharmaceutical Journal* :—"The United Society of Shakers, New Lebanon, New York, prepare every description of vegetable medicines of superior quality, including roots, barks, herbs, etc., packed; alcoholic extracts, solid; alcoholic extracts, fluid; aqueous extracts, solid; powdered drugs; powdered sweet herbs. In ordering goods from wholesale houses order Shaker Herbs, to secure satisfaction."

Cinchona Cultivation in Java.—In 'Flora,' for October 10th, is a communication from Professor Hasskarl on the cultivation of the cinchona in Java. He reports that the weather has been on the whole favourable, and the growth of the plants leaves nothing to be desired. The total numbers of plants grown from seeds and layers is 1,520,516; of which 1,100,983 are *C. Calisaya*, next in number come *C. officinalis* and *succirubra*, etc., very few *C. lancifolia* and *micrantha*. In addition to these, there are 870,599 transplanted plants, giving in the gross total an increase of 197,699 plants since the commencement of the year. 460 kilograms of the bark were sent to Holland in December, 1869, and were sold at from 2 to 3 florins per kilogram; 900 kilograms have since been exported, and more than 1000 are now ready. The total produce for 1870 will probably be 4000 kilograms of dry bark for exportation, besides some hundreds for use in the island. The stripping, cutting, drying, sorting, and packing are already becoming a considerable industry in the island.

[*⁎* The importation here referred to is the same as that mentioned in Mr. Howard's paper last week. There is nothing here to contravene the result arrived at by Mr. Howard, that the cultivation in Java fails to produce bark suited for *manufacturing* purposes. The why and wherefore of this remains to be discovered.—Ed. Ph. J.]

DRUG MARKET NOTES.

Although no very complete details are kept of the commerce in drugs, yet the Board of Trade returns furnish us with the approximate particulars of all the most important, and under the subordinate head of "other articles," some of the minor trade products (in the quantity point of view) are given. The "annual statement of the trade and navigation of the United Kingdom with foreign countries and British possessions for 1869" just issued, enables us to make a cursory examination of the quantities imported of the principal articles; but to make any useful comparisons, the re-exports, stocks, and current wholesale prices, would have to be given. The following statistical notes may, however, prove useful. Glancing at the principal articles for the last five years, we find that of—

Arrowroot.—The exports have averaged about 22,000 cwt.; in 1836 they reached 32,000 cwt.

Cinchona Bark.—The average imports are from 9000 to 15,500 cwt.; in 1869 they were 11,232 cwt.

Camphor.—The imports fluctuate greatly; in 1865 they were 10,755 cwt.; in the next three years they ranged from 7400 to 3700 cwt., whilst in 1869 they reached 17,480.

Galls.—The imports of nut galls have been steadily increasing from 15,964 cwt. to 25,842 in 1868, and 21,040 in 1869.

Gum Arabic.—In this gum there has been a steady increase from 46,032 cwt. in 1865 to 67,989 cwt. in 1869.

Isinglass.—The average imports have been about 3000 cwt., the figures in 1869 being 3287 cwt.

Liquorice Juice and Paste.—There has been lately a gradual increase from 27,286 cwt. in 1865 to 37,208 in 1869.

Opium.—The imports have fluctuated greatly; in 1865 they were 401,571 lbs., in 1866, 198,223 lbs., in 1867, 273,522 lbs., in 1868, 322,309 lbs, and in 1869, 219,495 lbs.

Rhubarb.—Of late the imports have been rising. In 1865 they were 129,967 lbs., then they touched 383,821 lbs. in 1866, and have since varied from 227,663 lbs. in 1867 to 358,613 lbs. in 1868, and 270,627 lbs. in 1869.

Oils.—The quantity of Castor oil has more than doubled in the five years, having risen from 20,163 cwt. in 1865 to 50,426 cwt. in 1869. Essential and perfumed oils nearly average 500,000 lbs. per annum; one-fourth of these come from Sicily, about half from India, China, and Ceylon. Of Cod-liver oil we imported last year more than 1000 tuns, but only a portion of this was for medicinal use.

Of Balsams, the imports last year of Copaiva were 171,084 lbs., of Peru, 39,153 lbs., and of unenumerated balsams 13,085.

Cantharides.—Imported in 1869, 14,785 lbs.
Cardamoms.—85,512 lbs.
Cassia Fistula.—35,882 lbs.
Castoreum.—5063 lbs.
Cocculus Indicus.—825 cwt.
Collodion.—90 gallons.
Cubebs.—23,649 lbs.
Ether.—2295 gallons.
Gamboge.—481 cwt.
Gentian.—100 tons.
Guinea grains, or grains of Paradise.—2051 cwt.
Gum Euphorbium.—138 cwt.
Jalap.—73,346 lbs.
Lemon and Lime Juice.—289,916 gallons.
Leeches, to the value of £7067.
Liquorice powder, 29 cwt., and of root, 909 cwt.
Manna.—23,911 lbs.
Mineral water.—145,326 gallons.
Musk.—23,477 ounces.
Myrrh.—535 cwt.
Nux Vomica.—3899 cwt.
Olibanum.—11,753 cwt.
Pink root.—126 lbs.
Pomatum.—31,848 lbs.
Quassia.—4442 cwt.
Quinine, sulphate of.—62,086 oz.
Sarsaparilla.—306,777 lbs.
Sassafras.—132 cwt.
Croton seed.—222 quarters.
Seneka root.—9395 lbs.
Senna.—756,956 lbs.
Sulphuric acid.—19,997 lbs.
Tartaric acid.—388,523 lbs.
Tragacanth.—1525 cwt.

The Pharmaceutical Journal.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

DRUGGISTS' CHARGES.

WE acknowledge with much pleasure the assurance given in the following note, appended to the letter addressed to the Editor of the *Lancet* last week, in reference to a letter published in that Journal:—

"We would courteously request the Editor of the PHARMACEUTICAL JOURNAL again to refer to the *Lancet* of the 19th November, where he will find that our correspondent makes no attack whatever upon druggists as a class, but merely relates a fact regarding the conduct of an individual.—ED. L."

We hope that the daily papers which also put forward this statement regarding the conduct of an individual as a sensational illustration of the extortionate character of "Druggists and their Charges," will in like manner have the fairness to administer an antidote to the poison they have supplied—no doubt unconsciously—to the public mind, and we trust to receive from our medical contemporary a statement of the name and address of the individual dispenser referred to, as well as a copy of the prescription on which the alleged overcharge was made.

A propos of this subject, it so happens that in the medical journals of last week, charges for medicine are discussed at some length—not druggists' charges, however, but those of medical men. A correspondent of the *Medical Times and Gazette* submits a system of charges specially adapted, as he thinks, for the general practitioner in the country, and he gives the following rate of charge for medicine supplied:—

		s.	*d.*
"Mixtures for adults,	℥vj (6 doses)	1	0
" "	℥viij (8 doses)	1	6
" "	℥xij (12 doses)	2	0
" "	℥xvj (16 doses)	2	6
" " children	up to ℥vj	1	0
Gargles and lotions of similar size would be similarly priced.			
Pills	from 1 to 6	0	6
"	12	1	0
Powders	from 1 to 3	0	6
"	6	1	0
Draughts	each	0	6
Blisters and plasters, 6*s.* to 1*s.*, or more, according to size.			
Ointments to ℥j, 6*d.*; ℥ij, 1*s.*"			

He then adds:—

"Although it may sound paradoxical, in a certain sense this is the basis of the system; for the prices of medicines should be the same for all classes of private patients. They should be much what the patient would pay at an ordinary druggist's; for the doctor, be it remembered, is his own druggist."

Again, in the *Journal of the British Medical Association* we find a document emanating from the Shropshire Ethical Branch, recommending a tariff of medical fees, and among other things provided for are medicines, the charges being regulated for three different classes of patients, as follows:—

"Mixtures, ℥xij.—I. 3*s.* 6*d.* to 4*s.* 6*d.*; II. 4*s.* to 4*s.* 6*d.*; III. 4*s.* to 5*s.*
" ℥viij.—I. 2*s.* 6*d.* to 3*s.* 6*d.*; II. 3*s.* to 3*s.* 6*d.*; III. 3*s.* 6*d.*
" ℥iv.—I. 1*s.* 6*d.* to 2*s.*; II. 2*s.* to 2*s.* 6*d.*; III. 2*s.* 6*d.*
Draught, ℥iss.—I. 1*s.* to 1*s.* 6*d.*; II. 1*s.* 6*d.*; III. 1*s.* 6*d.* to 2*s.* 6*d.*
When two or more are sent, a moderate decrease in the charge should be made.
Drops, ℥iss to ℥ij.—I. 1*s.* 6*d.*; II. 1*s.* 6*d.* to 2*s.*; III. 2*s.* to 2*s.* 6*d.*
Pills, xij.—I. 1*s.* 6*d.*; II. 1*s.* 6*d.* to 2*s.*; III. 2*s.* to 2*s.* 6*d.*
" vj.—I. 1*s.*; II. 1*s.* to 1*s.* 6*d.*; III. 1*s.* 6*d.* to 2*s.*
" ij.—I. 6*d.* to 1*s.*; II. 1*s.*; III. 1*s.*
Powders, vj.—I. 1*s.* 6*d.*; II. 1*s.* 6*d.* to 2*s.*; III. 2*s.* to 2*s.* 6*d.*
" iv.—I. 1*s.* to 1*s.* 6*d.*; II. 1*s.* 6*d.* to 2*s.*; III. 2*s.*
" i.—I. 6*d.* to 1*s.*; II. 1*s.*; III. 1*s.*
Blisters.—I. 1*s.* to 1*s.* 6*d.*; II. 1*s.* 6*d.* to 2*s.*; III. 2*s.* to 2*s.* 6*d.*
Gargles and Lotions.—May be charged somewhat lower than medicines proper."

We abstain at present from any comment on these propositions, and simply submit the scales of charge for the consideration of our readers.

The fact that a tariff is proposed for medicines as well as for visits, etc., would seem to indicate that medical men do not see their way to giving up the preparation of medicines. It is to be regretted that this should be the case, for there is every reason to believe it would be advantageous both to the pharmacist and to the medical man if the compounding of medicines were left solely to the former. But, in this respect, we are far less fortunate than our cousins across the Atlantic, where, as Mr. HOWDEN has shown in his account of American Pharmacy, the functions of the physician and the pharmacist are invariably kept separate. The results of that system, as described by Mr. HOWDEN, are such as to make it well worth consideration whether it would not be wise to follow the example here.

THE USE OF CHLOROFORM AS AN ANÆSTHETIC.

AT the Royal Society of Edinburgh on Monday evening Professor CHRISTISON, in proposing a vote of thanks to Mr. MILNE-HOME for his address, alluded to the notice that had been given of Sir JAMES SIMPSON. As to the discovery of chloroform, he said the history of that had never yet been fully given. When fully given, it would constitute one of the most curious instances he knew of the gradual progress of discovery. There was one link which he thought, in justice to Sir William Lawrence, he should supply, as he could do it authoritatively. Sir William Lawrence, in the summer of 1847—the same year in the November of which Sir James Simpson made his great discovery—did repeatedly employ a solution of chloroform in rectified spirit as an anæsthetic in his surgical practice, and ascertained that it was a superior agent to sulphuric ether. Had Sir William possessed that knowledge of chemistry which Sir James Simpson very properly held that every medical man should possess, he thought there was a strong probability that he would have anticipated Sir James in his great discovery. But the article had come to him recommended by the very absurd name of chloric ether. He (Dr. Christison) rather believed there was no such thing as chloric ether known; nevertheless there was an article which had been so called. It was recommended to Sir W. Lawrence under that name; it was tried under that name; and he was informed that both Sir William and his assistant saw that something more concentrated was wanted, and that they were busy considering how they might concentrate it when suddenly the discovery of Sir James Simpson came forth and put an end to their inquiries. Had they been aware that the substance in their hands was nothing else than a solution of chloroform in rectified spirit, the solution of their problem would have been very simple indeed.

SUPPLY OF DRUGS TO UNIONS.

The announcement by the Irish Poor Law Board of their intention to appoint an officer to be called a Poor Law Unions' Apothecary, who is to have the entire management of the purchase, preparation and supply of drugs to all the Irish dispensaries, seems to have given general satisfaction. The system of obtaining supplies of drugs by contract, in the absence of a skilled officer whose special duty it should be to test their quality, and to see that the contracts are fulfilled, is one so pernicious from its tendency to promote a false economy in the acceptance of low tenders, and by the encouragement it must offer to adulteration as well as all kinds of jobbery, that it hardly causes surprise when we are told that for years past complaints have been made by medical officers in respect to the quality of the drugs supplied under contract; that adulteration has frequently prevented successful treatment of patients, whilst guardians have been often imposed upon with regard to cost. The salary of £500 a year, together with a residence at the depot in Dublin, will doubtless secure a goodly number of candidates to select from, and already it is stated that an ex-Lord Mayor of Dublin is in the field.

But surely if such an appointment is likely to be beneficial in Ireland, a similar one would not be without advantage in England. We can hardly assume that in this country drugs are less liable to sophistication, or that contractors are more honourable and guardians more intelligent than in Ireland. Therefore, since the serious evils flowing from the contract system have been thought sufficient by the Irish authorities to justify their present step, we heartily agree with our contemporary, the *Lancet*, in asking Mr. Goschen to turn his attention to the matter.

If, it is argued, the cost of drugs in Ireland be £32,000, then it would amount to something like three times as much in England; and from this point of view alone it is worth while to make sure that the money is well laid out.

OBSCURE PRESCRIPTIONS.

In referring to Mr. Watson Bradshaw's statement that his patients are invariably reminded they can only have their medicines compounded by the especial druggists to whom he hands them over, and that he considers he has the right to indite his prescriptions in any mode he may deem expedient, the *British Medical Journal* remarks:—

"The mode in which a medical man frames his prescriptions is not precisely 'his own private affair'; and the particular mode of secret formulæ which Mr. Bradshaw avows himself to employ has been emphatically condemned by the whole profession."

The *Medical Times and Gazette* is of opinion that—

"If a medical practitioner chooses to write prescriptions that cannot be understood and properly dispensed by a qualified druggist, he is to a certain extent answerable for any results that may arise therefrom. When a medical practitioner under such circumstances objects to any comments that a respectable journal, in the interests of the public, may think it right to make upon his conduct, he shows his ignorance of the law. The press is for the protection and safety of the public, and would fail in its duty if it did not fairly comment upon transactions which, to say the least of them, are 'irregular.'"

We are glad to find these opinions expressed by the representatives of the medical profession, and that the practice of writing prescriptions in secret terms is condemned from a medical point of view as much as we feel it is to be condemned from the pharmacist's point of view. In this respect we are sure that the objects with which that practice is adopted cannot promote the real interests of pharmacy; indeed it is hard to say whether the pharmacist who lends himself to such a practice, and in fact makes it possible, is not even more to blame than the medical practitioner who suggests it.

The Secretaries of the Chemical Society have (by direction of the President and Council) issued a circular stating that their attention has been directed to the absence of any provision on the part of the

Society for making known to its Fellows the progress of chemistry in foreign countries, and asking for subscriptions to enable them to defray the expense of a report to be published in the monthly Journal of the Society, of all papers whatever of scientific interest, and of all the more important papers relating to applied chemistry. A sum of £272 has already been promised. Not more than one-fifth of any contribution is to be called for in one year.

Members of the trade throughout the country will doubtless be looking forward with interest to the steps taken in reference to the storing of poisons. We may state that at the meeting of Council on the 7th inst. this question was discussed, and that it took up the greater part of a long sitting. We hope soon to place before the readers of this Journal a report of the proceedings.

Among the objects of interest at the late meeting of the Pharmaceutical Society there was a specimen of the "Herbarium Pharmaceuticum," which has been prepared for the use of pharmaceutical schools and associations by Mr. Siebold, of Manchester. The want of such a collection of plants must be frequently felt by students in the provinces.

We have much pleasure in stating that Mr. Williams has been unanimously elected a member of the Council, and we do not doubt that all who know him will be equally unanimous in thinking that the place left vacant by the retirement of Mr. Brady could not have been better or more worthily filled up.

The Rev. Dr. Henry Cheetham, D.D., of Christ's College, Cambridge, Rector of Quarndon, Derbyshire, who has been appointed to the Bishopric of Sierra Leone, was consecrated in St. Paul's Cathedral on November 30th. Dr. Cheetham's original profession was pharmacy, and he resided for some years in the establishment of Mr. Harvey (now Harvey and Reynolds) at Leeds.

By the courtesy of a correspondent we are enabled to add to the list of members of the drug trade who have been elected to the office of mayor this year, the name of Mr. Robert Walker, Pharmaceutical Chemist, Maidenhead.

We learn from Messrs. Longman's Notes on Books, that it is intended to issue early in 1871, a Supplement to Watts's 'Dictionary of Chemistry,' bringing the record of chemical discovery down to the end of the year 1869. It will form a volume of about 900 pages, and many of the former contributors have consented to furnish additions to their articles. We should be glad to see this supplementary volume made annual, so as to give a permanent value to the original work.

The *Gardeners' Chronicle* announces that by the resignation of Mr. J. J. Bennett, F.R.S., a vacancy is caused in the office of Keeper of the Botanical Department of the British Museum. If the usual course be followed, Mr. Carruthers, the Senior Assistant-keeper, will succeed to the post.

Professor Bloxam has been elected to the chair of Chemistry in King's College, vacant by the death of Dr. Miller.

Dr. John Murray has been appointed assistant-physician to the Middlesex Hospital, to fill the vacancy caused by the resignation of Dr. J. Burdon-Sanderson, F.R.S.

The election of a Professor of Chemistry at St. Bartholomew's Hospital in the place of the late Dr. Mathiessen will take place on the 13th inst.

Proceedings of the Pharmaceutical Society.

EXAMINATION IN LONDON.

December 2nd, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden, and Ince.

Dr. Greenhow was present on behalf of the Privy Council.

MODIFIED EXAMINATION.

Forty-five candidates presented themselves for examination; the following passed and were registered as

CHEMISTS AND DRUGGISTS.

Ault, Reuben	Chesterfield.
Biggleston, Edwin Radford	Exeter.
Bond, Edward	Reading.
Bond, John	Okehampton.
Borman, John Henric	Upper Norwood.
Carne, Robert Harkness	Bayswater.
Chapman, Josiah Thomas	Hulme.
Dix, Thomas Henry	Croydon.
Hall, Thomas Henry	Sheffield.
Harvey, Henry	Wakefield.
Hern, William Henry, jun.	St. Austell.
Keall, Douglas	Kington.
Martin, Amelius Hare	Paris.
Moseley, Sackville Gwynne	Cardiff.
Owen, Robert Henry	Rhyl.
Pratt, Edward Jonathan	Newbury.
Pratt, Thomas Henry	Newbury.
Richardson, Alexander	London.
Sellors, Blanchard F.	Birmingham.
Smith, Allen	West Derby.
Smith, Robert John	Horselydown.
Snell, Charles Henry	Plymouth.
Steed, Robert Owen	Southwark.
Sugden, Joseph William	High Harrogate.
Targett, Charles George	Faringdon.
Taylor, Walter	Nottingham.
Wilson, Clement Fisher	Bury.

EXAMINATION IN EDINBURGH.

November 22nd, 1870.

Eleven candidates were examined—two for the Minor Examination, two for the Modified, and seven for the First, or Preliminary; the following passed and were registered:—

MINOR (as a Chemist and Druggist).

Lee, Thomas .... Salford.

MODIFIED (as Chemists and Druggists).

Parker, William George ...... Newcastle-on-Tyne.
Pool, George .... Manchester.

FIRST, or **PRELIMINARY** (as Apprentices or Students).

Bremner, Allan Hugh .... Edinburgh.
Brown, George .... Edinburgh.
Cowper, David Burgess ...... Edinburgh.
Fenton, Thomas .... Edinburgh.
McNiven, Thomas .... Edinburgh.
McParlan, James .... Glasgow.
Young, John .... Edinburgh.

PHARMACEUTICAL MEETING.

Wednesday, December 7th.

MR. HASELDEN, VICE-PRESIDENT, IN THE CHAIR.

The Secretary having read the minutes of the previous meeting, announced the following donations to the Library and Museum:—

Medico-Chirurgical Transactions, vol. 53: from the Royal Medical and Chirurgical Society,—Manual of Botany: from Professor Bentley,—Herbarium Pharmaceuticum; a collection of the Dried Plants of the British Pharmacopœia, with Index: from Louis Siebold, Esq., Lecturer on Pharmacy at Owens College, Manchester.

Professor Attfield drew attention to a slight modification in Mr. Benger's apparatus, which has already been noticed in the Pharmaceutical Journal,* for securing equability of temperature in analytical and other operations, in which gas is used as the heating agent, and in which inconvenience has often been felt by variations in the supply of gas. Mr. Benger's apparatus, it would be remembered, consisted of a tube in the shape of the letter U, introduced between the gas-burner and the source of supply. Into one limb of the U tube was inserted the gas-pipe, at the bottom of which was a narrow slit through which the gas passed, and thence by a second pipe out of the same limb of the U tube, on its way to the burner. The bottom of the slit and the bend of the U tube was closed by mercury. The other end of the U tube is connected with any chamber that is being heated; a rise of temperature expands the air in the chamber, which immediately presses on the mercury in one side of the U tube, raises it at the other end, partially closes the slit, and thus diminishes the supply of gas to the burner. Conversely, when the chamber begins to cool, the air contracts, the mercury rises in the free limb of the U tube, falls in the other, and allows a greater supply of gas to go through tho slit. It was found, however, that when this apparatus was connected with an oven such as was exhibited (about 1 foot square), having a jacket within, it was rather cumbrous and expensive; and Mr. Benger therefore proposed, as a modification, that an air-chamber of any size desired should be lowered into an unjacketed oven, or whatever apparatus was being heated. In the connecting-pipe was a small stopcock, which, being left open until the requisite temperature was attained, would then be closed, and the apparatus at once became self-acting. Another modification was to use a glass flask, or even a test-tube, which might be connected in the same way with the U tube, and lowered into any solution which it might be necessary to evaporate at a lower temperature than boiling-point, or any other fixed temperature.

* Pharm. Journ. 3rd Series, No. 13, p. 253.

The Chairman said the apparatus appeared very useful, and the thanks of the members were certainly due to Mr. Benger for bringing it forward.

Mr. Abraham said the same principle might evidently be applied, with slight modifications, to a steam apparatus.

Mr. Grove said the only objection he had seen to the apparatus when first proposed, that the air-jacket must be made very tight, seemed to be now removed, and the present modification would not only come much cheaper, but would be more easily used.

The Chairman drew attention to the collections of prescriptions which had been laid on the table by Mr. Ince, amongst the contents of which would, he believed, be found some prescriptions illustrating the paper which Mr. Howden was about to read to them on American pharmacy.

Mr. Ince said the collections which he and his friends were forming were intended to illustrate every subject connected with pharmacy; and each of the fourteen volumes on the table contained about twenty American prescriptions, taken from the different States, and illustrating the exact style of prescription which were in use in the United States. Some were written in ink, and others, as was quite as common, in pencil. These latter had been carefully preserved, to avoid the risk of their fading; so that he hoped they would, to some extent, illustrate the general subject of American pharmacy.

Mr. Abraham asked if the volumes on the table contained any of Mr. Watson Bradshaw's prescriptions.

The Chairman said he thought the specimens which had appeared in the Journal were quite sufficient.

Mr. Ince said there were four specimens of Mr. Bradshaw's prescriptions on the table.

The Chairman said a very nice collection of dried plants, labelled "Herbarium Pharmaceuticum," had been placed on the table, but he did not know the history of it.

Mr. Brown (of Manchester) said the collection in question had been forwarded to Professor Bentley, who he had hoped would have been present to explain it. In his absence, however, he might state that this collection had been prepared by Mr. Siebold, of Manchester, who had arranged about 150 of such collections, which he intended to offer for sale, principally to Pharmaceutical Schools and Associations, at £4. 4*s*. each. Such a collection had been much wanted, and since the passing of the Pharmacy Act, many inquiries had been made for such a thing, but so far as he was aware, nothing of the kind had hitherto been supplied. About two years ago, Mr. Siebold had arranged with some friends on the Continent to supply him with such plants as could not be obtained in England; and in the interval he and his friends, with no small amount of labour, had succeeded in obtaining about 150 of such sets as the specimen on the table, which consisted of about 100 plants. He did not wish in any way to advertise this matter, and much regretted that Professor Bentley was not present to give his opinion of the collection, but certainly as far as he could judge, the plants were well selected and carefully prepared.

The Chairman said the specimens seemed extremely well set up, and he would recommend the members present to examine the collection for themselves.

The CHAIRMAN then called upon Mr. Howden to address the meeting and give the results of his observations on the condition of Pharmacy in the United States.* At the conclusion of the address,

The CHAIRMAN said Mr. Howden's paper had been most valuable and interesting, and contained so much matter that he feared it would be impossible to do it justice in the way of discussion in the short time that remained. He should therefore suggest that the meeting be adjourned to the 4th of January.

Mr. HOWDEN remarked that he wished to call attention to the bottles on the table, which were specimens of American pharmacy. He did not know that they all possessed extraordinary merit, but large quantities of them were sold. He was passing one day through a laboratory when he noticed a large tub holding about 100 gallons. The proprietor said to him, "How do you filter your syrups in London?" His reply was that they did not filter them at all. His friend said, "Not filter your syrups! why I have this to filter. I make this quantity every three weeks." The process Mr. Howden thought an ingenious one. He took a cone of felt or flannel about four feet long and filled it with water containing several sheets of white filtering-paper beaten into a pulp. As the water passed away it left a deposit of paper felt on the inner surface of the filter, admirably adapted for filtering syrups. He was rather proud of it, and justly, adding that it had this further advantage, after it had been used, he set a boy to wash the paper again, when it was as good as ever. The inventor of this filter was Mr. Frank Wyeth, of Philadelphia. There were also on the table some specimens of "elegant pharmacy." There was also on the table one ingenious device, which he believed was quite new, and for which a patent had been taken out. It consisted in first mixing certain active drugs with glycerine and then with gelatine, running the mixture out into flat cakes, with little ridges separating it into squares like a chess-board, so that each square contained a definite amount of the drug, say $\frac{1}{2}$ grain of calomel, a grain of quinine, or, as in a specimen in his hand, 1 grain of ipecacuanha. In this way a medical man in the country might possess himself of portable medicines; he only had to put a few of these gelatine sheets into his pocket, and when he wanted to make a mixture, he could snip off squares with a pair of scissors, put them in a bottle, fill up with water, and his medicine was prepared. There were also pills coated with gelatine which were well deserving of notice. Also, powdered blue pill. There was also a bottle of the celebrated sweet quinine, which had been so largely advertised, and which had led to some very painful circumstances to those interested in the manufacture. He had brought over a bottle, thinking it would be interesting for the students in the laboratory to analyse it, and see of what it really was composed. Then there were some packets of what were known as "Shaker herbs," a remedy which had a great reputation in the States, and some other preparations of a similar character. He might also draw attention to an engraving of the premises of Messrs. Powers and Weightman, of Philadelphia, who were leading manufacturing chemists.

The CHAIRMAN also drew attention to a number of American photographs which Mr. Howden had collected in his travels, and which he had kindly placed on the table for inspection.

Professor ATTFIELD thought Mr. Howden had treated his subject so exhaustively, that he doubted whether there was much left for discussion. The clear and graphic way in which he had given his experience afforded much matter for congratulation that the Pharmaceutical Society had been so well represented in America during the last few months. Mr. Howden's paper had been so interesting, that it had set the speaker longing to know something of the state of pharmacy on the Pacific coast of the American Continent. By good fortune there sat by him (Professor Attfield) a gentleman who occupied, sixteen years ago, the same relative position in the very room in which they were assembled, when they were both students in what was then the laboratory. Mr. Hugh Lloyd Jones had since resided in Vancouver's Island, at Victoria, and had visited San Francisco and other places on that coast, and he had expressed his willingness to give the Society on a future occasion the results of his experience of the pharmacy of those localities.

The CHAIRMAN said he did not intend to convey that there was any room for discussion on the merits of Mr. Howden's paper, but there were many points on which he thought it would be interesting to have a few more remarks,—for instance, on the practices of their American cousins, such as expecting the public to walk inside their stores and view their goods, instead of displaying them in the window, keeping their bottles nearly empty, which would be considered a very bad sign in England and so on. Again, Mr. Howden had spoken of American scales, and he had no doubt what he said was correct, but he should like to know whether, when powders were prescribed, they were accustomed to take the precaution usual in England of weighing each separate dose, because it appeared to him that the arrangement described would not be so convenient for that purpose as the small horizontal scales in use here. There were also other matters on which he thought useful information might be elicited by discussion.

Mr. WOOLLEY (Manchester) said he had much pleasure in proposing a vote of thanks to Mr. Howden, for he had rarely listened to a paper with so much interest; and he was very glad to have the opportunity of learning so much of pharmacy on the other side of the water. He thought it most desirable to adjourn the discussion.

Mr. BROWN (Manchester) seconded the motion. He very frequently came in contact with American citizens, and had heard somewhat of the conditions under which pharmacy was carried on in America, and the difficulties which attended the business there, but he had never received anything like the information which had been so pleasantly conveyed by Mr. Howden. He had listened with very great pleasure to the details which had been given by Mr. Howden, and thought many of them would form interesting subjects for discussion on another occasion.

The resolution having been carried unanimously,

Mr. HOWDEN, in acknowledging the compliment, said he had not gone so much into detail as he could have wished, as it was very difficult to condense the experience of six weeks into an hour, but he should be happy to attend the adjourned meeting, and if he could give any additional information it would afford him much pleasure to do so.

The meeting was then adjourned to Wednesday, January 4th.

Provincial Transactions.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The Weekly Meeting of this Association was held on Thursday evening, November 17th; the President in the chair. A very interesting and instructive discussion took place upon the prescribing of "Medical Practitioners." A paper on Water was also read by Mr. Atkinson.

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* A *résumé* of Mr. Howden's address will be found at p. 461.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The First General Meeting of this Association was held on Thursday evening, November 17, in the Lecture Hall of the Mechanics' Institution, Bath Street; the newly elected President, Mr. Thomas Davison, M.P.S., in the chair. There was a good attendance; several new members were elected. The Treasurer announced that the following donations had been received towards the funds of the Association:—From Dr. A. M. Robertson, 10*s.*; the Glasgow Apothecaries' Company, £3. 3*s.*; James Taylor, Esq., £1. 1*s.*

The President briefly introduced Roger Hennedy, Esq., Professor of Botany, Andersonian University, who delivered a highly interesting and instructive lecture, entitled "The Histology of Plants." The lecture, which treated principally of cell-growth in the structure of plants and elicited frequent applause, was illustrated by drawings, etc., of the plants in their various stages of growth. At the conclusion, a hearty vote of thanks was awarded Mr. Hennedy for his lecture, who in reply stated he purposed following up the same subject in his next lecture.

A special General Meeting of the Association was held on the 23rd November, in the Garrick Hotel, to hear the report of the Committee appointed at a previous meeting to look out for a more suitable and permanent place of meeting. On the report being presented, it was unanimously resolved, on the motion of Mr. Kermath, to accept the offer made by the managers of the Andersonian University.

Mr. Kermath then gave notice that at next general meeting he would bring forward a motion to the effect that a price list be compiled for prescriptions, that it be issued by the Association, and that every effort be made to get the members of the profession in the city and neighbourhood to abide by it.

The Secretary then stated that as the rules, etc., of the Association were now considered to be a little out of date, and as he considered the removal of the Society to George Street, where it would be under the wings, as it were, of Anderson's University, a fitting opportunity for remodelling its constitution, he would at the next General Meeting bring forward a new code of rules, etc., for the approval of the members.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Third General Meeting of the Session was held, November 24th, 1870; the President, Mr. John Abraham, in the chair. The minutes of the previous meeting were read and confirmed.

Mr. James Agnew and Mr. W. T. Warhurst were elected members.

Mr. E. Davies, F.C.S., exhibited a bulb filled with a mixture of chlorine and hydrogen; on being exposed to the action of magnesium light the two gases combined to form hydrochloric acid gas with a loud report.

Mr. A. E. Tanner read a paper upon "Spiritus Æther. Nitrosi, B.P."*

In the discussion which followed—

Mr. Hilditch said that by mixing the 11 ounces which first distilled over (containing, as Mr. Tanner had said, 50 per cent. of nitrous ether) with 44 ounces of rectified spirit, a solution was obtained containing 10 per cent. of nitrous ether, and much sweeter than when the 15 ounces was distilled over and mixed with 40 ounces of spirit, he having always found that the latter part of the distillate had a very disagreeable smell.

Mr. Rawland stated that in manufacturing sp. æther. nit. B.P. in large quantities, he generally produced from 65 per cent. to 75 per cent. of the given distillate at the given temperature, but by an increase of temperature at this point he drew over the required quantity; he could not understand why a concentrated solution could not be made.

The President said that he had always succeeded in producing the required quantity of the first distillate, and he thought the Pharmacopœia process a very satisfactory one; the only modification he could suggest would be that the acid should be added in even more than two portions. He stated that it was the opinion of Mr. Hanbury that sp. æther. nit. B.P. was an acid preparation from the very first; he (the President) thought that the instructions given in the Pharmacopœia were so simple that every chemist should manufacture his own,—he did not see any necessity for a concentrated solution.

A discussion followed in which several members took part.

The President thanked Mr. Tanner for so ably bringing the subject before the meeting, and called upon Mr. Charles Sharp for his communication on "Some Recent Analysis of Cosmetics."

Mr. Sharp brought before the notice of the meeting a report recently made by Dr. Chandler, Chemist to the Board of Health of New York, on the presence of lead in a large number of hair restoratives, enamels, skin powders, etc.

The report referred to an inquiry which arose out of some cases of lead palsy occurring in the practice of a medical man in New York, which were traced to the use of a cosmetic known as "Laird's Bloom of Youth."

Dr. Chandler found that the preparations he examined contained acetate and carbonate of lead, corrosive sublimate and bismuth, in variable quantities. In all the hair restoratives lead was present, the skin powders were comparatively harmless, the enamels, however, were of a very deleterious character.

The following gives the result of analysis, showing the quantity of salts of lead in each fluid ounce:—

1.	Clark's Restorative	0·11
2.	Chevalier's Life for the Hair .	1·02
3.	Circassian Rejuvenator . . .	2·71
4.	Hair Vigour	2·89
5.	Wood's Hair Restorative . . .	3·08
6.	Hair Restorer of America . .	3·28
7.	Gray's Hair Restorative . . .	3·39
8.	Phalon's Vitalia	4·69
9.	Vegetable Ambrosia	5·00
10.	Mrs. Allen's Hair Restorer . .	5·57
11.	Indian Hair Tonique	6·29
12.	Sicilian Hair Renewer	7·13
13.	Physiological Hair Regenerator .	7·44
14.	Martha Washington's Restorer .	9·80
15.	Singer's Hair Restorative . . .	16·39

Mr. Blair said that a mixture of hydrochlorides of aniline and copper formed a very successful hair-dye; it was largely used by workmen employed in manufactories of anilines, and it was found impossible to prevent their using it; in fact, when aldehyde green was discovered, they were so infatuated with it, that they dyed their hair green. He thought that a solution of Hofmann's violet (which is perfectly neutral and soluble in glycerine) would form a good mixture for dyeing the hair black.

In reply to the President, Mr. Blair said this mixture would stain the ki n.

A discussion followed, in which the President, Messrs. Tanner, Sharp, Blair and T. F. Abraham took part.

The Secretary asked the members to inform him of any miscellaneous communications they wished to make, so that they could be announced upon the circulars calling the meeting, and then those who felt disposed could come with the subject considered beforehand; he moved a vote of thanks to the contributors of the communications, which was carried unanimously.

The President announced that it was proposed to hold a Conversazione in January, 1871, and that Professor

* See page 463.

Roscoe had signified his willingness to attend to give a lecture.

The announcement was received with acclamation by the members present and the meeting adjourned.

ABERDEEN ASSOCIATION OF ASSISTANT CHEMISTS AND DRUGGISTS.

At the Half-yearly Meeting of the Aberdeen Association of Assistant Chemists and Druggists, held in the St. Nicholas Lane Hall, on Thursday, 24th ult., the following were elected office-bearers for the next six months:—*President*, Mr. Donald; *Vice-President*, Mr. Tocher; *Treasurer*, Mr. Barron; *Secretary*, Mr. Gordon; *Committee*, Messrs. Cassil, Maitland, Hosil, Lunnan and Joss. This Association still continues to flourish with all its former interest and vigour; its roll is still as full, and the state of its financial matters is very healthy.

During the last six months several valuable and interesting papers have been delivered by various of its members, some upon objects connected with the drug trade, and others upon more general subjects, about which it no less behoves the young chemist to understand something, even in this age, in which pharmaceutical education is so much talked of.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETINGS OF EXECUTIVE COMMITTEE.

October 5th, 1870.

In connection with the recent Annual Meeting at Liverpool a letter was read from the Local Committee, begging that the offer of a grant of money, which had been made by the Conference, as usual, to defray the expenses of the Meeting and Exhibition, might be recalled, a considerable surplus being already in hand. The Executive Committee, after some discussion in which the liability of the Conference for such costs was fully confirmed, acceded to the request, and the General Secretaries were instructed to convey to the Local Committee at Liverpool the formal thanks of the Executive Committee for the highly successful, liberal and judicious manner in which the objects of the Conference had been fulfilled and advanced by the Chairman, Secretary and every other member of the Liverpool Committee.

Mr. James Collins was elected Assistant-Secretary and Sub-Treasurer for 1870-71.

The following gentlemen were reappointed a Committee of Publication for the proposed Year-Book of Pharmacy:—Messrs. Carteighe, Groves, Hanbury, Ince and Stoddart, with Professor Attfield as Secretary.

Messrs. Cruse, Hayland, Garle, Henderson, Hopkin, Bell, Hall, Flood, Tryer and Kent, were elected members of the Conference.

December 7th, 1870.

The Year-Book Committee reported that two hundred pages of the volume were already in type, and that the other three hundred would be printed in about a fortnight. The work had been delayed in August and September, owing to the serious illness of the editor, Mr. Brough. Hoping against hope, arrangements were postponed until help became essential. The manuscript had been completed and the book conducted through the press by Mr. Joseph Ince.

The Transactions of the Conference, edited, as hitherto, by the General Secretaries, would be bound up with the Year-Book.

Messrs. Davies, Knowles, Curtis, Cocking, Clarke, Hartt, Howman, Gregory, Thomas and Breton were elected members.

⁎ Members joining during the current year, June 30th, 1870, to June 30th, 1871, and paying the annual subscription, five shillings, will be entitled to one copy of the Year-Book. Gentlemen desiring membership are invited to send in their names and addresses, legibly written, to the Secretaries, Professor Attfield, 17, Bloomsbury Square, London, W.C., or Mr. R. Reynolds, Briggate, Leeds.

ROYAL SOCIETY.

The series of experiments undertaken by Dr. Parkes and Count Wollowicz, with the object of ascertaining the effects of pure alcohol and brandy on the human body, a report of which was laid before the Royal Society last May,* has been followed by another series in which the experimenters have investigated the effects of claret of good quality. On the whole the results arrived at are very nearly identical with those of the former experiments. There was a marked increase in the action of the heart and an acceleration of the pulse, coinciding nearly with the effect produced by pure alcohol; there was no unequivocal alteration of temperature in the axilla or rectum, no alteration in the elimination of nitrogen, no alteration in the phosphoric acid of the urine, some augmentation of the free acidity of the urine: no alteration of the alvine discharges. They think that claret wine, in doses of ten to twenty ounces daily, cannot be distinguished in its effect from pure alcohol. They do not go so far as to say that the dietetic effects of red Bordeaux wine and of dilute alcohol are identical; but the difference between them must be sought in their effects on primary digestion and assimilation. The influence of the sugar, of the salts, and of the acidity, must also be ascertained by other methods than those adopted by them. As to the quantity which might be thought moderate, ten ounces of wine, containing about one fluid ounce of pure alcohol, did not cause the least unpleasant feeling of heat or flushing to a robust and healthy man to whom it was given, but twenty ounces caused him to feel uncomfortable, the face was somewhat congested, and he was a little drowsy. With regard to this man taking any alcohol at all, they were decidedly of opinion that he would be better without it, as his heart naturally acts quickly and strongly enough. He had gone through the Abyssinian campaign, and stated that when the force was without rum, owing to a deficiency of transport, he had not felt the want of the stimulant, although some of his comrades did.

LINNEAN SOCIETY.

At the Meeting of this Society on Dec. 1st a paper by Dr. Hance was read, "On the Source of Radix Galangæ minoris of Pharmacologists." The source of the Greater Galangal has long been known to be *Alpinia Galanga*, Linn., that of the Lesser Galangal has been more obscure. Galangal is not used in English medical practice, and on the Continent has become almost obsolete; its export from China is, however, considerable, and is rapidly increasing, as the following table will show:—

	lb.	Value.
1867	112,000	£478 0 7
1868	177,641	1206 13 5
1869	370,800	3046 16 9

During an expedition to the island of Hainan, a quantity of the root which furnishes the Lesser Galangal was observed exposed to the sun in baskets. On a subsequent occasion the plant itself was discovered at a spot six miles inland, at an elevation of 100 feet above the sea, growing in a dry red soil, the result of volcanic action. Here it is evidently planted, but was subsequently detected growing wild in jungles in the same island; 20 or 30 stalks spring from each root, but rarely more than one or two bear flowers. The fruit appears to be the bitter

* Pharm. Journ. 3rd Series, Vol. I. p. 136.

kind of cardamom figured by Mr. Hanbury. The plant is closely allied to *Alpinia calcarata*, which flowers readily in the Calcutta Botanic Gardens; but was determined by Dr. Hance to be a perfectly distinct and well-defined species, to which he gave the name *Alpinia officinarum*. A diagnosis of the species was given by Dr. Hance.

ANDERSONIAN UNIVERSITY MEDICAL SCHOOL.

At the opening of the Winter Session of the Medical School at the Andersonian University, Glasgow, on November 26, Dr. Thorpe, late of Owens College, Manchester, the recently-appointed Professor of Chemistry, delivered the introductory lecture. There was a large attendance. In the absence of the President, the chair was taken by Mr. Harvey.

The Chairman said the institution had been fortunate in the possession of men of great talent. To go back, they had, in the first instance, Dr. Ure, then Dr. Gregory, Dr. Graham, and lastly, one not the least among them, Dr. Penny. He trusted that the selection of Dr. Thorpe, whom he had now the pleasure to introduce to the audience, would be equally fortunate. Dr. Thorpe had done much for the science, young as he was, and he (the Chairman) trusted he would live still further to extend that knowledge which he had already brought before the world, and which was worthy of older men, and that he would be able to produce something of value to his students.

Dr. Thorpe took the opportunity of expressing the deep sense of his obligation to the trustees of the institution, who had elected him as successor to men whose names gave an imperishable lustre to science and the history of that place. He continued—No one could be more profoundly sensible than I am of the high honour which has thus been conferred upon me, and no one more keenly alive to the great responsibility which is thus attached to my office. And although I feel how utterly it is beyond my power even to attempt to extend the boundaries of chemical science as did Graham, or the range of chemical literature like Gregory, or to emulate the power of clear and lucid exposition possessed by my predecessor, Dr. Penny, I trust that I may not be found wanting in the desire to show forth the labours of these and other men, conscious that by so doing to the best of my ability, I shall reap the approbation of your trustees, and obtain the cordial co-operation of my colleagues. Thanks to the untiring exertions and zeal of the late Professor Penny, the chemical reputation of this place has become a thing to be highly prized; and I assure you, gentlemen, that it will be my constant effort, so far as I am able, to cherish and maintain it. But, to turn now to my more immediate subject, I feel that it would be in the highest degree presumptuous in me to attempt to give you anything like the usual address on occasions of this nature. Fully impressed with the truth and wisdom of the old maxim, "Ne sutor ultra crepidam," and acting under the advice of some of my colleagues, I wish rather to confine myself to the subject with which I am connected, and attempt to indicate to you the province of the science which I have the honour to teach.

Dr. Thorpe then proceeded to give an address upon modern chemistry, which we purpose printing as soon as we have space.

THE ST. ANDREW'S MEDICAL GRADUATES' ASSOCIATION.

On Friday and Saturday, the 2nd and 3rd inst., the members of this Association met at the Freemasons' Tavern; Dr. Richardson, the President, took the chair on the first day. Several honorary members were elected.

The Treasurer's and Council reports having been read, Dr. H. Day, of Stafford, was elected President, while Dr. Richardson, the retiring President, was elected to the new office of President of the Council.

Dr. Whitmore read a paper on "Sanitary Defects and Sanitary Needs of the Day," giving statistics to prove that in the last thirty years there has been no decrease, but rather an increase in the rate of mortality, especially during the last ten years, in which sanitary reforms have been most actively carried out. This he attributed to the fact that sanitary enactments were frequently a dead letter, whilst density of population and other causes of disease have much increased.

Dr. Richardson delivered an eloquent address on "The Future of Physic," in which he said that he had been led to think that it would be a pleasing and useful task to construct a history of the science of medicine in the Victorian era. In carrying out this idea, a vista of the future of medicine had often presented itself, of the course that medical science will take under the influence of change of thought respecting the physical forces of the universe, giving rise to the question, What can we who now exist do for the future? At present we live in uncertainty; we appear to dabble with questions of legislation without teaching or influencing the legislator, trusting to Government protection for the right to apply our skill instead of throwing away the oppressive shield it loans to us. He advocated the complete isolation of medicine from the trammels of such legislation as leads to useless and endless attempts to put down quacks by the power of the law. The influence of a William Harvey does more to reform medicine than all the medical reformers that ever lived. One of the first things required is the simplification of the language used by medical men. The bringing into use of a simple and reasonable scientific language would be an important service rendered to physic. It is essential also that some alteration be made in training our sons for the medical profession. The necessity of revising and extending our methods of observation was then alluded to, and the enlarged field of research opened up by recent discoveries. In the future of physic, too, it would be only according as the good of the community was sought rather than that of the individual, that the prosperity of the profession would be secured.

A report of the Second Annual Meeting of the Ashton and Dukinfield Chemists' Association has been received, too late for insertion, in consequence of having been wrongly sent to the publishers instead of the editor.

MEETINGS FOR THE ENSUING WEEK.

Monday, *Medical Society*, at 8 p.m.
London Institution, at 4 p.m.—"On Chemical Action" (Educational Course). By Professor Odling.
Tuesday, *Royal Medical and Chirurgical*, at 8.30 p.m.
Photographic Society, at 8.30 p.m.
Wednesday, *Society of Arts*, at 8 p.m.
Microscopical Society, at 8 p.m.
Thursday, *Royal Society*, at 8.30 p.m.
Linnean Society, at 8 p.m.
Chemical Society, at 8 p.m.
London Institution, at 7.30 p.m.—"On Count Rumford and his Philosophical Work." By W. M. Williams.
London Chemists' Asssociation, at 9.30 p.m.—"The Waste Products of the Pharmacopœia Processes." By G. Brownen.

Obituary.

We regret to have to record the death of Mr. Charles Coles, Pharmaceutical Chemist, of Hampstead, which happened on December 1, after a few days' illness, from inflammation of the lungs. The deceased gentleman, who was always ready to render any service to the Pharmaceutical Society, attended at Bloomsbury Square for the last time upon the occasion of the late election of the annuitants on the Benevolent Fund, when he signed the report as one of the scrutineers.

Reviews.

A Manual of Botany: including the Structure, Functions, Classification, Properties, and Uses of Plants. By Robert Bentley, F.L.S., etc. Second Edition. J. Churchill and Sons. 1870.

An Elementary Course of Botany, Structural, Physiological, and Systematic. By Professor Arthur Henfrey, F.R.S., etc. Second Edition, revised and in part re-written by Maxwell T. Masters, M.D., F.R.S., etc. Van Voorst. 1870.

One chief use of botanical text-books must always be as a companion and aid to a course of lectures; and we trust that the publication within the same year of new editions of such important works as Balfour's Class-book, Bentley's Manual, and Henfrey's Elementary Course, is a sign of an increasing demand for instruction in botany. Not that a good text-book will necessarily handle a subject in precisely the same manner as it will be discussed in a good course of lectures. We hold that the right mode of treatment varies under the two circumstances. A text-book must always start from the very commencement of the subject, taking for granted that the learner is entirely ignorant of it, and proceeding to unfold it step by step in logical sequence. The lecturer has the great advantage that he can soon form an estimate of the intelligence of his class, and moreover can often demonstrate by a single reference to the specimens with which his pupils are supplied, what will take pages to explain. He will hence frequently be able to make allusions to points of structure and to phenomena, the detailed explanation of which is deferred to a later period of the course.

In Professor Henfrey's 'Elementary Course of Botany' the subject is handled in much the order that it should be in a course of lectures: first comes the morphology of each separate organ in succession, the root, stem, leaves, etc.; then the principles and systems of classification; then the physiology and minute structure; and finally, geographical and geological botany. But, admirable as this programme is in the lecture-room, it fails to a certain extent in the text-book; and we doubt whether it would be possible for a learner unaided to gain an adequate knowledge of botany from this work. To take an instance, very early in the book we are told that "adventitious roots take their origin from the cambium-region, lying beneath the epidermis, rind, or bark of the stem, and break their way out through this." Now this sentence would be quite unintelligible to the learner, inasmuch as it is not till several hundred pages further on that he will find any explanation of what is meant by the term "cambium-region." The lecturer would, on the other hand, be able in a few words to give such explanation as would be sufficient for his present purpose. The able editor of this edition, Dr. Masters, has evidently frequently been hampered by the divergence of his own views from those of Professor Henfrey, and the work consequently loses something in unity. Some parts also have not been sufficiently brought down to the present time. It might have been better to have omitted all reference to vegetable palæontology than to have retained such a bald and incomplete outline as we find in the seven pages devoted to the subject.

The relative value of scientific text-books lies so much in the general mode of treatment rather than in the descriptive details, which are now almost uniformly accurate and reliable, that we can do little more than contrast the two works before us in the former respect. Professor Bentley commences on the more logical plan of tracing the vegetable structure from its simplest form; describing first the cell as an individual, tracing it through its various forms and degrees of complexity, to the different kinds of tissue and the contents of cells, and hence proceeding to the various organs of plants, their structure and functions. This plan has the advantage that it leads the student step by step from the known to the unknown; and the book can be used in the study as well as the lecture-room. The work being intended especially "as a practical guide to the properties and uses of plants," we find, following the description of each Natural Order, an account of its medicinal or economic properties, with a history of any species of special importance. This department contains a large amount of information indispensable to the pharmaceutist, which he will not find in so convenient a form elsewhere.

The best plan to give an idea of the completeness of the 'Manual' as a Handbook of Botany, will be simply to recapitulate the headings of the chapters. The first book, Organography, or Structural and Morphological Botany, embraces general morphology of the plant (simply introductory); elementary structure of plants, or vegetable histology, including the cell as an individual, and the kinds of cells and their connection with each other; organs of nutrition or vegetation, the stem, root, and leaf; organs of reproduction, the inflorescence, floral envelopes, stamens, pistil, fruit, ovule and seed; general morphology or theoretical structure of the flower; and reproductive organs of Cryptogams. The second book, Systematic Botany, or the Classification of Plants, includes systems of classification; and the arrangement, character, distribution, properties, and uses of the Natural Orders. The third book, Physiology, embraces special physiology, including the physiology of the elementary structures, physiology of the organs of nutrition, and physiology of the organs of reproduction; and general physiology, or the life of the whole plant, including food of plants and its sources, life of the whole plant or the plant in action; and special phenomena of plant life.

The very large amount of information useful to students or practisers of pharmacy will be illustrated by the following quotation of the properties and uses of the Order Marantaceæ:—

"The rhizomes of some species contain starch, which, when extracted, is extensively employed for food. One species has been described as possessing aromatic and stimulant properties; this, if true, is a marked departure from the general properties of the Order, for one of its distinctive characters from *Zingiberaceæ* is usually considered to be the absence of such qualities.

"*Canna.*—One or more species of this genus yield *tous-les-mois*, a very pure and useful starch, now largely consumed in this country and elsewhere. The exact species of *Canna* from which this starch is obtained, is not positively known; it is said to be *C. edulis*, but it is just as probable to be derived also from *C. glauca* and *C. Achiras*. A rhizome called 'African Turmeric,' from its resemblance in appearance and properties to ordinary commercial turmeric, has been described by Dr. Daniell in the Pharmaceutical Journal. The plant producing it is said to be the *Canna speciosa* of Roscoe. It requires further investigation. The seeds of *C. indica* are commonly known under the name of Indian Shot, from their black colour and hardness, etc. The seeds of this and other species are made use of as beads. The rhizomes or tubers of some species are eaten as a vegetable.

"*Maranta. M. arundinacea.*—The rhizomes or tubers of this plant contain a large quantity of starch, which, when extracted, constitutes West Indian arrowroot, one of the purest and best known of the amylaceous substances used as food. As this arrowroot is now obtained from *M. arundinacea* in other parts of the world besides the West Indies, it is best distinguished as Maranta starch. It forms a very firm jelly, and is, perhaps, the most palatable and digestible starch known. The name arrowroot was originally applied to this plant from the fact of its bruised rhizome being employed by the native Indians as an application to the poisonous wounds inflicted by their arrows. The name arrowroot has since been given to various other starches used as food in this country and elsewhere. *M. ramosissima* is also used in the East Indies for obtaining arrowroot."

It will be seen from this epitome and extract that we have here a complete *vade mecum* on all subjects connected with the physiology and pharmaceutical properties of the vegetable kingdom. The size of the volume is so convenient that it ought to be in the hands of every student and every practitioner.

The Manual is now so well known that we need dilate no further on its merits, more than to welcome this second edition. If we may venture a hint to all writers of similar works, we would ask why it is necessary to muddle the brains of a student by describing at length half-a-dozen old worn-out systems of classification, which have now fallen entirely into disuse, and might well be consigned to oblivion.

THE NATURAL HISTORY OF COMMERCE, with a Copious List of Commercial Terms and their Synonyms in Several Languages. By JOHN YEATS, LL.D., F.R.G.S., F.G.S., etc., assisted by several Scientific Gentlemen, pp. xvi. 436. Illustrated with Meyen's Botanical-Geographical Map. London, Cassell, Petter and Galpin. 1870.

The subject of technical education is one of great importance, and though a book like the one before us is not calculated to aid those intending to practise pharmacy in the acquisition of technical knowledge of a high standard as is now with them a legal necessity, yet the dissemination of such information as it contains amongst the less specially educated classes is a matter of interest to all, and the well-being of the country at large is affected for better or for worse as its rate of diffusion is greater or less.

On the Continent trade education is well looked to by the respective governments, and books are published with the specific object of enlightening the future merchant or artisan on the characters and properties of the substances which he will have to trade in or manipulate. The author in his Introduction, speaking of the technical schools of Leipzig, Antwerp, Berlin and Amsterdam, says:—

"In them the future Dutch or German merchant is taught to look beyond the limits of the Zollverein, and to regard the world at large as a vast storehouse, with the contents of which he must make himself familiar. At school he studies the sources of supply for the goods he must hereafter deal in. A counting-house, he is told, is a place in which he will be expected to *use* his knowledge, and *not to seek it*. He is first made acquainted with the laws and conditions of soil and climate, and then brought into contact with specimens of produce from the different kingdoms of nature; these he is required to examine and describe methodically."

The book is divided into four parts, viz.:—I. Geography of the Home Country, the adjacent Continent, our Colonial Dependencies and Foreign Trade Connections (pp. 1–125); II. Commercial Products of the Vegetable Kingdom (pp. 128–255); III. Commercial Products of the Animal Kingdom (pp. 257–348); and IV. Raw Mineral Produce (pp. 349–385). These, again, are subdivided into other divisions.

In Part I. there is much useful information on the geographical aspect of the question, which will, doubtless, prove of great use. We should have been sorry indeed if all reference to the geography of the subject had been omitted. The dearth of such knowledge is great; even amongst those who have received a fair education, it is often exceedingly vague. After giving some account of the home products, the foreign produce is treated of, and the flora and fauna of the zonal divisions indicated. From the fact that this part received the revision of Professor Hughes, its accuracy may be relied on.

In Part II., to which we shall more especially address ourselves, we have the subject subdivided into two parts; FOOD PLANTS and INDUSTRIAL AND MEDICINAL PLANTS; the former distributed under seven classes, and the latter under ten.

Amongst the cereals we fail to find any good account of rice, though it is imported in vast quantities into this country for home and foreign consumption. There is a poor account of Bengal rice, none of its many varieties being mentioned. No mention is made of Madras, of Rangoon, of Necransie (called Arracan after being cleaned), of Bassein, or of Siam rices.

In the account of *Ceratonia siliqua* we read "supposed to be the locust bean on which St. John the Baptist fed." This should have received greater qualification by the word "erroneously" being inserted before the word "supposed," as, without doubt, the animal locust is meant; it being to this day a delicacy with native tribes where it is found.

Canna coccinea is stated, with a query, to be the source of *Tous-les-mois;* as it is a *fibrous* and not a *tuberous* rooted plant, this cannot be the case: it is most likely *C. edulis.*

Hebradendron cambogioides of Graham is given instead of *Garcinia morella* as the source of gamboge.

Under the "Gums and Gum-resins" there is no mention of myrrh, galbanum or ammoniacum. Olibanum, in spite of the researches of Carter, Birdwood and others, is still said to come from *Boswellia serrata.* Under "Medicinal Barks" the Countess of Chinchon is quoted as the "Countess of Cinchona," though if it were true, the case of *Cin* v. *Chin* would be unknown. The source of red bark is stated to be "not yet ascertained." A reference to any work on materia medica will, however, show that *C. succirubra*, Pavon, ms., is the plant yielding it. *Picræna excelsa* is not mentioned; *Quassia amara* escapes with the statement "is a valuable febrifuge;" but the seeds of *Simaba Cedron*, truly an interesting object, though seen only in our museums, has nearly twelve lines devoted to it. Again, *Chondrus crispus* is mentioned, but why is *Cetraria islandica* left out?

Gambier and Cutch are both put down to the account of *Acacia Catechu*, but Gambier is obtained from a rubiaceous plant, *Uncaria Gambir*. In several places only one plant is mentioned as producing a certain substance, whereas there are several. *Ilex Paraguayensis* is the only source of maté given; Mr. Miers has mentioned eight, Gutta percha is mentioned as from one plant *Isonandra gutta;* but the researches of De Vriese, Reinwardt, Motley and others, now that *least* a dozen afford it.

Some of the substances are badly arranged; mustard and the oil of illicium (though their Natural Orders are indicated) are grouped under "Umbelliferous Plants with Aromatic Fruits." Under essential oils, oil of illicium is not mentioned.

We have thus freely criticized this part, because there are many good points in the book, and there is no reason why a certain standard of excellence having been attained in a portion of it, the whole should not be all one could desire. It requires careful revisal, and the recent literature of the subject to be well attended to. A nice power of discrimination is required to judge between necessary and unnecessary matter, for however interesting a substance may be, if it does not actually occur in commerce, it should be unhesitatingly excluded. More attention should have been paid to state the commercial varieties, and short terse descriptions of each article given, so as to enable the student to compare it with the substance itself, and thus strengthen him in the habit of "describing methodically."

Our space will not allow us to go into detail with Part III. We must say, however, that it is capitally arranged, and contains a large amount of interesting information, given in a very readable style.

We cannot close our notice without directing attention to the very valuable Appendix. It consists of nearly 400 names of substances and their synonyms, in 24 languages. It will doubtless prove a great boon, and we should like to see it enlarged and published in a separate form.

The book deserves success. It is well got up, and the type and paper are good.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[5.]—LABELS FOR HERBARIA.—Should "*Botanist*" be obliged to have his own labels printed, the following form may be of use to him:—The plants to be mounted on cartridge paper, placing above them the suborder or genera, and below, the species, common name, locus and tempus (or place where and time when gathered), and divide into fasciculi (or bundles).—VINCIT AMOR PATRIÆ.

Labels for herbaria can be had from G. Witt, King's Lynn, at 5*s*. per 1000. I enclose one.—E. M.

Mr. H. Deane recommends Newman's Botanical Drying-paper as the best for herbaria purposes. It may be obtained at 9, Devonshire Street, Bishopsgate, price 15*s*. to 18*s*. per ream. He also says that a book of botanical labels was published by the Botanical Society of London, which might be obtained from Mr. Van Voorst, Paternoster Row; but he thinks it is better to have a blank form of label printed, as the duplicate labels in the book are limited.

[30.]—HAIR-OIL SCENT.—*H. P. Hearder* sends the following:—

Ol. Lavand. ℥xvj
Ol. Rosmar. ℥xvj
Ol. Cassai ℥ij
Ol. Caryoph. ℥iv.

It costs about 3*s*. per lb.

[37.]—EAU DE PORTUGAL.—*J. F.* (Aberdeen) in answer to a correspondent, sends the following recipe:—

℞. Ol. Limonis ʒvj
Ol. Verbenæ gtt. xv
Ol. Bergamot ʒj
Otto Rosæ gtt. xv
Sp. V. Rect. ℥xx. M.

[39.]—LIQUOR COCCI.—A reply has been received from *J. T. R.* similar to one given last week.

[48.]—CRYSTALLINE POMADE.—"*Utile*" (Boston) begs to inform *A. H. C.* that the following makes a good crystalline pomade:—

℞. Oil of Almonds ℥xxiv
Castor Oil ℥viij
Spermaceti ℥iv
Palm Oil ʒvj
Oil of Verbena,
,, Cassia,
Otto of Rose, each ♏xl
Essence of Bergamot ʒj
Mix.

[57.]—FLORIDA WATER.—*Geo. Vennall*, Chemist, Cranleigh, Surrey, can supply "*Nemo*" (Sudbury).

[59.]—DISPENSING.—Although four replies have been made to this query, all of them have failed to notice the only point worthy of attention, viz. that the quantity of salts ordered is not soluble in a mixture containing one-fourth of its volume of rectified spirit, the heat generated by mixing 1½ oz. of a rectified tincture with 4½ oz. of water being sufficient to keep the salts in solution for a time, but before two doses had been taken the remainder would have set into a magma of small crystals. I fail to get the copious black precipitate noticed by your querist, the slight deposit there is being due to resin, etc., from the ginger slightly darkened by the iron.—J. H. BALDOCK, *S. Norwood*.

The peculiar black precipitate which M. Masson did not discover (was his tinct. zingib. B.P.?), but which "*Magnesia*" and others found, is clearly accounted for by the action of the ferri sulph. on the resin, etc. of the tinct. zingiberis. The undissolved quinæ sulph. carries mechanically the result—a dark, resinous tannate (?) of iron—to the bottom of the liquid, leaving an almost discoloured solution of magnes. sulph. above. I cordially endorse your opinion as to the impropriety of introducing acid. sulph. dil. in such a case.—ALPHA.

[61.]—TASTELESS PILLS.—With regard to the inquiries of two of your correspondents, I have been accustomed to coat my pills with a mixture of pulv. gum tragacanth and p. sacch. alb. in equal proportions. After having well shaken them with a small quantity of white of egg, and dusted them liberally with the powder I have named, they attain a slowly soluble coating, pleasant to the taste, and of smooth surface. —J. T. R.

[63.]—GREEN FLUID FOR SHOW BOTTLES.—*J. Barker* (Sudbury) writes:—"In answer to *W. W.*, sulphate of copper and nitric acid, diluted with water, form a very pretty green. I have some now in my window, made in 1851, and it is perfectly bright and clear, and entirely free from any deposit whatever."

C. Fields (Stamford) and "*Pestle and Mortar*" (Dorking) recommend copper coins or wire treated with nitric acid.

Chloride of nickel, diluted to the desired tint, is the *best;* chloride of copper also gives a good colour.—J. H. BALDOCK, *S. Norwood.*

The following will give a good bright colour:—

Solution of Cupri Acet.
Diluted Acetic Acid.

Mix and add—

Solution bichrom. of potass. q. s. to get the colour required. —H. BLAND, *Scarborough.*

A very beautiful and permanent emerald green can be obtained by dissolving nickel in dilute sulphuric acid with heat.—PESTLE AND MORTAR.

℞. Cupri Sulph. partem unam
Sodii Chloridi partes duas.

Dissolve in water and dilute to desired shade.—H. STOREY.

The following does not contain more than 5 grains of solid matter to the gallon, and can be altered in shade to any degree by the addition of the bichromate:—

Liq. Fer. Perch. Fort. P.B. ♏v
Sol. Potass. Pruss. ♏v
Acid. Hydrochlor. Pur. ♏x
Sol. Potass. Bichromat. ♏v vel q. s.
Aquæ cong. ij.

The solutions should be saturated, and the acid the strong P.B.

[64.]—COLD CREAM.—

℞. Cer. Alb.,
Cetacei, ana ℥j ʒiij
Ol. Amygdal. ℥viij
Aquæ Rosæ ℥iv
Otto de Rose gtt. ij.

Dissolve the wax and spermaceti; add the oil; then *gradually* mix with the rose water, previously made warm.

[65.]—DIAMOND CEMENT.

℞. Ichthyoc. Opt. ʒvj
Gum Mastic ℥ij
,, Olibani ℥ij
Aquæ Puræ ℥ix
Sp. Vini Rect. ℥xij

Dissolve the isinglass in the water (in a water bath), then stir in the mastic previously dissolved in the sp. vini, and lastly stir in the olibanum in the state of an impalpable powder. —J. W. SELWOB.

Isinglass in strong acetic acid to the consistence of a paste gives a good, *clear* cement.—J. H. BALDOCK, *S. Norwood.*

[67.]—TINCT. PRUNI VIRGINIANÆ.—

℞. Wild Cherry Bark, bruised, 2 ounces.
Proof Spirit, 20 ounces.

Digest for fourteen days; express, and filter. Or the tincture may be better prepared by the process of displacement or percolation.—ALFRED UTLEY.

See paper by Professor Bentley on *Prunus (Cerasus) Virginianæ* in PHARM. JOURNAL, Vol. V. Second Series; form for tincture, page 105.

A similar answer has been received from *J. H. Baldock* (S. Norwood); and others from *C. Fields* (Stamford) and *S. M. S.* (Weymouth), giving seven days for digesting.

[68.]—POT POURRI.—"*Iodi*" (Sudbury) would be glad of a recipe for making "pot pourri."

[69.]—FRENCH ESSENCES.—"*Odor*" would feel extremely obliged to any brother chemist who would kindly supply him with some *practical* information relative to the strength and process of preparing essences from floral pomades as practised by manufacturing perfumers.

[70.]—DISPENSING.—Will any of your readers kindly give me their opinion as to the best method of dispensing the following liniment?—

℞. Ol. Camph. ℥ij
Ext. Belladonnæ ʒss.
M., ft. linimentum. J. S. A.

[71.]—CORN PLASTER.—"*Utile*" would feel greatly obliged by any of our correspondents giving him a good formula for a corn plaister that would do to spread on sheeting.

[72.]—COUGH BALSAM.—"*A Correspondent*" wishes for a recipe for a celebrated cough balsam.

[73.]—CHLORODYNE.—*M. P. S.* desires to be furnished with a recipe for chlorodyne soluble in water.

[74.]—TOILET VINEGAR.—"*Reciprocate*" would be obliged by any correspondent giving a formula for toilet vinegar.

[75.]—DECAYED TEETH.—*G. W. P.* (Manchester) would like to know what is the best and safest thing to use for destroying the nerve of a decayed tooth. Something in the form of a paste is preferred.

[76.]—GLYCERINE JELLY.—*T. M.* (Worksop) would like a recipe for making transparent glycerine jelly either with tragacanth or isinglass.

[77.]—DISPENSING.—Can any of your readers inform me how I can dispense the following mixture so as the result shall be, without filtering, perfectly clear? It has been dispensed in London, and every time a clear mixture was sent out. I have dispensed it some twenty or thirty times, and it has always been milky?

℞. Acid. Phosph. Dil. B.P. ʒiij
Ferri Cit. c. Quin. ʒj
Tinct. Nucis Vomicæ ʒj
Sp. Chloroformi ʒij
Aq. Destill. ad ℥vj.

Ft. mist. One tablespoonful to be taken in half a wineglass of water, at eleven and five.—"EXHIBATUR."

[78.]—PASTE FOR CLEANING METALS.—"*Polio*" will be glad if any correspondent will inform him of a good recipe for making a paste to clean and polish brass, tin, etc.

[79.]—PASTIL PAPER.—Can any of your readers give me a form for making a good aromatic pastil paper?—G. H. B.

[80.]—DISPENSING.—Will some of your readers kindly tell me the best method to pursue in dispensing the following prescription?

℞. Syr. Tolutan. ʒvj
Bals. Peruv. ʒvj
Tinct. Nucis Vom. ʒij
Aquæ Camph. ad ℥vj.
M. S.—A dessertspoonful frequently. "CORTEX."

[81.]—SYRUP OF TAMARINDS.—"*Medicus*" wishes for a recipe for a syrup of tamarinds, as a basis for cough mixtures.

[82.]—COLOURS FOR CARBOYS.—*M.* is desirous to know the best way of preparing green, crimson and blue colours for carboys.

[83.]—ORANGE BITTERS.—*M. P. S.* and "*Iota*" wish for a recipe for orange bitters.

[84.]—PEPPERMINT CORDIAL.—*M. P. S.* wishes for a recipe for making peppermint cordial.

[85.]—GINGER BRANDY.—*M. P. S.* wishes for a recipe for making ginger brandy.

[86.]—PICK-ME-UP.—"*Iota*" asks for a recipe for making "Pick-me-up."

[87.]—GUM COWRIE.—*X. Q. Z.* wishes to be informed what is gum cowrie.

Correspondence.

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

"THE STORING OF POISONS."

Sir,—Your report of Mr. Smith's paper "On the Storing of Poisons," read by him at the Liverpool Conference has much interested me, and I regret that press of business prevented its being discussed.

When our Council introduced their code of restrictions, it was generally supposed to be a spontaneous act on their part; and, with others, I signed a protest against *any compulsory* regulations; but having since learned that they only yielded to Governmental pressure, I now feel that it is no longer a question whether we shall have any or no legal restrictions laid upon us, but *what they shall be*, and therefore it becomes each and all of us to assist our Council to conclusions that will satisfy the Government and the public without unduly fettering ourselves.

For this reason, I venture to express my unqualified approval of Mr. Smith's suggestions. They commend themselves to my judgment as simple, efficient and practical; and in support of these views I would say that I have kept and sold oxalic acid wrapped in purple paper for some years past, and believe it has been a useful safeguard. Also, that I have kept dangerous poisons for dispensing purposes in purple glass bottles; and I believe that, if the plan were fully carried out, it would be as effectual a preventive of accidents as could be adopted, without hindering business or inducing a dangerous trust in mechanical contrivances. It is not needful for those who have poison cupboards to do away with them; but the well-known fact that many rarely-used but innocent preparations are often kept in such cupboards, makes the necessity for some distinction in the bottles self-evident.

I sympathize with Mr. Smith's objection to alternative regulations. Unless the system adopted is one, and so simple that it could be made universal without difficulty, it would be worse than valueless.

The chief difficulty, to my mind, is the fact that, in the present Schedule, comparatively innocent preparations are classed with the most virulent as "poisons." Such an arrangement would mar the usefulness of any plan, if applied to all. We cannot associate an idea of danger with such articles as syrup of poppies or paregoric.

I also object to the indefinite wording of the present schedule, such as "Opium, and all preparations of opium, or of poppies." Every legal "poison" should be distinctly named, and only such preparations be included in the schedule as may, from their intensity or peculiarity, be considered truly *dangerous*.

It appears to me, therefore, that the first thing to be done is to get the schedule revised. When this is accomplished, there will not be much difficulty in applying the principles advocated by Mr. Smith to the "Storing of Poisons."

JOHN C. POOLEY.

Sir,—I beg to submit the following plan to your notice for the storing of poisons. As its adoption would ensure a ready system whereby order could be maintained in the position of the bottles, I sincerely hope that some of your correspondents may be pleased with the idea.

Let the shelves be covered with thin strata of wood, or other rigid material, in which holes have been cut corresponding with the size and number of the bottles; a convenient space should be left between the shelves and covering,—each bottle being thus fitted closely in separate divisions, and, presuming that they are of ordinary variety, it would be extremely difficult, without gross carelessness, to misplace them.

The closet might also be fitted with grooves in which the shelves could slide, by which the additional advantage would be obtained of permitting a closer inspection when required.

I may add that, during a ten years' experience in some of our leading dispensing establishments, I have not seen or heard of any arrangement so simple, or more practical, than the one just described. J. T. R.

FOX'S "PALATABLE" COD-LIVER OIL AND CASTOR OIL.

Sir,—Our attention has been directed to the report in your Journal of the transactions of the Liverpool Chemists' Association, November 10th, at which meeting the President directed attention to "palatable" cod-liver oil, stating that "he observed that a circular accompanied each bottle, with testimonials from medical men, and some who held the title of F.C.S., and he could not understand how such men could lend their names to a practice by which the public were led to believe that they were purchasing genuine cod-liver oil, whereas what they received was only about half oil."

The President appears to wish the Association to infer that we are deceiving the public by thus introducing the "palatable oils." Now, our object has been the very reverse of this. We have distinctly and repeatedly stated that they are a preparation, and contain a proportion of oil; and if the public will but take the trouble to look, they can see this for themselves. Had we not thus have placed the "palatable" oils before the public, but led them to believe, as stated, that they were oils only, the sale would not have reached the extent it has. Again, our preparations are specially intended for those who cannot take the simple oil, and who therefore would not have the remotest wish to purchase what would disagree with them.

It has been our great aim to put fully before the medical faculty, both by circular and weekly advertisements in the medical papers (to which we would direct attention) the fact of the oil being a combination. If we have, as stated by the President, led the public to believe they were purchasing cod-liver oil only, we have defeated our own purpose, and conveyed an impression the very opposite to our intention, inasmuch as we have most distinctly wished it to be understood that the preparations *are not* all cod-liver oil.

We fully invite the opinions of the medical profession as to the therapeutical value of these preparations in contrast to the ordinary simple oils.

Enclosed, we hand you opinions of some of the physicians of the leading hospitals and others, which will show the value of our preparations in cases where the ordinary simple oils have failed to accomplish the purposes intended, and wherein it is clearly stated "that it (cod-liver oil) is quite as efficacious as the ordinary oil, and much more readily digested by the weak stomachs of phthisical patients."

Manchester, Feb. 6th, 1870. GEORGE W. FOX & Co.

Sir,—Having seen certain strictures in your last issue, in a spirit of fairness I contradict the statement that the palatable oils have been brought before the public with a view to deceive them. I, together with my medical brethren, have received a circular on two occasions stating distinctly that the preparations of Messrs. Fox and Co. only contain 50 per cent of oil; and Mr. Abraham, the President of the Liverpool Chemists' Association, needs not to be informed that very few persons take cod-liver oil for the love of that nauseous medicine, but at the recommendation of the profession.

Messrs. Fox and Co. have not only sent circulars, but advertise weekly in the medical papers the proportion of oil in their preparations.

I, for one, have long felt the want of a more agreeable form of administering cod-liver and castor oils, and have recommended the preparations alluded to with marked satisfaction and benefit.

Mr. Abraham, perhaps, considers the chemists and druggists immaculate; but I have a preparation called "cod-liver cream," prepared by a chemist, which is stated on the label to contain 90 per cent. of oil, and, on analysis, contains about 25 per cent.

Now Messrs. Fox and Co.'s preparations contain more oil, according to Mr. A.'s statement, than they advertise.

I think it premature for the Liverpool Chemists' Association to have acted as they have, but I am afraid there is a vein of selfish interest at the foundation of their criticisms.

Oldham, November 30th, 1870. A PHYSICIAN.

Sir,—I noticed in your number of Saturday last the report of a meeting of the "Liverpool Chemists' Association," where it states, "The President exhibited a bottle labelled 'Palatable Cod-liver Oil,'" etc.

As Messrs. Fox and Co., of Manchester, have secured the right to use the term "palatable" cod-liver oil, I presume the remarks referred to their preparations: and as one of their earliest agents, and one who has pushed the sale of their oils, I feel that the remarks made by Mr. Abraham apply to me, and indeed to every chemist who has sold the preparations referred to, quite as much as to Messrs. Fox and Co.

I should be sorry to think I had assisted in deceiving the public to the extent I must have done if Mr. Abraham's idea be a correct one. I am of opinion, however, that he is wrong, and that the Liverpool Chemists' Association has acted very unfairly, by pronouncing judgment upon a matter it is evidently in ignorance about.

Messrs. Fox and Co. have depended almost entirely upon the support of the medical profession, and on the first introduction of their oils sent circulars to all members in towns where the oils were introduced, stating that they contained 50 per cent. (even less than Mr. Abraham gives as the proportion), and also sent a sample.

True, that the labels do completely cover the bottles,—for advertisement,—and that "prominent instructions are given to shake the bottle;" the very fact of that instruction being given would tell the most dull mind that it was a compound, and required well mixing before being taken.

There has been no attempt to keep the proportion of oil a secret, and now it has been made known to *every* member of the medical profession in the United Kingdom. It has not been stated on the bottles certainly, and I don't see the necessity for doing so in a preparation mostly recommended by professional men, who are quite aware of its composition.

I consider the oils to have been brought out in a perfectly honest manner; and, if medical gentlemen have found them to be all that they are represented, and to supply a great want, I think they are perfectly justified in giving their testimony, if they think fit, and feel sure most of your readers will agree with me that the Liverpool Chemists' Association has overstepped its bounds by presuming to complain of medical gentlemen having done something the particulars of which the Association had evidently not taken the trouble to inquire.

A spirit of fair play is my reason for writing these lines, and asking the favour of your inserting them in your next issue. JAS. WINTERBOTTOM.

Oldham, Nov. 30.

DRUGGISTS' CHARGES.

Sir,—Yesterday, a person brought me the following to dispense:—

℞. Ext. Col. Co. ʒj
Pil. Rhei Co. ʒss
Pulv. Ipecac. gr. xv
Ol. Carui gtt. x
Sapon. Cast. gr. xx.

Mix, and divide into 36 pills. Two to be taken every other night, or as occasion may require.

I charged 1*s*. 3*d*. for this, and was in return insulted by him, and told that he would never come into my shop again. On inquiring his reasons, I was told that my charge was outrageous, and that he had had the same prescription frequently dispensed at a first-class establishment in Wolverhampton for 8*d*. Is not this rather too bad, that a chemist should by thus "cutting" not only injure himself (which would not much matter), but should also injure respectable chemists, who use genuine drugs and try to make a living out of their trade, which at the Wolverhampton dispensing prices would be rather difficult?

I hope some day to see a list of prices for dispensing issued by the Society, from which no one can depart, not even the proprietor of the first-class establishment at Wolverhampton.

J. F. POLLARD.

Wavertree, near Liverpool, December 2nd, 1870.

Sir,—Your correspondent Charles Kidd, M.D., in last week's issue of the Journal, having indicated the neighbourhood in which I live as the place where cheap and nasty physic can be procured at the rate of 6*d*. or 7*d*. for 8 oz., with a bottle, etc., and as he must allude to one of two or three of us, I notice some of his remarks without apology. In reply to the worthy doctor's strictures, then, I have to say that I charge as much as he seems to think a fair price; and that in the case of physicians' prescriptions dispensed, it is the rule, and always has been with me, to send neither quack wrapper nor medicine list.

If the doctor will give me the favour of a visit, I shall be happy to show him my list of charges, which has been in use for the last ten years.

I use the infusions made fresh, and never send out stale,—

the best scammony, etc. etc.; and profess to charge a respectable price. I think therefore my brethren will see I do not come under the doctor's designation in keeping the "cheap and nasty" shop off Oxford Street, near Grosvenor Square.

THO. RAMSDEN.

29, *North Audley Street, Grosvenor Square, W., December 6th.*

NEW MATERIAL FOR SUPPOSITORIES AND PESSARIES.

Sir,—In your last number you give a formula for suppositories from the *Canadian Pharmaceutical Journal*, containing glue and golden syrup. These new materials may, I think, be advantageously represented in British pharmacies by pure gelatine and glycerine. Some time since I was handed the following prescription:—

℞. Pessar. Atropinæ gr. $\frac{1}{18}$ in sing.
c. Gelatin. mitte viij.

One to be used every night. W. O. P.

This is an "obscure" prescription. It might have been intended for an "especial" druggist, but as W. O. P. was not "formerly surgeon, royal navy," and the "Latinity" was easily to be comprehended, I ventured to dispense it. I took of Nelson's gelatine 1 drachm; glycerine, 1 drachm; water, 1 oz.; dissolved by heat; added the atropine, and poured into moulds. The evaporation will leave each pessary weighing about 1 drachm, an elegant and faithful representative of the prescriber's idea, stiff enough to be handled, and readily melting at a slight increase of temperature.

The moulds I use have some points of superiority, especially when gelatine forms the body of the pessary. They are made in this wise: cut and file a cork to the required size of the cone; round this, twist a piece of waxed paper; cut off the unequal edges, and stand the cup thus formed with its twisted point downwards in a slightly-compressed heap of linseed meal or chalk When filling these moulds, which cost little and are worth much, you can see what you are about, can use all your material, can make the pessaries all of one size, they come out clean, and, when cocoa butter is used, can be dropped into water to hasten the cooling.

WM. MATTHEWS.

Wigmore Street, December 6th, 1870.

P.S.—I hope you won't send the original of the *facsimile* prescription to Mr. Ince, to be a puzzle to future candidates. If you do, ask him to put it in, as Mr. Watson Bradshaw would say, *par parenthèse* (*vide* page 458, in a lucid paragraph, twenty-one lines long with only one full-stop), to show what a prescription ought *not* to be.

PHYSICIANS' PRESCRIPTIONS.

Sir,—Having observed more than one of your correspondents' remarks on physicians' prescriptions, I forward the appended, hoping you may find it convenient to give it a place in your next. I dispensed it some years ago, and had I not actually seen the "author" of it, I would not have taken it in hand, it seems so very "*general*." I still possess the "original."

℞. Podophyllin. gr. $\frac{1}{8}$
Ext. Coloc. Co. gr. ij
Ext. Taraxac. gr. j
Ext. Anthem. gr. j
Ext. Hyoscy. gr. j
M. fiat pil. tal. xviij. Capiat j omni nocte.

℞. Ext. Elaterii gr. $\frac{1}{4}$
Strychnin. gr. $\frac{1}{8}$
Iodid. Potass. ʒj
Ferri Tart. ʒij
Sol. Mur. Morph. ʒij
Acet. Potass. ʒiv
Tinct. Calumbæ ʒvj
Vin. Ipecac. ʒiij
Glycerinæ ʒiv
Inf. Calumbæ ad ℥vj.
M. fiat mist., cujus capiat coch. magn. j bis vel ter in die.

℞. Hydrarg. Biniodid. ʒss
Ung. Cetacei ad ℥ij.
M. fiat ung. utend. ut dictum nocte et mane.

A burgh town on the west coast of Scotland can *even now* boast of the services of the practitioner who *wrote* this (I can't say *prescribed* it).

ALEX. FRASER, *Chemist and Druggist.*

Largs, N.B. Dec. 3rd, 1870.

WHOLESALE DRUGGISTS' ASSISTANTS' SOCIETY.

Sir,—Having seen in page 388 of your Journal a request made by J. Hart for some information regarding a Wholesale Druggists' Assistants' Society supposed to be at present in course of formation, I have carefully watched for a reply from some of your readers. I should be most happy to join in such a Society did one exist, but I fear from the fact of no one tendering the required information that your correspondent, J. Hart, must have been misinformed, or that the movement, like one made some years since for a similar purpose by Mr. O. D. Owen, has fallen to the ground for want of sufficient energy on the part of its promoters. If such a Society is actually being formed, why is so little known regarding it?

Bishopsgate Street, City, P. S. COSGROVE.
26th November, 1870.

A POINT OF ETHICS.

Sir,—In reference to the prescription dispensed by "Magnesia," you remark that a chemist would not be justified in adding "ac. sulph. dil." to dissolve the quinine, so as to make "a mixture." Now, I beg respectfully to differ from you on this point. I think any qualified chemist has a perfect right to use his discretion in properly compounding any medical man's prescription; and, in the case in point, the doctor had evidently forgotten to write "ac. sulph. dil.," or he did not understand chemistry. I have frequently compounded a similar prescription from doctors in this town, and they always invariably write "ac. sulph. dil." Medical men require looking after as well as "chemists."

CHEMICUS OF TWENTY YEARS' STANDING.

A WARNING.

Sir,—I have been taken in! I write in order to warn my brethren in London and suburbs against the same paltry imposition. A man came into my shop, and, presenting a bill of "De Conder's Pills," inquired if I kept them in stock, and being told that I did not, but could procure them, requested me to do so, and stated that he would call for them the next evening. I obtained the pills, but need hardly add that the man has not made his appearance again. I should not have troubled you in this small matter, but I found that three druggists in this neighbourhood had received similar visits from the same man, and I have no doubt many others as well. Publishing this may deter the gentleman from imposing on others in the same way, and may lead them to request him to pay before they obtain them. I would advise that he should be charged at least 1*s.* 2*d.*, as they cost that.

Bow, E., December 7th, 1870. S. D.

The Phaeton Pen.—We have received from Messrs. Macniven and Cameron a box of the above pens.

H. Rayner and *W. Wright* (Boston).—The letters and stamps have been handed to the Secretary.

"*A Student*" and *W. H.* (Canterbury) are referred to the rule requiring the name and address of correspondents.

Colchicum.—They may be obtained in London of Jackson and Townson, Griffin, or Howe; at Norwich, of Sutton; at Newcastle, of Brady, or Mawson and Swan; at Manchester, of Mottershead.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. F. Adams (Stoke-on-Trent), Mr. W. M. Macnaughten (Dublin), Mr. M. C. Cooke, Mr. T. W. Langridge (Midhurst), Mr. H. P. Hearder (Plymouth), Mr. S. Newbury (Dorking), Mr. A. F. Girdler (Shirley), Mr. Twemlow (Edgware Road), Mr. J. Stathers, Mr. W. T. Oldham (Wisbech), Mr. J. E. Howard, Mr. E. C. C. Stanford (Glasgow), Mr. W. Rew (Exeter), Mr. W. W. Stoddart, Mr. J. Beedzler, F. R. B. (Middlesburgh) F. J. B., G. H. B., "Soda-Water," T. T. (Islington), Mr. Hustwick (Liverpool).

The following journals have been received:—The 'British Medical Journal,' Dec. 3; the 'Medical Times and Gazette,' Dec. 3; the 'Lancet,' Dec. 3; the 'Medical Press and Circular,' Dec. 7; 'Nature,' Dec. 1; the 'Chemical News,' Dec. 2; 'Journal of the Society of Arts,' Dec. 1; 'Gardeners' Chronicle,' Dec. 3; the 'Grocer,' Dec. 3; the 'English Mechanic,' Dec. 2; the 'Produce Markets Review,' Dec. 3; the 'Canadian Journal of Pharmacy' for November; the 'Journal of Materia Medica' for November; Hardwicke's 'Science Gossip' for December; the 'Food Journal' for December; 'Transactions of the Odontological Society' for November; the 'Educational Times' for December.

INFUSIONS.

BY ALFRED ALLCHIN.

(*Concluded from page* 422.)

In my last paper, when stating that Mr. Deane had calculated the cost to make "fresh" infusions to be about £8, I omitted to state that that sum represented the annual cost.

In April, 1856, at a meeting in Edinburgh, Mr. Stephenson, at the request of his partner, Mr. Robertson, read a paper in which he strongly advocated the Alsop method of preserving. A sample of infusion of senna was placed on the table, which had been bottled 2½ years. When opened, it was found to possess the aroma and other properties of the freshly prepared infusion. Infusions of "Orange," "Chiretta," "Senega," and "Calumba," which had been bottled many months, were found to be equally good.

Mr. Stephenson stated that it was the practice in their establishment to prepare enough of each infusion to last two or three months, but some practical difficulties had been met with in the mode previously suggested. He expressed his opinion that the bottles used should be filled to overflowing with hot infusion, and then tied over with moistened bladder gut skin.*

On June 1st, 1859, twelve days before his death, Mr. Jacob Bell again introduced the subject, and doubtless he must have felt very keenly the desirability of coming to some common understanding on this matter. It was in all probability almost the last effort of his life, in connection with our Society. His mind was evidently free from prejudice, for both sides of the question were fairly stated.

He commenced by descanting upon the damaging effect likely to be produced on the minds of patients when they saw their mixtures compounded with fresh infusion at one establishment, and a few drams of a concentrated preparation made up with water at another; besides the probability of their finding a difference in taste, appearance, and medical properties.

The inconvenience of waiting an hour, or even several hours, while the fresh infusions were being made, was next alluded to. The comparative merits of concentrated and fresh preparations were also discussed, and the difficulty of surmounting the question at issue as long as there was no sanctioned authority either for the use or preparation of concentrated infusions pointed out. The same mistrust and doubt formerly existed respecting the decoctions of sarsaparilla, till the attention of the College of Physicians was directed to the subject, who then introduced a concentrated preparation under the name of fluid extract. Mr. Bell then dwelt upon the propriety of admitting into our Pharmacopœia formulæ for Liq. Cinchon. Taraxac. and similar liquors, and concluded by expressing a hope that the question would be settled, and the inconvenience and perplexity which had existed for so many years might be put an end to.

Mr. Haselden followed Mr. Bell, and first alluded to the high estimation in which the fresh infusions were held by medical men and others. He expressed an opinion that it was highly desirable that prescriptions should be dispensed with integrity, observing that the deposit continually occurring in all concentrated preparations, created a suspicion that when diluted they did not always represent those freshly prepared. He protested strongly against the concentrated system being promulgated by pharmacists, predicting that if we were constantly inundating medical men and others with these preparations, we should eventually have all medicines prescribed in a concentrated form, and a teaspoonful dose administered instead of two tablespoonfuls. This anticipation is rapidly being realized, for we not unfrequently hear complaints made by the pharmacist, who feels that he has been deprived of his legitimate profits by this mode of prescribing. Mr. Haselden concluded by stating that infusions would keep perfectly good, if from two scruples to a dram of tincture were added to each ounce of the freshly prepared liquid. He was quite aware that the propriety of introducing spirit in any form was questionable, but still as infusions were generally ordered in combination with tinctures, he thought the matter worth consideration.

Mr. Waugh said there was no excuse for using concentrated preparations, for he had for many years adopted the plan of bottling, as recommended by Alsop, and found it to answer perfectly.

Mr. T. H. Hills said it had occurred to him that a probable way of overcoming the difficulty would be, if possible, to shorten the time for making these preparations. With the view of arriving at some satisfactory conclusions he had tried some experiments with a French *cafetière* of simple construction, and the result proved most satisfactory. He thought that if further experiments were made in this direction it would probably be found that all infusions might be made by a uniform process that would not occupy more than ten minutes. The attention of the reader is particularly called to these last observations, for they were made by one whose experience is, perhaps, not surpassed by any other pharmacist, and whose soundness of judgment has never been questioned. I have no hesitation in saying, that had they been supported by evidence such as that now furnished by Mr. Barnes, they would have received at the time the consideration they merited, and, in all probability, some speedier steps would have been made towards the settlement of the question.

At the October Evening Meeting the opinion of Mr. Hills was supported by Mr. Geldard, of Plymouth, who said, that if full advantage were taken of the process of displacement, the period of maceration might be reduced to a mere fraction. In practice he had proved it to be so, when made according to a plan, which he described.* The dispenser, if he adopted this mode, would be able to say when a prescription containing an infusion was brought to him, that it would be ready in twenty minutes, and have the satisfaction of knowing that he was giving the patient an aromatic medicine instead of a vapid, mawkish liquid, made from a bottle which may have been on the shelf, depositing its activity, for months.

In 1866, Mr. Haselden† advocated the principle adopted in the preparation of the now called Mist. Gent. Co. He had applied the same process to cascarilla, calumba and orange, and obtained equally good results. He thought an extension of the process would meet the difficulties with regard to fresh infusions, because, when thus made, they would keep

* Pharm. Journ. Vol. XVIII. p. 564.

* See Pharm. Journ. 2nd Series, Vol. I., p. 263.

† Pharm. Journ. 2nd Series, Vol. VII., p. 572.

perfectly good any length of time, and it would always be known that a sound preparation was being dispensed.

No general remarks of any importance were made after this until Mr. Barnes again introduced the subject at the November Evening Meeting of this year.* His paper is valuable, inasmuch as he gives, I think, very good reasons for assuming that the time now occupied in making infusions might very safely be lessened. Like all honest men having the direction of a dispensing establishment, he is most anxious that all medicines compounded under his care should possess their proper medicinal value. He, however, doubtless sometimes finds much inconvenience arising from the length of time now occupied in preparing fresh infusions, and suggests the propriety of shortening the time for standing. His reasons are at once apparent, for he finds most of them when so made contain the same amount of extractive matter, and appear, in every respect, equal to those made according to the instructions of the Pharmacopœia. In many cases the time was reduced to one-half, and in some to a quarter of that officially ordered. The results, I am aware, are not sufficiently conclusive to satisfy all minds upon the subject, but has not sufficient been done to stimulate further inquiry? It is a matter in which we can all lend a helping hand, and I trust, as opportunities occur, we shall do so. Let all roots, barks and leaves be reduced to a state of comminution that will allow them to pass through a sieve having eight meshes to the linear inch; be careful always to have the infusion-jug hot, and make the infusions in quantities of not less than a pint; then examine the results, and it would not surprise me if it should be found that the time for standing can, in some cases, be reduced to a few minutes, and that not more than one or two need exceed half an hour.

Dr. Redwood naturally defends the Pharmacopœia instructions; but the fact chosen as an illustration of their soundness appears to me an unfortunate one, and might fairly be claimed by Mr. Barnes in support of his views. Surely if men of such vast experience as tea-tasters find that all the essential elements can be obtained from tea by a seven minutes' maceration, it is time for us to consider the propriety of altering our notions respecting our medicinal infusions.

* PHARM. JOURNAL, 3rd Series, Vol. I. p. 368.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

'Twas on one of those glorious days of the month of August, when sunshine and fine weather were doing their utmost to tempt the sedentary, that the author succumbed to their influence, and wished for a dose of fresh air, with the exhilarating pleasure of a long walk in the beautiful environs of the good old city of Bristol. People were from home, some enjoying the sea-breezes of Weston or Clevedon, others the rocky cliffs of Ilfracombe or Tenby. Physic and its accessories were at a discount, and little remained to strengthen the resolve, and carry out the wish, for a day's holiday and relief from the cærulean thoughts that are said sometimes to haunt the too zealous attendant at the shrine of business.

But where should he go? Should it be the constitutional mile or two, that horridly mechanical remedy for *ennui* and excuse for exercise? That thought was no sooner born than killed. What then was to be done? The idea was suggested that a most interesting line of study might be afforded by an examination of the locality for what portion of the materia medica could be found in a natural state. So interesting and profitable did this investigation become, that the author was induced to narrate what he observed and collected, so that others might experience the same pleasure in various parts of our highly favoured country.

Bristol, be it remembered, is a veritable epitome of all that is good in opportunities for the study of natural history, geology, mineralogy, or archæology. Few, if any, spots in the world can be found to excel it. Fine downs, magnificent cliffs, contrasting with low marsh-lands; fine woods, abounding in ferns and masses, lichens and algæ; ditches of fresh or brackish water teeming with *Diatomaceæ*, *Desmideæ* and other endless work for the microscopist,—all these offer their treasures with liberal hand.

The mineralogist would be enchanted with choice specimens of rocks and ores, some of great rarity. The brilliant pyrites or galena, the sober calamine, the chaste alabaster, the sparkling Göthite and the delicate celestine, all combine to form a striking collection for the cabinet.

In short it is the neighbourhood in which such names as Bentley, Berkeley, Phillips, Buckman, Broome, Stephens and Thwaites have revelled and laboriously acted out the idea of an old poet, though in a better sense:—

> "Nec tantum segetes alimentaque debita dives
> Pascebantur humus: sic itum est in viscera terræ:
> Quasque recondiderat, Stygiisque admoverat umbris,
> Effodiuntur opes."

For the antiquarian, also, there cannot be a more interesting spot. Here may be seen the enormously thick walls of an ancient fortified city with the gateway still extant, although built in the reign of William Rufus. Camps of the old Romans and extensive monasteries are everywhere indicated. Even the remains of old Bristol castle are still visible, recalling to the memory the actual building in which Stephen was kept a prisoner, and Henry II. received part of his education.

The richness of the locality in plants and minerals is due to the variety of the geological formations, seven of which can be examined and easily studied within the radius of a very few miles.

It is well known that plants occur relatively to the strata on which they grow. Thus *Arabis stricta*, *Hutchinsia petræa* and others of the *Cruciferæ* and *Crassulaceæ* choose the carboniferous limestone; *Epilobium lanceolatum*, *Campanula latifolia* and *C. patula* prefer the Pennant; *Digitalis purpurea* and *Helleborus fœtidus* select the sandstone; the marsh-land favours the *Caltha palustris*, *Thalictrum minus* and *Nasturtium palustre*.

Some of the land is actually below the mean sea level, while the high table-lands and hills rise to an altitude of 700 feet. With such extreme contrasts in physical configuration, there is a corresponding variety of scenery.

Westward the delighted observer meets with the magnificent gorge of Clifton, rich in geological treasures, or the Nightingale valley with its sylvan recesses. To the east the Cotteswold Hills, with the coast-line of an ancient sea plainly defined, speak most forcibly of prehistoric times. On the south the top of Dundry Hill unfolds an extensive view of the Bristol Channel, backed by the mountainous scenery of Monmouthshire and the Principality.

All around spring—

> "The living herbs, profusely wild
> O'er all the deep green earth, beyond the power
> Of botanist to number up their tribes."

Such is a very brief and inadequate introduction to a neighbourhood teeming with interest and beauty, which few other places in our native country can equal, and to which the author can honestly recommend a lengthened visit.

In lieu of this the following description of the pharmacological treasures found in this locality may prove to some of our pharmaceutical brethren a source of pleasure, if not of instruction.

(*To be continued.*)

THE CHOLERA FUNGUS.

BY M. C. COOKE, M.A.

The revival of this subject, after some months of silence, is to be attributed to the publication, in Calcutta, of the first report on the microscopic objects found in cholera evacuations by Mr. Timothy Richards Lewis, M.B. It will be remembered by our readers that certain theories have been promulgated regarding the cause of cholera, and mainly that of its fungoid origin, as advocated by Professor Hallier, of Jena. In order to test the value of this theory, it was resolved that certain Government officers should make the necessary observations and experiments in India, and report results. The first instalment of such report is now before us.

It is hardly necessary to epitomize Dr. Hallier's theory except to state that, from his examination of cholera evacuations, he came to the conclusion that cholera was produced by a species of fungus belonging to the group of smuts called *Ustilagines*, to which the common smut of corn and grass, and the more imposing smut of maize, belongs. At first, Dr. Hallier referred this fungus to the genus *Urocystis*, and considered it to be closely allied to that species which attacks the rye in Europe, and which he believed was parasitic on rice in India. As soon as the Professor's treatise arrived in this country we made bold to challenge his facts, either that *Urocystis* spores would cause any choleraic disturbance in the human subject, or that any species of *Urocystis* had ever been found as a parasite on the rice-plant in India. Subsequently the Jena Professor shifted his ground, and, though still adhering to his fungus theory, renounced *Urocystis*, and maintained the "cysts" as fungus spores. The basis for the theory, at least so far as we comprehend it, is, that bodies can be found in the growing tissue of rice-plants which the author regards as identical with the cysts found in cholera evacuations; hence that cholera is generated by the consumption of rice in a diseased or smutted condition.

Common sense naturally inquires, Are the "cholera cysts" the cause of cholera? are they found under any other circumstances? what are they? are they found in choleraic discharges in India? are they found in the growing rice-plant? and what connection is there between rice-eating and cholera? To answer some of these queries Mr. Lewis has applied himself with great zeal, ability, and, in our opinion, success.

It is impossible, even were it necessary, to follow the experiments in detail, and to give all the reasons on which the conclusions are based. It will be enough to indicate what are the fair deductions to be made from the experiments already made. The caution contained in the following paragraph cannot be too strongly insisted on, and will serve as introduction to the "results:"—"In spite of more than ordinary care, very different forms of life will make their appearance in substances which are derived from the same source under conditions which *seem* to be identical, and that too in very simple mixtures. Consequently, the greatest caution must be exercised in estimating the importance, or otherwise, of any peculiar manifestations of vitality which may be observed in substances associated with disease." Had this caution been kept in view by some of those who have experimented on the cultivation of mucedinous fungi, for instance, it is probable that we should have been spared some few assumptions which have obtained currency as facts.

The "results," as indicated in this first report, are, "That no 'cysts' exist in choleraic discharges which are not found under other conditions." That is to say, the cholera cysts figured by Professor Hallier are not always obtainable from cholera discharges, are not confined to cholera, nor even to diseased conditions of the intestines, but may be cultivated from the stool of perfectly healthy persons.

"That cysts or sporangia of fungi are but very rarely found under any circumstances in alvine discharges."

"That no special fungus has been developed in cholera stools, the fungus described by Hallier being certainly not confined to such stools."

The experiments instituted to test the observation as to the inoculability of rice-plants have as yet not been satisfactory, consequently no conclusions have been arrived at on the matter.

"That the still and active conditions of the observed animalcula are not peculiar to this disease, but may be developed in nitrogenous material even outside the body."

"That the flakes and corpuscles in rice-water stools do not consist of epithelium nor of its *débris*, but that their formation appears to depend upon the effusion of blood plasma, and that the 'peculiar bodies' of Parkes, found therewith, correspond very closely in their microscopic and chemical characters, as well as in their manifestations of vitality, to the corpuscles which are known to form in such fluid. These are generally, to a greater or less degree, associated with blood-cells, even when the presence of such is not suspected, especially as the disease tends towards a fatal termination, when the latter have been frequently seen to replace the former altogether."

"That no sufficient evidence exists for considering that vibriones, and such-like organisms, prevail to a greater extent in the discharges from persons affected with cholera than in the discharges of other persons, diseased or healthy; but that the vibriones, bacteria and monads (micrococcus) may not be peculiar in their nature, for these *do* vary, may not be the product of a peculiar combination of circumstances, and able to give origin to peculiar phenomena in a predisposed person—is 'not proven.'"

Hence it seems pretty clear that the fundamental facts (?) of the Hallier theory are considerably shaken by this report, and we shall wait patiently in the full anticipation that future observations will confirm and strengthen the results obtained by Mr. Lewis, and destroy the whole theory of the fungoid origin of cholera. It is scarcely possible that such a series of observations could have been carefully and zealously performed without affording interesting facts in the conduct and development of "low life." Many such will be found recorded in these pages, and of these we may mention the observations on *Penicillium*, illustrated by Plate XXI. A preparation set aside for cultivation exhibited "on the fourth day tufts of *Penicillium* of two varieties, *P. glaucum* and *P. viride*. This continued until the ninth day, when a few of the filaments springing up in the midst of the *Penicillium* were tipped with a dewdrop-like dilatation excessively delicate,—a mere distended pellicle. In some cases they seemed to be derived from the same filament as others bearing the ordinary branching spores of *Penicillium*, but of this I could not be positive. This kind of fructification increased rapidly, and on the fourteenth day spores had undoubtedly developed within the pellicle." This example of the production of a species of *Mucor* from *Penicillium* corroborates a similar observation of our own, in the development of a new and delicate species of *Mucor* from *Penicillium roseum*, as detailed elsewhere. The microscopical student will find in the excellent figures with which this report is copiously illustrated, and in the details of observations, much that is exceedingly valuable. It is a misfortune and a mistake not to publish it in London as well as in Calcutta.

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Continued from page 446.*)

"Carbonate of Ammonia" of Commerce.

It will be more convenient to defer for the present the consideration of the manufacture of the commercial carbonate.

Form.—All I wish to point out under this heading is that the variations in the appearance of the substance, whether between one sample and another, or between different layers of the same sample, are not proofs of any material difference in composition. It may be very compact with a more or less conchoidal fracture, or in softer cakes of prisms arranged uniformly perpendicular to the surface of deposition, or in white nearly opaque layers, and yet differ no more in composition than two samples of similar appearance. On the other hand, similarity in appearance is no proof of identity in composition. Some of the evidence I have on this point is given in the succeeding paragraphs.

Chemical Composition.—No one has attributed to the commercial carbonate anything like an unvarying composition, but it seems to be universally accepted that this does usually approximate pretty closely to that expressed by the formula—

$$(CO_2)_3(OH_2)_2(NH_3)_4,$$

which has in 100 parts—

Carbonic anhydride	55·93
Ammonia	28·81
Water	15·26

And it cannot be denied that in the main the published analyses of it indicate that such is its approximate composition.

The following table contains all the published results of analyses that I have come across:—

	Date.	Carb. anhy.	Amm.
Bergman*	1774	45·	43·
Dalton*	1813	59·	24·5
Ure†	1817	54·5	30·5
Phillips‡	1819	54·2	29·3
Thomson§	1820	55·70	26·17
John Davy* . . .	1834	54·58	27·39
Rose*	1840	—	28·66
,, ...	—	—	30·70
,, ...	—	50·55	—
,, ...	—	53·40	—
,, ...	—	56·23	—
Ure‖	1853	55·89	28·86

Dalton deduced from his numbers the atomic composition since universally adopted; and if these numbers are compared with those he used to express the composition of the acid carbonate, they are found to agree closely enough with the calculated numbers.

I have analysed several samples of the carbonate at present in commerce, and have found that it is very uniform in composition with one special exception, and that this composition is no longer that represented by the formula

$$(CO_2)_3(OH_2)_2(NH_3)_4,$$

but by that expressed by the simpler formula,

$$(CO_2)_2OH_2(NH_3)_3.$$

This formula, represented by the symbols of the old atomic weights, becomes more complex than the other formula similarly represented; thus,

1st formula, old notation . . $(CO_2)_3(OH)_2(NH_3)_2$.
2nd formula, old notation . $(CO_2)_4(OH)_2(NH_3)_3$.

This, I think, had some influence on the selection of the formula. For Ure's analysis, which both here and abroad seems to have been the first which enabled chemists to adopt a formula for the commercial carbonate, agrees much more closely with the second formula than with the first. But then the first could be represented by the formula of an ammonium salt, thus,

$$2NH_4O, 3CO_2,$$

while the second could not. However, the results of other analyses corresponded more nearly with the formula adopted, and so strengthened the grounds of its selection.

The samples I have analysed were purchased at intervals over a period of two years or more, of different firms (though not of the manufacturers direct), at different prices and of different qualities. Small fragments, quite free from decomposed portions, were broken from the inside of lumps just before they were used for analysis. The following are the details and results of my analyses:—

The contents of one of the 7 lb. jars usually made up for the use of dispensing chemists was found to consist of fragments of a cake exhibiting different layers: (*a*), the outer layer, constituting the greater thickness of the cake, compact, translucent, imperfectly crystalline and of conchoidal fracture; (*b*), a much thinner layer, friable, semi-opaque; (*c*), a layer, apparently the innermost of the cake, hardly 2 millimetres thick, very translucent, prismatically crystalline:—

I. 1·085 grms. of (*a*) yielded, with hydrochloric acid, ·5952 grm. of carbonic anhydride to soda-lime;

II. 1·1600 grams of (*a*) neutralized a volume of standard sulphuric acid, equivalent to ·3783 gram of ammonia;

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* Memoir already quoted.
† 'Annals of Philosophy,' vol. x. p. 203.
‡ 'Quarterly Journal of Literature, Science and Art,' vol. vii. p. 294.
§ 'A System of Chemistry,' vol. ii. p. 413, sixth edition.
‖ 'A Dictionary of Arts, Manufactures and Mines,' fourth edition. Art. "Carbonate of Ammonia."

III. 1·0904 grams of (*a*) neutralized a volume of standard sulphuric acid, equivalent to ·3570 gram of ammonia;

IV. 1·1437 grams of (*a*) yielded with hydrochloric acid 1·1680 grams of ammonium chloride = ·3715 gram of ammonia;

V. ·9063 gram of (*b*) yielded, with hydrochloric acid, ·5006 gram of carbonic anhydride to soda-lime;

VI. 1·0538 grams of (*b*) neutralized a volume of standard sulphuric acid, equivalent to ·3468 gram of ammonia;

VII. 1·4405 grams of (*b*) gave, with hydrochloric acid, 1·4957 grams of ammonium chloride = ·4757 gram of ammonia;

VIII. ·9870 gram of (*c*) gave, with hydrochloric acid, ·5427 gram of carbonic anhydride to soda-lime;

IX. ·2490 gram of (*c*) neutralized a volume of standard sulphuric acid, equivalent to ·3137 gram of ammonia:

A sample labelled "commercial," indistinctly crystalline, of the rose-tint, often seen in carbonate made from gas-liquor:—

X. 1·4635 grams neutralized a volume of standard sulphuric acid, equivalent to ·4663 gram of ammonia;

XI. 1·0574 grams yielded, with hydrochloric acid, ·5775 gram of carbonic anhydride to soda-lime:

A sample purchased from the same firm as the last, but labelled "pure," identical in appearance with the last:—

XII. 1·5314 grams neutralized a volume of standard sulphuric acid, equivalent to ·4888 gram of ammonia:

A sample in sealed bottle, labelled "from volcanic ammonia," beautifully crystalline and translucent, devoid of colour, in thinner cakes than usual:—

XIII. ·9855 gram neutralized a volume of standard sulphuric acid, equivalent to ·3230 gram of ammonia;

XIV. ·9790 gram neutralized a volume of standard sulphuric acid, equivalent to ·3205 gram of ammonia:

A sample, labelled "optim," from a wholesale druggist's, not very crystalline, devoid of colour:—

XV. 1·0704 grams neutralized a volume of standard sulphuric acid, equivalent to ·3392 gram of ammonia:

A sample, purchased from the same firm as the last, labelled with a well-known maker's name, in two closely-adherent layers, of which one (*a*) was about twice as thick as the other, indistinctly crystalline, with conchoidal fracture, and the other and thinner layer (*b*) highly crystalline:—

XVI. 1·0261 grams of (*a*) neutralized a volume of standard sulphuric acid, equivalent to ·3230 gram of ammonia;

XVII. ·9667 gram neutralized a solution of standard sulphuric acid, equivalent to ·2188 gram of ammonia;

XVIII. 1·0443 grams gave, with hydrochloric acid, ·5785 gram of carbonic anhydride to soda-lime, and ·7250 gram of ammonium chloride, = ·2306 gram of ammonia.

These results, calculated for parts per cent., give the following numbers:—

		Carb. anhyd.	Amm.
a	I	54·86	..
	II	....	32·61
	III	....	32·74
	IV	....	32·48
b	V	55·24	..
	VI	....	32·91
	VII	....	33·02
c	VIII	54·98	..
	IX	....	33·05
	X	....	31·65
	XI	54·62	..
	XII	....	31·92
	XIII	....	32·78
	XIV	....	32·73
	XV	....	31·68
	XVI	....	31·48

(The calculated numbers for the results of the analyses XVII and XVIII, are entirely different from the others, and will be given and discussed presently.)

These numbers agree in the closest manner with the theoretical numbers, except that the presence of 1 or 2 per cent. more water is indicated than is required by the formula. Here are the calculated numbers for a compound of the formula,

$$(CO_2)_2OH_2(NH_3)_3,$$

—(1) when pure, and (2) when containing 2·5 per cent. additional water ($= \frac{1}{4}OH_2$):—

	(1.)	(2.)
Carbonic anhydride ..	56·05	54·65
Ammonia	32·48	31·67
Water	11·47	11·18
Additional water	....	2·50
	100·00	100·00

It will be seen, by comparing the numbers deduced from my analyses with these numbers, that all the samples examined had a composition lying between that of the pure compound, and one with 2·5 per cent. additional water. Another slight variation is, however, observable, namely, that the ammonia very slightly exceeds the calculated quantity—in the extreme cases to the extent of 1 per cent. But it will be seen that these variations from the calculated composition are immaterial so far as the determination of the atomic composition is concerned. When treating of the products of the distillations yielding carbonates of ammonia, and of the formation of the commercial carbonate, I shall have again to refer to these variations. I shall then, too, have to point out that a compound of the composition I find the carbonate of commerce to possess, is the commonest among these products of distillation. Rose also obtained and described carbonates having more nearly this composition than any other. For one of these he deduced the atomic composition expressed by the formula—

$$(CO_2)_5(OH_2)_4(NH_3)_8.$$

The sample to which he gave this formula yielded him numbers which correspond more closely with those calculated for a compound of the formula

$$(CO_2)_2OH_2(NH_3)_3$$

with 5 per cent. of additional water than with those for his formula.

By distilling the half-acid carbonate which crystallizes from solution, he obtained a product which agrees much more closely with my formula for the carbonate at present in commerce, with 8·5 per cent. additional water than with his formula—

$$(CO_2)_5(OH_2)_5(NH_3)_8.$$

Lastly, he obtained another compound from a residue from the distillation of one of the carbonates, and gave it the formula—

$$(CO_2)_5(OH_2)_{12}(NH_3)_8,$$

and this compound also yielded numbers corresponding much more closely to those indicating the commercial carbonate of the present time, associated with about 30 per cent. of water, than with those of the formula given to it by him.

The analysis of the commercial carbonate made by Ure in 1817 corresponds much better with the composition I find the carbonate at present to have, together with 4 per cent. additional water, than with that attributed to it.

It is of some interest to adduce proofs, other than analytical, that the carbonate now in commerce differs from that most generally in commerce formerly. Firstly, Rose found on distilling the ordinary commercial carbonate at a very gentle heat that the contents of the retort gradually liquefied. I have repeated his experiment, with the utmost care to proceed as slowly as possible, taking, for instance, about ninety hours' continuous and nearly uniform heating to distil about 250 grams, and obtained hardly any liquid at all; yet the products of distillation were less hydrated than those he obtained.

Secondly, as I have already pointed out, by distilling the carbonate at present in commerce with anhydrous calcium chloride, ammonium carbamate condenses. Now this allows of no explanation, unless the carbonate is admitted to have a different composition from what it used to have. The reactions in the two cases are expressed by the following equations:—

$$2(CO_2)_2OH_2(NH_3)_3 + 2CaCl_2$$
$$= 4NH_4Cl + 2CO_3Ca + CO_2 + \overbrace{CO_2 + 2NH_3}^{\text{To form carbamate.}};$$
$$(CO_2)_3(OH_2)_2(NH_3)_4 + 2CaCl_2$$
$$= 4NH_4Cl + 2CO_3Ca + CO_2.$$

Thirdly, the commercial carbonate loses by exposure a proportion of its weight corresponding closely with that calculated, as due to carbamate, from the formula deduced from my analyses.

Fourthly, its solubility is about twice as great as that of acid carbonate, and of this it contains about half its weight, according to the formula I have deduced for it.

Fifthly, its saturated solution does not seem as if it were charged with carbonic anhydride, as does that of the half-acid ammonium carbonate.

Commercial Acid Carbonate.—I have stated that I have found one special exception to the uniformity in composition of the commercial carbonate. This occurred in a crystalline layer intimately united to a barely crystalline layer of the ordinary composition. I have already given the results of my analyses of this layer of exceptional composition. Calculated into parts per cent. they give numbers nearly identical with those of the acid carbonate. This layer differed from the other, and the ordinary carbonate, in having scarcely any smell or any ammoniacal taste; in dissolving only slowly in the mouth; and in not losing its translucency by exposure to the air. The occurrence of the acid carbonate in commerce must be very rare, because its difference from the ordinary carbonate is so striking and such as to render it valueless for most of the purposes of pharmacy and medicine for which it is required. So far as I am aware, this occurrence has only once before been pointed out, and this was done nearly fifty years ago by Phillips,* who published his analysis of a sample which Henry and he had examined. Like the sample I have examined, this was more crystalline than usual. It must not, therefore, be concluded, however, that the acid carbonate in this form is essentially more crystalline than the ordinary carbonate of commerce; for this is often sent out by the manufacturer much more crystalline than the layer of the acid carbonate I have described. It was adherent to about twice its weight of the ordinary commercial carbonate, so that the cake as a whole had, therefore, the mean composition indicated for it by the 'British Pharmacopœia.' Thus:—

	Atomic wts.		Parts.
Commer. carb..... $(CO_2)_2OH_2(NH_3)_3$	157	or	2
Acid carbonate	79	or	1
	——		—
Ammoniæ carbonas, B.P. $(CO_2)_3(OH_2)_2(NH_3)_4$ ..	236	or	3

Whether this circumstance was accidental or intentional on the part of the maker I do not pretend to say.

The details of the analysis of this layer of acid carbonate have already been given. I have reserved till now giving the calculated numbers per cent. With them I place those of Phillips:—

	Calc.	XVII.	XVIII.	Phillips.
Carbonic anhydride ..	55·70	—	55·40	55·5
Ammonia............	21·52	22·63	22·08	21·16
Water	22·78	—	—	
	100·00			

The acid carbonate, it will be remembered can easily be obtained in the above form by distilling the ordinary form of it very slowly. In the remarks which follow on the commercial carbonate, it is to be understood that the usual variety only is referred to.

(*To be continued.*)

* "On the Bicarbonate of Ammonia." 'Annals of Philosophy,' vol. xviii. p. 110.

PLANTS AS MANUFACTURERS.*

We have been accustomed to admire plants for their beauty, to love them for their sweetness, and to prize them for the value of their products. But few have any clear notions concerning the arduousness of their labours, or the importance of the work which they perform. The life of plants seems to us a life of ease, a season of quiet repose, a waiting for all things to be done for them. Such views are wholly mistaken. No life is more fully occupied than that of a plant.

They are manufacturers, it is true, but we never hear the clink, crash, whirr, or deafening din of their machinery in motion. They darken the heavens with no reeking clouds of foul smoke, no hissing volumes of spent steam. They both spin and weave, but no rush of spindles or sound of shuttles is heard. They pack up millions of tons of goods for transportation to the furthest ends of the earth, without the aid of hydraulic pressure or huge packing-boxes. They lift thousands of tons of water and produce from the earth into the air without the help of cranes or lifting tackle of any kind. This noiselessness is the more marvellous when we remember that there is no division of labour in those plant factories. Each does all its own work for itself. Finishing-houses are unknown in these factories; and what perfection of finish we have in leaf and flower, and root and branch, timber and bark! What artist could meddle with but to mar the finish of fine fruit and glorious flowers. In design, in texture, in skill, and in finish plants are far in advance of all human manufactures. No skill of man can create a living daisy; but observe that humble plant, spreading its few simple leaves on the ground; it takes a few atoms of earthy matter, and compounds them with some raindrops and a sheathful of sunbeams, and forthwith the

"Wee, modest, crimson-tipped flower"

opens its eyes to gaze upon the sun.

The basis of all manufacture is raw material. Without this nothing can be made. Whence comes the raw material of plants? They are rooted to one spot, and have neither carriers, railways, nor fleets of merchant vessels at command. How, then, do they get the raw material to keep their factories going? In the olden times rocks were rent, avalanches rolled, water dashed and leaped with wild and hurried steps, strata were denuded and upheaved, volcanos shot out flames of fire and showered forth red-hot ashes, and myriads upon myriads of living things lived and died, and found graves in this great globe—the earth—before the raw material for the basement floor of this great plant manufactory was provided. And now plants draw their raw material from the earth, from the waters above, upon and under the earth, and from the invisible air.

The wind is freighted with fresh supplies of raw material for plants, the clouds are their water carriers, the lightning their swift-winged messenger to announce their wants in cloudland or across the earth or ocean, and bring back tidings of coming cargoes. The four so-called elements of the ancients—earth, air, fire and

* Abstracted from a paper by Mr. D. T. Fish, published in the *Gardeners' Chronicle.*

water—are laid under contribution by plants. They absorb and utilize matter in all states and conditions,—solid, liquid, gaseous, visible and invisible, clean or foul, come equally welcome to plants. We hear of great things being done by the use of waste. Old and apparently useless matters are torn up and fined down, and new products spring forth as if by magic. Fortunes have been built up out of shoddy. Plants are likewise distinguished in this line. Theirs is the largest shoddy factory in the world. They are Nature's universal scavengers, always sweeping up, utilizing, transforming, glorifying, dirt, shoddy, waste, and converting it into products of the highest value. Nothing escapes the keen, eager search of plants. They question the winds in their hurried courses, and ease them of their loads. They invite the dew to adorn them with its necklace of pearls, that they may drink in its nourishing sweetness. They tenderly, firmly hug all kinds of earth, that they may take all they need for themselves out of it. They run up into, and wave themselves about in the air, that they may feed upon its carbon and ammonia. In one word, their field for the supply of raw material is the world; and having done their best to empty it, they turn their pleading flowers and inviting leaves towards the sun, and proceed to do their utmost to absorb all its heat, to use up its light, to exhaust its chemical forces, and empty it of its energia, or life-giving powers. Such is the baldest possible outline of some of the chief sources from which plants draw their supplies of raw material.

No sooner are their factories furnished with these than forthwith they hasten to convert them into finished products. But to this end motive power is needed. Rest is the grave of production, motion its life. Plants form no exception to the general laws. They can manufacture nothing without moving force, and that force is never absent unless it is bound in the iron fetters of frost, or arrested by the colder grasp of death. True we cannot hear the rush of the sap; the heat that quickens falls softly on leaf and flower. Chemical compositions or decompositions which are incessantly proceeding in plant factories give forth no sound. The lightning plays among leaves and flowers without scorching spot or hissing noise. The energia of the sun stimulates the life of the plant to the utmost, though the summons to awake is unheard by mortal ear. But is there, therefore, no motion? Nay, are not all the greatest movements in Nature silent? We hear not the stars in their hurried courses. The daily revolution of the globe gives forth no crashing intonation.

The motive powers used in plant factories are various, —heat, light, chemical affinity, and life are probably the chief. It is impossible to dwell upon either of them. Life and heat are perhaps the most important, and between them they do an amount of work that is perfectly astounding. We know little of either; possibly they are closely related, almost synonymous. The sun in a secondary sense may be said to be the source of both, but they work everywhere to produce motion. Between them they set and keep all the fluids of plants in perpetual movement, and these fluids are the carriers of nearly all that is needed to build up structure and manufacture produce. Independently of the force expended on production, plants perform other and highly important work. They pump a great proportion of the water of the world, and thus enrich and fructify by watering the earth. The sun is the greatest, strongest raiser of water. But the sun and the atmosphere draw their supplies chiefly from the surface of the earth, rivers and oceans. The roots of trees go deeper down for their water, and the leaves distribute this water at a high elevation. What the force of steam is to your factories, these and other forces are to plant manufactories. They pervade, move, quicken, drive the entire machinery of production. Every part of the plant is set to work in extending, spinning, weaving, transforming, finishing something. The designs are most perfect, the products more varied than can be enumerated or imagined. Do you ask what plants make? Rather inquire what they do not make. They make fruit, flowers, corn, wine, oil, gum, resin, pitch, timber, cotton, flax, fibre, tea, coffee, starch, rice, spices, acids, perfumes, and medicines. They have mainly formed the tilth of our fields,—they constitute our coal measures. And all these things are made out of the most unlikely elementary materials.

Consider the lilies, the roses, the violets in their sweetness; the orchids in their gorgeous colouring and marvellous beauty of structure, perfect mimics of some of the most exquisitely and elaborately formed insects. Look at the oak-tree in its strength, and the tiniest moss in its shrinking weakness; then remember that a few morsels of solid matter, a few drops of water, some fleeting sunbeams with invisible food searched out of the air, have formed them all. These are brought in to those marvellous manufactories, plants, and forthwith duly delivered is all this beauty, sweetness and glory. The transforming powers of plants are beyond comprehension. For what skill of man could compound such a varied bouquet of sweet odours from such crude elementary matters as these?

Do you ask if over-production is ever known in these plant factories? Well, sometimes, though it is not the evil that it is among us. For their very act of production is almost as serviceable to us as the products manufactured. Incidentally, as it were, the mere working of plants fills our rivers and purifies our air. Then there is no waste in Nature: "Gather up the fragments that remain, that nothing be lost," is her constant practice. What is not needed to-day will be wanted to-morrow. There is a case in point. Ages ago the world seemed in danger of being engulfed beneath the *débris* of plants. The strongest forms of plant life, stimulated by a hot steaming atmosphere, rushed up as if by magic. They decayed almost as rapidly. Decomposition added fuel to the energy of growth. The living fed upon the dead. A great contest raged throughout many ages between life and death. Production and destruction, growth and decay, ran a neck-and-neck race for the mastery of the world, and production won the race. The earth groaned beneath its huge load of carboniferous *débris*. At last its back bent and broke with the sheer weight, possibly; then there came a subsidence or overflow—a hotpress of fresh strata rolled over—and the coal measures were formed. And now, at the present moment, we are warmed by the heat, lighted by the light, and derive most of our working force from the energy of primeval suns. Had we seen all this, we should have cried out what a shameful loss! but a greater than man said "Gather up the fragments" for the homes, the factories, the railways, the steamships of my great family in the nineteenth century, and all succeeding ages. And thus it came to pass that we filled our coal cellars with the carbon of the old world.

(*To be continued.*)

Colonial Tobacco.—The success which has attended the introduction of tobacco cultivation into some of our colonies will give fresh encouragement to those who are working in this department of economic botany. We learn from *Nature* that samples of Latakia tobacco grown in Jamaica have been submitted for approval in London and reported upon favourably, while in India the seeds of the best varieties are being distributed in the districts most suited to the cultivation of the plants. From Natal a sample has just been received, which, in the opinion of an eminent firm of tobacco-brokers in the City, is a very near approach to what colonial tobacco should be. It is of good substance and of a fair light brown colour. If carefully packed, it would probably fetch the price of 5*d.* to 5½*d.* per lb. in bond, and meet a ready sale in the London market.

The Cost of Dimples.—Those who pay fair prices for good wines should be alive to a kind of imposition which makes them pay nearly twice the nominal price for what they drink. Six bottles of brandy or wine are popularly supposed to make a gallon, and six reputed quarts do fairly make up the gallon. Mr. A. H. Church has been at the pains to measure the contents of some reputed quart bottles in which different wines and brandy were sent out by a respectable house. They contained in nearly every instance less than two-thirds of the full measure. Port at 66*s.* a dozen was really sold at 82*s.* full measure. Cognac at 60*s.* was sold at the rate of 86*s.* full measure. Santo was sold at 48*s.* a dozen; the bottle consisted of only twenty-two ounces, instead of forty, and the cost was, therefore, at the rate of 87*s.* Even the 20*s.* Roussillon bought by the bottle counts up to 30*s.* a dozen. The kick or dimple in each bottle often holds as much as a small tumbler. Evidently dimples are a considerable and probably a not sufficiently considered item in our family expenditure.—*British Medical Journal.*

Monkey Nuts.—The pods of the ground nut (*Arachis hypogæa*), commonly known by the name of "monkey nuts," chiefly used for the expression from the seeds of a light-coloured bland oil, said to be extensively used for mixing with olive oil, are now reported to be used in America for making so-called chocolate. For this purpose they are beaten up in a mortar and the mass compressed into cakes; and it is said to form a most agreeable chocolate, without a particle of true cocoa. The Americans also prepare the seeds as a dessert sweetmeat by parching them and beating them up with sugar.—*Nature.*

The Manufacture of Grape Sugar from Corn.—The *Boston Journal of Chemistry* says that large factories have been established in New Orleans, Buffalo, and Brooklyn, for making grape sugar from corn. The latter is steeped in weak soda lye, for the purpose of softening the husk and gluten, and is then ground wet and run through revolving sieves to separate impurities. It is afterwards made to flow through ways or troughs, in which the starch gradually settles as a white powder. The wash water is run into a large cistern, and allowed to ferment and produce a weak vinegar. The starch from the troughs is put wet into the mash-tub, and treated with water containing one per cent. of sulphuric acid, for eight hours. The acid is neutralized with chalk or carbonate of lime, and the liquid evaporated to get rid of the gypsum; it is afterwards further evaporated in vacuum pans and run into barrels ready for crystallization.—*Nature.*

Sulphurous Acid.—Dr. Wilks reports that he has used sulphurous acid with great success in cases of typhoid fever. He says that it "arrests the development of the fever poison, and by continuing this arrest long enough the fever is exterminated. Briefly, it is an antidote."—*British Medical Journal.*

Chilblains.—In a letter to the *Lancet*, Dr. Fergus says "that sulphurous acid is a remedy that has a surprising effect upon chilblains, especially in their irritating tormenting stage. The acid should be applied with a camel-hair brush, or what is better, by means of a spray-producer. One application by the latter method usually effects a cure." A good wash for hands or feet affected is sulphurous acid, three parts; glycerine, one part; water, one part.

Pill Knives.—Mr. Carre, of Meaford, writing to the *Canadian Pharmaceutical Journal*, recommends the use of a tool something like a carpenter's chisel for reducing stiff extracts and masses. It may be made from a stout pill-knife, by cutting the round part of the end to a square shape, and grinding both sides to an edge. This will thoroughly clean the slab as well as blend the mass most effectually. He says the pestle and mortar are nowhere beside it.

The Use of Ammonia in Snake Bites.—Mr. F. G. Adye-Curran, M.B., Assistant-Surgeon to the 83rd regiment, reports in the *Lancet* a case in which the ammonia remedy was tried without success. A native butler noticing a cobra di capello to emerge from a rat-hole, immediately informed his master, who came and fired at the cobra, wounding it in the neck, but not killing it. The butler, who was partially intoxicated at the time, seeing the cobra trying to make its escape, caught hold of the reptile by the tail, when it turned sharply round and bit him in the index finger. He was immediately removed to the hospital, where a tourniquet was placed on the arm and wrist, the finger freely lanced and ammonia and ipecacuanha applied, while ammonia and brandy were given internally. The wound was sucked and the patient kept awake; but in spite of every effort he died four or five hours after being bitten. A curious circumstance in connection with this case is that the patient expressed himself as feeling no pain, and the usual symptoms of snake poisoning were absent.

HULL CHEMISTS' ASSOCIATION.—ANNUAL SUPPER.

The Annual Supper of the Hull Chemists' Association was held on Wednesday evening, December 7th; about thirty-five members attended. The chair was occupied by Mr. J. Baynes, and the vice-chair by Mr. Anthony Smith.

After the usual loyal and local toasts had been drunk, Mr. Preston proposed "Success to the Chemists and Druggists' Association," observing that the members of the Association numbered more this year than last year.

The Chairman, in replying, stated that the Society had made material progress during the past fifteen months, and he had hopes that it would be an enduring and lasting Association.

DRUG MARKET NOTES.

The old and esteemed preparation Compound Extract of Colocynth may shortly have to find a substitute, for at the present time the officinal cardamom is almost entirely absent from commerce, and it is seldom that a parcel of true Socotrine aloes is now offered for sale.

The following were among the parcels of drugs offered for sale last week:—

Aloes,—Cape, 54 cases.
Galls,—Turkey, 37 bales.
Castor Oil, 354 cases.
Gum Kowrie, 19 bags.
Opium,—Turkey, 98 cases; Persian, 25.
Otto of Roses, 17 vases; and 850 ounces.
Ylang-ylang, 2 tins.
Senna, 124 bales; Alexandria, 64 cases; Bombay, 10 bales; Tinnevelly, 177 bales.
Chiretta, 126 bales.
Sarsaparilla, 19 bales.
Bark, 75 packages, 52 bales; Peruvian, 33 serons; Guayaquil, 5 serons; Crown, 105 packages; Calisaya, 27 serons.
Ipecacuanha, 5 serons; Carthagena, 9 packages.
Cutch, 11 cases.
Aconite, 2 cases.
Sandal Wood, 3 tons.
Matico, 7 bales.
Rhubarb, 168 chests.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 17, 1870.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

POISON REGULATIONS.

WE this week give a report of the proceedings at the Council Meeting of the 7th inst. It will be seen that the Committee appointed to report on the subject, recommended that poisons should be kept with some distinctive mark in addition to the names of the articles; also, that they should be kept in a closet, etc., specially set apart for them, or in vessels distinguishable by the touch, or in vessels closed in a manner different from the way in which non-poisonous articles are kept. On the motion that these recommendations should be proposed to the Annual Meeting, an amendment was moved to the effect that poison regulations were not necessary under existing circumstances. This amendment was lost, as well as another declaring the need for an expression of opinion by the country trade before the adoption of any regulations. The original motion was then put and carried by a majority of six out of fourteen members present.

As the matter now stands, therefore, the regulations recommended by the Committee will be presented by the Council to the Society at its General meeting, for adoption as regulations that every one in the trade will be compelled to observe, so that the poisons in his stock are kept in such a manner as to come within the terms of the regulations.

In connection with this important subject, we must also call attention to a letter from Mr. HAMPSON, the terms of which seem to suggest the possibility of open war and determined resistance to the action taken by the Council. From the neutral ground necessarily held by the Editor of this Journal, it would be obviously improper to comment on a position of such gravity any further than to express the hope that, whatever contest may be deemed indispensable, the real interests of Pharmacy, as a craft, will not be lost sight of or damaged in the endeavour to support any view less catholic in character.

THE LANCET AND PHARMACEUTISTS' CHARGES.

OUR contemporary, the *Lancet*, must, we think, by this time have become aware that the sentiments to which it has given expression in reference to the charges made by pharmaceutists for medicines supplied to the public, do not find acceptance either with the leading members of the profession or with the bulk of the general medical practitioners of the country. Indeed, though our contemporary has returned once and again to the charge, it has had to disclaim the idea that druggists' charges are generally, or even frequently extortionate; and it has only succeeded in making the unpleasant impression upon pharmaceutists that its strictures were dictated by a self-interested clique, seeking to gain a personal advantage at the expense of the dispenser, and thinking that if less be paid for physic, there will then be more room for visits, whilst it has elicited from the medical profession itself but very few instances of exceptionally high charges,—even then the statements have been unauthenticated by the names of the writers, and pharmaceutists themselves have condemned in still stronger terms the charges alleged to have been made in those instances, as altogether unusual and unjustifiable.

But in the face of the document published in last week's Journal, setting forth for general adoption by the medical profession a tariff of fees which should be charged by the profession for medicines, the strictures of our contemporary must appear very impolitic indeed, and the more unjust, since the charges in that tariff are altogether higher than those of any leading pharmaceutists. This document describes the scale of fees to be such that the humblest member of the profession need not hesitate to make it the basis of his charges,—a rate suggested, indeed, rather in accordance with past usage than from any consideration of what is essential to maintain the proper status of the profession,—due regard being had to the diminished value of money and the increase of wealth among the several classes of the community, considerations, we would say, that should be as fairly applied to the pharmaceutical as to the medical profession.

And what is the tariff which is so moderate? It is based upon house rental of patients, and recognizes three classes, those who pay from £10 to £25, those who pay from £25 to £50, and those who pay from £50 to £100 a year. Now, although it is held that medical men should be paid for their advice, "drugs" being thrown in when supplied by medical practitioners; yet we have a special scale given for medicines alone, and a very wide difference is observed in the charges suggested where medicines are supplied in the one case and not in the other. For instance, for an ordinary visit within the postal district, including medicines, it is suggested that the fees should be respectively for the three classes, 2*s*. 6*d*. to 5*s*.; 3*s*. 6*d*. to 7*s*.; and 5*s*. to 10*s*. 6*d*.; for visits, exclusive of medicines, for the same classes respectively, 1*s*. to 2*s*. 6*d*.; 1*s*. 6*d*. to 3*s*. 6*d*.; 2*s*. 6*d*. to 5*s*., that is to say, the difference where medicines are supplied in each case respectively, from 1*s*. 6*d*. to 2*s*. 6*d*.; 2*s*. to 3*s*. 6*d*.; 2*s*. 6*d*.

to 5*s.* 6*d.* In fact the medicine is charged as much as the visit and more than chemists now charge, as will be seen by reference to the table we published last week.

This tariff speaks for itself, and it is unnecessary to point out that the charges are altogether above those made by pharmaceutists furnishing the purest drugs, and specially trained to the most accurate and careful dispensing. We do say, in conclusion, that the mouth of the *Lancet* is effectually closed upon this question, by the fact of these charges being sanctioned by a body of medical men after careful deliberation, and more especially by the commendation of the report in which they are recommended by the organ of the largest medical association in the United Kingdom. At least, those who live in glass houses must not throw stones.

We deprecate the discussion of this subject in the spirit that has been manifested by some writers, and especially regret to find the charge of extortion again launched against druggists indiscriminately and anonymously in the pages of the *Lancet*, as is done in the following letter which appeared there last week; and in the paragraph referred to, which has gone the round of the papers :—

"Sir,—The accompanying quotation (the substance of which is stated to have originally appeared in the *Lancet*) tends strongly to confirm the opinion that druggists' charges are frequently so exorbitant that one of two courses must be adopted in order to afford those medical practitioners, whose patients are chiefly of the working classes, a better chance of getting recompense for their services by preserving to their comparatively poor patients much of the money now extorted from them in the shape of enormous charges by druggists for the medicines prescribed.

"That the case of overcharge referred to in the *Lancet* is far from being a solitary one is quite certain. I can adduce others, and I doubt not that most medical practitioners, who know the original price of drugs, can do so also. The charges, or rather over-charges, may not be, as a rule, so great as in the example recorded by your correspondent; but I know that they are very frequently excessive, and, in justice to medical practitioners and their patients, such extortion ought to be brought to an end.

"To remedy the evil, one of two courses, as I have already said, seems necessary—either let the medical practitioners in towns unite and have a laboratory, from which their patients may obtain their medicines at a price merely sufficient to cover all expenses connected with the laboratory, or let every practitioner supply his own patients with the medicines he may prescribe for them. Superfluous professional pride must be cast aside.

"I am, Sir, yours truly,

"JUSTICE.

"*Edinburgh, Nov. 26th,* 1870."

The following is the paragraph referred to in the above letter:—

"DRUGGISTS AND THEIR CHARGES.—A medical correspondent of the *Lancet* relates that not long ago he was informed by a young lady for whom he was prescribing, and who had been some little time under his care, that she could no longer afford to take the medicine ordered, as she was charged 4*s.* for every six ounces of it. Thinking there must be some mistake, the doctor sent for the druggist who supplied his patient with the compound, and inquired the reason of the exorbitant charge. The druggist assured him it was the usual charge made by other people as well as by himself. This, however, did not satisfy the doctor, who put on his hat, went straight to the nearest druggist's shop, and returned triumphantly with a bottleful of the same physic, for which he had paid only 1*s.* 6*d.* for the six ounces, or at the rate of 9*s.* for thirty-six ounces instead of £1. 4*s.* Unless the first druggist had the excuse that he thought the medicine prescribed would do the young lady more harm than good, and therefore put difficulties in the path, his conduct is unjustifiable; but the case shows how necessary it is for invalids to study their druggist's bills instead of, as at present, jumping to the conclusion that the more disagreeable the taste the higher should be the charge for the medicine. Probably by taking a little trouble in selecting an honest druggist, the same physic may be obtained cheap and nasty, and quite as effectual. —*Pall Mall Gazette.*"

Nothing could well be more vague and unsatisfactory than these quotations, considering the nature of the imputation they convey. As a contrast to them, we refer to the letters published this week in our correspondence columns, and, at the same time, as a remarkable illustration how little ground there is for the strictures we complain of, we may point out that complaints have reached us from several quarters of the unreasonably low prices charged by some druggists for medicine. Complaints of this nature have actually been made by medical men.

YEAR-BOOK OF PHARMACY.

THE members of the British Pharmaceutical Conference will learn with pleasure that the Year-Book is completed, and that as soon as the transactions of the Association are in type, the whole volume will be ready for distribution. We are enabled to state that besides ordinary intelligence relating to English and Continental Pharmacy, several papers have been contributed by Mr. JOHN CARGILL BROUGH, on Chemical Nomenclature and Notation, and on the Anæsthetics. An attempt has been made to represent the present state of American Pharmacy; an elaborate *précis* on the Cinchonas, and the organic bases described in the Montpellier prize thesis of Lacote, together with additional translations from the French and German, have been added by Mr. JOSEPH INCE. The autobiography of Mr. DEANE, properly belonging to next year's record, has been republished by general request.

WE understand that the Chair of Chemistry at St. Bartholomew's Hospital has been filled by the election of Mr. W. H. RUSSELL, who has been for some time Lecturer on Chemistry at St. Mary's Hospital Medical School.

WE notice with pleasure that active measures are being taken to establish a local Science College at Liverpool, and that a considerable sum has already been raised for carrying out the project.

Proceedings of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

December 7th, 1870.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Abraham, Bottle, Bourdas, Brown, Deane, Dymond, Edwards, Evans, Groves, Hills, Savage, Stoddart, Sutton and Woolley.

The minutes of the last meeting were read and confirmed.

Resolved unanimously—That Mr. John Williams, of 5, New Cavendish Street, be elected a member of the Council in place of Mr. Brady, resigned.

The President read the following letter:—

"*Plough Court, Lombard Street, E.C.*
"*2nd November*, 1870.

"My dear Sir,—I find myself unable at present to give the time and attention necessary for the right discharge of the duties of a member of the Council of the Pharmaceutical Society, and therefore I beg leave to tender, through you, my resignation of the position to which I have had the honour of being elected.

"It is with great reluctance and sincere regret that I feel compelled to take this step.

"Had I fully foreseen what membership of the Council involves, and how incompatible it would be with additional claims on my time and attention, which have recently devolved upon me, I would certainly not have allowed myself to be nominated, and I feel that an apology is due from me in having thus erred in consenting to serve.

"If I can be of use until the vacancy is filled, I shall be glad, and at any time if I can be of service to the Society, in the prosperity of which I feel a deep interest, it will afford me great satisfaction.

"I am, my dear Sir, yours very truly,
"CORNELIUS HANBURY.

"GEORGE WEBB SANDFORD, Esq., *President*,
"Pharmaceutical Society."

Whereupon it was

Moved by Mr. Deane, seconded by Mr. Hills, and

Resolved—That this Council accept with great regret the resignation of Mr. Cornelius Hanbury, and trust that at some future time he may again occupy a seat at the Board.

The Report of the Finance Committee was presented, showing on the General Fund account a balance in the Treasurer's hands of . . . . £853. 16*s*. 11*d*.
Submitting for payment accounts amounting to . . . . £680. 6*s*. 10*d*.
On the Benevolent Fund account, after purchase of £461. 12*s*. 0*d*. Consols, a balance of . . . . £64. 18*s*. 11*d*.

Resolved—That the Report be received and adopted and payments made.

On the Report of the Special Committee appointed to examine the apparatus offered by Dr. Redwood, and report to the Council as to its condition and value to the Society, it was—

Resolved—That the collection of apparatus belonging to Dr. Redwood and offered to this Society be purchased for the sum of £300.

Resolved—That the recommendation of the Special Committee on Dr. Redwood's apparatus that certain apparatus be from time to time lent to Provincial Associations be referred to the Library, Museum, and Laboratory and Provincial Education Committees, acting conjointly, for consideration, and that in the event of the Committee being of opinion that such loans could be made, that they cause a list to be prepared and presented with their Report to the Council of apparatus they recommend for the purpose, with suggestions as to rules and regulations to be observed.

Resolved—That the Report of the Library, Museum and Laboratory Committee be received and adopted.

Resolved—That this Council authorizes the President and Vice-President to arrange for the delivery of a lecture on the first Wednesday evening in February, 1871, in the Theatre of the Society.

Resolved—That the Report and recommendations of the House Committee be received and adopted.

The Report of the Sale and Keeping of Poisons Committee, recommending the following Regulations to be submitted to the Annual Meeting, was presented:—

PROPOSED REGULATIONS AS TO THE KEEPING OF POISONS.

1. In the keeping of poisons, each poison shall be kept in a box, bottle, vessel, or package, and labelled, in addition to the name of the article, with some distinctive mark indicating that it is poison.

2. In the keeping of poisons, ALL, OR ANY, OR ONE of the following systems shall also be used:—

I. The boxes, bottles, vessels, or packages, containing poison shall be kept in an apartment, cupboard, compartment, or drawer, set apart for dangerous articles.

Or if not so kept apart.

II. The bottles or vessels, used in any shop or dispensary to contain poison shall be distinguishable to the touch, and shall be unlike the bottles of vessels used to contain articles which are *not* poisonous or dangerous, in the same shop or dispensary.

Or otherwise.

III. The bottles or vessels used in any shop or dispensary to contain poison shall be tied over, capped, locked, or secured in a manner distinguishable from the way in which ordinary articles are kept.

Moved by Mr. Dymond, seconded by Mr. Abraham,

"That the Report and recommendations of the Sale and Keeping of Poisons Committee as to the Regulations to be proposed to the Annual Meeting be received and adopted."

Amendment—Moved by Mr. Brown, seconded by Mr. Woolley—

"That as the law already provides for the punishment of carelessness and prescribes due labelling, it is undesirable to issue regulations for the keeping and dispensing of poisons, as no evidence has been adduced showing that regulations are necessary, the large majority of chemists already observing all needful precautions, and considering the provisions for improved education and increased responsibility, they ought not to be subjected to any further restrictions, unless it may be considered desirable in the interests of the public to apply the same to all dispensers of medicine, including surgeons, etc., naval, military and hospital dispensers and others."

For the Amendment—

Messrs. Brown, Bottle, Savage and Woolley.

Against—

Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Groves, Haselden, Hills, Sandford and Stoddart.

The Amendment being lost, a further Amendment was moved by Mr. Woolley, seconded by Mr. Brown—

"That before adopting any regulations for the keeping of poisons it is desirable to have an expression of opinion from Chemists throughout the country, irrespective of the decision of the annual meeting, and that circulars be issued asking if such regulations are desirable or not; one month to be allowed for reply, and the result considered at the February meeting of Council."

For the Amendment—
Messrs. Brown and Woolley.

Against—
Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Groves, Haselden, Hills, Sandford and Stoddart.
Messrs. Bottle and Savage did not vote.

The Amendment again being lost, the original Motion was put as a substantive Motion, and the following division took place:—

For the Motion—
Messrs. Abraham, Bourdas, Deane, Dymond, Edwards, Groves, Haselden, Hills, Sandford and Stoddart.

Against—
Messrs. Bottle, Brown, Savage and Woolley.

The Motion was therefore carried.

Resolved—That the Report and recommendations of the Parliamentary Committee be received and adopted.

Resolved—That the Registrar be instructed, and is hereby authorized to remove from the Register of Chemists and Druggists, the name of Ambrose Lloyd, of 16, St. Andrew's Road, Southampton.

BENEVOLENT FUND.

A grant of £15 was made to an applicant (Registered Chemist and Druggist) at Brighton, for assistance from the Benevolent Fund.

REPORTS OF EXAMINERS.

ENGLAND AND WALES.

1870.		Candidates examined.	Candidates passed.	Candidates failed.
November 16,	Major	7	6	1
,,	Minor	23	19	4
,,	Preliminary Certificates approved } 2 for 1 person			
December 2,	Modified	45	27	18
		75	52	23

SCOTLAND.

November 22,	Minor	2	1	1
,,	Modified	2	2	0
,,	Preliminary	7	7	0
		11	10	1

The Secretary presented the name of a member who had paid his subscription for the present year since the 30th April last.

Resolved—That he be restored to membership upon payment of a fine of one shilling.

Resolved—That the following, having passed the Minor examination, be elected Associates of the Society:—

Ball, George	Ormskirk.
Glazier, Walter Henry	London.
Milton, Thomas, jun.	Henley-on-Thames.
Mountain, Robert	Harrogate.
Nead, Joseph	Trowbridge.
Riches, William James	North Walsham.
Springall, John B.	Norwich.
Stubbs, Tyson	Rye.
West, William	Leeds.
Wright, Thomas	Leicester.

Applications for grants having been received from the Leicester Chemists' Assistants and Apprentices' Association, and from the Sheffield Pharmaceutical and Chemical Association, it was

Resolved—That the applications for aid from the above Societies be referred to the Standing Committee on Provincial Education.

Resolved—That the Journal and Transactions of the Society be forwarded to the Norwich Chemists' Assistants' Association regularly as published.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An Ordinary Monthly Meeting was held on Friday, December 2nd; Mr. W. S. BROWN, President, in the chair. Messrs. Tysoe, Lane, Booth, Mercer, Dickenson, Clark and Carruthers were elected Associates.

Mr. J. T. SLUGG, F.R.A.S., then delivered a lecture on "Heat." The lecturer pointed out the effects of heat upon matter of every kind, and how necessary it was to the existence of both animal and vegetable life, also its power in inducing chemical action. He next explained the theory that heat is a motion of the molecules of matter, and that a warm body is one the molecules of which are in a state of vibration, communicating the motion to the surrounding ether, and producing the sensation of heat when the proper nerve is struck; also the striking analogies in the actions of light and heat. Reference was then made to the effect of various degrees of heat on different substances: the difference in their boiling-points; the absorption of heat accompanying liquefaction; the law of the expansion of bodies by heat and contraction by cold, some curious illustrations being given; and the exception of water and bismuth to the general rule. Heat was next considered as the great motive power in all kinds of work, the source of all force, energy, power, put forth in an infinite variety of ways and for an infinite variety of purposes. The question is, Whence is all this force derived? Is it from one common origin, or is it from many sources? The answer is, that all these forces, whether muscular or mechanical, have one common origin in the Sun. Several calculations were given that had been made as to the amount of light and heat emitted by the sun. The lecturer then explained the dynamical theory of heat, that force and heat are convertible in definite proportions, and gave several illustrations. Lastly, he alluded to the supposition that the sun's heat was maintained by the impact of innumerable small bodies with which it comes into collision.

A cordial vote of thanks was passed to Mr. Slugg for his interesting lecture.

HULL CHEMISTS' ASSOCIATION.

At a Meeting of the Members of the above Association, on Wednesday evening, December 7, the Chairman, Mr. J. Baynes, in the name of the subscribers, presented the Secretary and Treasurer, Mr. C. B. Bell, with a testimonial. In doing so, he said that that gentleman had spared neither time nor expense, but had used untiring efforts and energies on behalf of the Society. He had acted as Secretary and as Treasurer, and had carefully husbanded their funds. It had been felt that such valuable services ought to be acknowledged in some tangible shape, and on behalf of a large number of subscribers, he had to beg Mr. Bell's acceptance of a silver cup and salver. The salver bore the following inscription:—"Presented to Mr. C. B. Bell by the members of the Hull Chemists' Association, as a mark of their esteem, and in recognition of his valuable services as their Honorary Secretary."

The Vice-Chairman said the presentation was made by almost the whole Association to a gentleman who had done his best to raise the *status* of the trade without any consideration on his part of time and labour.

Mr. C. B. Bell, in accepting the presentation, said that whatever he had done was with the sole desire of furthering the interests of the trade, and he hoped the chemists and druggists would prosper still more.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Monthly Meeting of the above Society was held on Monday evening, in the rooms at 60, Fawcett Street; Mr. J. J. Nicholson in the chair.

Mr. Cockburn read a paper on Cinchonas, their history and uses, describing the sources of the plants, their method of cultivation, the various alkaloids obtained from them, and their relative value and medicinal uses.

In a discussion concerning the storing of poisons, a plan was proposed by Mr. Nicholson, and seconded by Mr. Sharp, by which a distinctive colour—as red—was to be used as a danger signal, and placed on every bottle, parcel, or cask containing poisonous substances.

Mr. J. Harrison moved an amendment, which was seconded by Mr. Sidgwick, "That this meeting views with apprehension any further restriction upon the storing and sale of poisons, placing more reliance upon the care and responsibility of individual members than on mechanical safeguards." This amendment was carried by a majority of thirteen to ten.

Mr. J. Harrison then moved "That in the opinion of this Society it is desirable that the exemption from service on juries enjoyed by Pharmaceutical Chemists, should be extended to all registered chemists and druggists." He asserted that the Juries Act, viewed in conjunction with the Pharmacy Act of 1868, was a gross and glaring injustice to the whole body of chemists and druggists, and that it was a violation of every principle of justice and right. He contended that, as chemists and druggists discharged the same duties, and incurred the same responsibilities, they ought also to enjoy the same privileges as Pharmaceutical Chemists.

The motion was seconded by Mr. Clarke.

Mr. Nicholson then moved an amendment that the law ought to remain as it is, contending that the exemption was granted to Pharmaceutical Chemists as a reward for their educational attainments.

The amendment, which was seconded by Mr. Sharp, was lost by a considerable majority, and the original motion was then put and carried.

It was announced that the next meeting of the Society would be held on January 16, when a lecture will be delivered by Mr. Aslin, on the metals connected with the industries of the district.

ASHTON AND DUKINFIELD CHEMISTS' ASSOCIATION.

The Second Annual Meeting of this Society was held in the Board Room of the Mechanics' Institute, on October 20; Mr. W. H. Waterhouse, President, in the chair.

A report was read in which it was stated that the last session had been a creditable and successful one. The average attendance at the monthly meetings had been fair, though not quite so good as might be wished. It was thought that with a little effort every member of the trade might attend at the convenient hour at which they were fixed. Members were urged to use their influence to secure the attendance of those who had not hitherto been present. Already a better and more united feeling had resulted from these monthly social gatherings. Now that the Association had attained the age of two years, it might be considered to have passed through some of the dangers incident to a state of infancy.

A special meeting was held last session for the purpose of considering the propositions of the Pharmaceutical Council as to the sale and storing of poisons. After lengthened discussion, in which careful consideration was given to the subject, some vigorous resolutions were passed, and sent to the Pharmaceutical Council and to the editors of the Pharmaceutical Journal and *Chemist and Druggist*, and the Society might be congratulated upon having taken some part in securing the postponement of those regulations for at least twelve months.

Twice during the past session the apprentices and assistants of the district had met the members there in social intercourse, a proceeding which in the interest of employers and employed, it was hoped would be repeated during the next session.

Three able and profitable papers had been contributed by members and read at the monthly meetings, (1) "Pharmaceutical Pioneers," by Mr. Bostock, Vice-President; (2) "Longfellow's Poems," by the President; (3) "Progress," by Mr. Avison.

Perhaps the most popular work in which this Association had been engaged, and which it was hoped to see repeated year by year, was the course of three able public lectures, one by Mr. Slugg, of Manchester, on "Spectrum Analysis;" another on the "Elements of Chemistry," by Mr. J. Waterhouse; and the final one by Mr. Siebold, of Manchester, on "Poisons."

The two former of these lectures were profitable to the Institution, the last one resulted in a small loss to the funds. It is hoped that at any future lectures this Association may organize, every member will do his utmost to render them successful.

The retiring officers were then re-elected, viz.:—Mr. W. H. Waterhouse, as *President*, Mr. Bostock, as *Vice-President*, Mr. Neal, as *Treasurer*, and Mr. E. Fisher, as *Hon. Secretary*.

Proceedings of Scientific Societies.

BRITISH ASSOCIATION.

The Executive Committee of the British Association met in the Council Chambers, Edinburgh, on Saturday; Professor Christison, one of the Vice-Presidents of the Association, in the chair. A remit was made to a Sub-Committee to co-operate with the Local Secretary and Treasurer in the preparation of a leet of gentlemen to form a Local Committee for making the requisite arrangements to receive the British Association in August next. The same Committee were authorized to communicate with the several public bodies in Edinburgh, Leith and Portobello, and to invite subscriptions from them to the fund which it will be necessary to raise for defraying the necessary expenses. Professor Christison stated that the Council of the Royal Society had agreed to recommend the Society to subscribe £100 towards the fund, and a hope was expressed that the several public bodies, as well as banks and insurance offices, would respond liberally to the appeal to be made to them. It is understood that a sum of not less than £1500 will be required to enable the Local Committee to carry out the requisite arrangements in a manner creditable to Edinburgh.

MEETINGS FOR THE ENSUING WEEK.

Monday, *Medical Society*, at 8 p.m.
London Institution, at 4 p.m.—"On Chemical Action" (Educational Course). By Professor Odling.

Tuesday, *Pathological Society*, at 8 p.m.

Wednesday, *Society of Arts*, at 8 p.m.—"On a Method of Lighting Towns, Factories, or Private Houses by means of Vegetable or Mineral Oils." By A. Silber.

Thursday, *Royal Society*, at 8.30 p.m.
London Chemists' Asssociation, at 9.30 p.m.—"On Sulphocarbolates." By Mr. J. Sands.

Friday, *Quekett Club*, at 8 p.m.

Parliamentary and Law Proceedings.

Action against a Druggist.

Cooper *v.* Mercer.

An action was brought in the Stoke County Court on Thursday, Dec. 1, by Josiah Cooper, a plasterer, residing at Longton, against George Mercer, a chemist and druggist, of the same place, to recover £25 damages, for injury sustained by him through the defendant giving him a packet of red precipitate powder whilst supplying him with seidlitz powders.

The case for the plaintiff was that on Saturday evening, the 29th May, he was served by the defendant with two seidlitz powders in four small packets, two wrapped in white paper and two in blue. The same evening his wife mixed him a draught of water and the powder contained in one of each of the blue and white papers, that in the white paper being of a pink colour. He drank about three-fourths of the mixture, leaving the rest, chiefly sediment, in the cup, and in a few minutes afterwards became very ill, and remained so all night, vomiting much, and being in great pain. Medical assistance was called in, and it was found that the sediment in the cup was of a poisonous nature. Plaintiff said that defendant wrapped the four packets up in paper before giving them to him, and he took them home so wrapped up. He was ill and unable to work for ten days, and had never been quite well since. He had never taken seidlitz powders before. He had had some drink a day or two before, and they were recommended to him by defendant. He called about ten days afterwards to ask for some compensation, which defendant refused to make. Plaintiff's wife spoke to mixing the draught taken by plaintiff, which, she said, did not effervesce. She sent for defendant to come up on the Sunday, and he came to the plaintiff's mother's house next door, where she saw him but did not speak to him. Plaintiff's mother stated that when defendant came to her house, he told her there had been a mistake; either he had given plaintiff a wrong powder, or plaintiff had picked a wrong one up. Mr. Dawes, surgeon, said he saw plaintiff about noon on Sunday, when he found him suffering from symptoms which were not compatible with natural disease. The sediment in the cup was shown him, and he perceived it consisted of red oxide of mercury, which was poisonous in large quantities, and would produce the symptoms exhibited by plaintiff, from which it would take some time to recover. Several witnesses were called to prove that plaintiff was sober on the evening he got the powder.

In defence, it was contended that plaintiff had caused his own injury, or contributed to it by his own negligence. The defendant was called and said he had before sold seidlitz powders to the plaintiff, who knew their nature. He did not wrap up the seidlitz powders in question, but gave them, at his request, loose to plaintiff, who wrapped them up himself. There was a pile of small packets of red precipitate powders on the counter wrapped up in white paper, and amongst them he afterwards found a small packet of acid in white paper; he believed that plaintiff, who told him he had been drinking, had put it there, and taken up a precipitate powder by mistake. A fortnight afterwards, plaintiff called on him, and proposed to make the matter up for £1, or even 12*s.*, but he declined. Mr. Brough, chemist, Longton, spoke to plaintiff having frequently bought seidlitz powders from him.

Upon the judge expressing an opinion adverse to the plaintiff on the ground of negligence, he elected to be nonsuited.—*Staffordshire Sentinel, Dec. 3rd*, 1870.

Excise Prosecution.

On Saturday the Brentford magistrates were engaged some time in hearing a summons issued at the instance of the Board of Inland Revenue against William Austin, a bedridden shoemaker, residing at Isleworth, for selling certain pills without being duly licensed. The evidence showed that a supervisor of Inland Revenue, on September 29th, bought of defendant's wife a box of Dr. Mantle's gout pills for 1*s.* She said she had been selling them for years, and refused to say where Dr. Mantle lived. There was a Government label round the box, but there had been a loss of duty. Defendant's wife admitted having sold the pills for years, and said she did not know that she required a licence. The defendant was fined £5.

Reviews.

Supplement to the Pharmacopœia of India; or a Catalogue of Indian Synonyms of the Medicinal Plants, Products, Inorganic and Organic Substances included in that work, with Explanatory and Descriptive Remarks, etc., in Fourteen Languages. By Moodeen Sheriff, G.M.M.C. Printed and published by order of Government at the request of the Committee of the Pharmacopœia of India. 8vo. 676 pp. Madras. 1869.

Although bearing date 1869, this volume has only very recently reached this country. It was at first intended to have included the Indian synonyms in the new Indian Pharmacopœia; but, as such a course would have occasioned considerable delay, the work was published without them, the catalogue was somewhat expanded, and finally issued as a supplement. The table, originally prepared by Mr. Moodeen Sheriff, was composed of twelve languages, besides the Latin and English, viz. Arabic, Persian, Hindustani, Dukhni, Tamil, Telugu, Malyalim, Canarese, Bengali, Mahratti, Guzratti and Burmese, and the synonyms in all these languages were expressed in their native characters as well as in English. This Table was, in 1866, referred back to India for rearrangement in paragraphs, instead of the tabular form, and for the addition of the Cingalese and Sanskrit synonyms. It was then arranged that the work in its modified form should be printed at Madras, under the author's own supervision. Encouraged by the reception which his labours acquired at the hands of the Committee of the Pharmacopœia of India, Mr. Moodeen Sheriff set to work to revise his Catalogue, to accomplish which he states, "I have repeated the examination of medicines as before, and on this occasion obtained several supplies of them, with their names, from the bazaars of Calcutta, Hyderabad and Bombay, and a few other places beyond Southern India. This and the previous examinations have materially assisted me in removing many doubts and a great deal of confusion, and in finding out the correct names, as well as the true nature of many drugs and plants. In some instances the drugs were involved in such a confusion, that I was not able to clear it until I had actually raised the plants suspected to produce them from seeds; and in a few more, the only way I found to reveal the true nature of them, particularly with regard to their medicinal and other properties, was to take them internally myself."

From these remarks it will be seen that Mr. Moodeen Sheriff encountered his work in a right spirit, and the result has been the production of an exceedingly useful supplement to the Pharmacopœia, valuable, not only in India, but also in this country.

The first portion of the volume is occupied by the catalogue proper, arranged alphabetically, with the Latin names; as, for instance, *Abelmoschus esculentus*, W. and A. Then follow the Oriental synonyms, written first in English characters, expressed according to Sir Wm. Jones's method, and then in native characters. Afterwards, where remarks are required, these are given in a smaller type. There are 708 articles enumerated, to which a list of synonyms is furnished.

The next portion of the work is taken up with a table of the method of transliteration adopted for expressing the vernacular synonyms in English character.

Finally, the Appendix to the Supplement and the Indices occupy the latter half of the volume. The information contained in the thirty pages of the Appendix respecting obscure substances, or those but little known, is of much interest and value. The Indices are sixteen in number; one for each of the fourteen languages, one for the Latin names, and one for the English names. In some of the Indices the native characters, as in the body of the work, follow the names written in English characters. This brief summary of what the book contains will give some notion of the immense labour which it has entailed upon the writer, for which he deserves well of the medical profession, not only in India, but in this country, and also of all who are interested in Materia Medica. The promotion, by which the Government recognized his services, was no more than he deserved.

In concluding this notice we give our author's remarks on *sufed-musli*, which stands under the heading of ASPARAGUS ASCENDENS, *Roxb.*, at page 59.

"The *sufed-musli* of Southern India is the dried and splitted root of *Asparagus sarmentosus*. It occurs in thin and long pieces like strings, curled upon itself once or twice, varies in length from three or four inches to a span or more, of pale grey or dirty white colour, and devoid of any particular taste or smell. When the fresh root is splitted or torn longitudinally in three or four pieces and dried, it acquires the above condition. Although the dried root is often used by native practitioners, it is almost useless as a medicine; but when fresh, it is a nutrient and demulcent. In this state it is very fleshy and succulent, about a foot or a foot and a half in length, generally of the thickness of a finger, smooth and round, tapering to a very narrow and long point at both ends, of dull white or pale grey colour, no smell, and taste slightly demulcent. When a plant is dug out with these roots, it has a very singular appearance, as though a great number of large round worms were attached to it, and their number is often very great, amounting sometimes to about a hundred. The fresh root is distinguished in many parts of India, including Southern India, as *shaqaqul*, and its preserve, which is generally imported from China, is named *murabbahe-shaqaqul* or *shaqaqul-kamurabbah.* The above name is applied in Arabia, Egypt and Persia to some similar root, which is considered there to be the wild carrot or turnip. From its description in some books, I believe it to be a species of *Asparagus.* The *sufed-musli* of all other parts of India is the real drug to which that name is properly applicable, and it is the root of *Asparagus ascendens.* It is also procurable in Southern India, but under a different name, which is *shaqarule-hindi* or *Indian Shaqaqul.* It is a useful medicine, and a very good substitute for salep. It bears the following characters:—When new or not very old, this root looks like a thin, cylindrical piece of gum, partially translucent; very hard; whitish or yellowish grey; from one to two or three inches long, generally crooked, sometimes bent upon itself, and occasionally knotty; and of bland and mucilaginous taste. If some pieces be carefully examined, one of their ends will be found thinner and more pointed than the other, indicating their original tapering form. A few pieces are also flat or compressed, forming a kind of small irregular plates. When the root is very old, it is opaque and of light brown colour. With regard to the *kali-musli*, it is correctly the root of *Curculigo orchidioides*, as is mentioned and described in several books.

"The roots or rootlets of *Bombax malabaricus* bear no resemblance whatever to any of the varieties of the *musli.* When dried, they are as nearly useless as the dried root of *Asparagus sarmentosus.*"

This volume is very well "got up;" indeed it would hardly be suspected that it was printed in Madras, no small praise when many of the works printed in India are remembered.

THE CHEMISTS AND DRUGGISTS' ALMANAC AND DIARY, 1871. 8vo. 114 pp. *Chemist and Druggist* Office.

This book is a great improvement on all former editions, and is more than ever an indispensable counter companion to the pharmacist. The diary arrangement gives a page to a week, and just comfortable room for each day's memoranda. We do not think, however, that this part of the work will be fully developed till it attains folio magnitude; only then will it take its proper place on the desk.

The literature of the 'Almanac' comprises an exhaustive account of work done in Pharmaceutical Chemistry during the year 1870, by Professor Attfield; directions for performing the Gravimetric Tests of the British Pharmacopœia, by Mr. Tilden; and a paper on Chemical Tests for Medicinal Articles, by Mr. Sidney W. Rich; besides much information on legal and commercial matters, and innumerable hints of great value to every business man (most of them of especial value to the pharmacist) pushed into every spare corner. Dr. Attfield's paper omits nothing; from hydrate of chloral to Bouillon's method for forming pencils of any brittle caustic substance by incorporation with melted gutta-percha or paraffin,—everything finds appropriate mention. The notice of the artificial production of alizarine is very interesting. If the value of Mr. Tilden's contribution be measured by its length, a very unfair estimate will be the result. In very little space a remarkable amount of information is conveyed on apparatus, manipulation, etc., and of such character, that if the given directions be followed, the gravimetric tests of the Pharmacopœia may be performed by any pharmacist for himself. The manufacturer is at his mercy. In twenty-nine pages Mr. Rich makes us acquainted with every needful test for ascertaining the presence or absence of adulteration in chemicals and other articles of materia medica. The tests given are not simply those of the B.P.; a choice is offered. Cinchona, as its importance demands, has a good share of attention; and Carles' process for estimating the quinine value of barks is here side by side with the official one. Together, Messrs. Tilden and Rich furnish a complete system of the qualitative and quantitative analysis of the British Pharmacopœia.

On the very last page, side by side with the weights and measures, is a scale comparing the linear measures of the English and the metrical system. It shows clearly —and this mode of illustration cannot be too strongly recommended—that six inches are just equal to fifteen centimetres and two-fifths. We are sorry that it is the only notice of the metrical system to be found in the book.

There is one feature of this Almanac which we cannot commend, viz. that part which professes to be a "Trade Directory." Possibly we may not understand the principle upon which this has been constructed, but it seems very curious that such a directory should contain only four names under the head of "Drysalters," one name under that of "Comb-maker, etc." The lists of manufacturing chemists and wholesale druggists are also very meagre and imperfect. It is a pity that a good and useful work should be disfigured by anything so defective as this.

The Almanac deserves success, and will probably find its way into every pharmacy.

The following journals have been received:—The 'British Medical Journal,' Dec. 10; the 'Medical Times and Gazette,' Dec. 10; the 'Lancet,' Dec. 10; the 'Medical Press and Circular,' Dec. 14; 'Nature,' Dec. 8; the 'Chemical News,' Dec. 9; 'Journal of the Society of Arts,' Dec. 8; 'Gardeners' Chronicle,' Dec. 10; the 'Grocer,' Dec. 10; the 'English Mechanic,' Dec. 9; the 'Produce Markets Review,' Dec. 10; the 'Philadelphia Medical and Surgical Reporter,' Nos. 712 and 715; the 'Rock,' Dec. 9; the 'Eastern Morning News,' Dec. 8; the 'Maidstone and Kentish Journal,' Dec. 5.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[41.]—BATH POWDER and [47] SMALLPOCK-MARKS.—As no one appears to have sent the required information in reply to the above, I venture to say that the oxide of zinc, plain or scented, very finely sifted, is used as a toilet powder during the later stages of eruptive diseases. I have been told that in India its value is greater than in this country, the marks being larger in the warmer climates.—T. B. LANGRIDGE, *Midhurst.*

[42.]—CHILBLAINS.—*Lugoney* and *C. Bennett* will find this receipt of some use:—

℞. Lin. Belladonnæ ʒij
„ Aconiti ʒi
Acid. Carbolic. ♏x
Collodion Flexile ad ℥i.

Mix and apply with a camel's-hair brush. The above is for unbroken chilblains; if they are broken, the lin. aconiti is to be omitted.—A. T. GIRDLER.

[48.]—CRYSTALLINE POMADE.—*T. Stokoe* (Clare) says, "The formula given in Journal for December 10, 1870, is correct, but to obtain the crystalline appearance it is necessary to warm the bottles (I usually do so by immersing them in warm water) immediately before filling, otherwise a thin, opaque film is at once deposited."

E. M. sends the following:—

Castor Oil ℥iv
Olive Oil ℥iv
Spermaceti ʒvj.

Mix the spermaceti in the oils with a gentle heat.

A good scent for the same is—

Oil of Cassia gtt. xj
„ Thyme gtt. iv
„ Cloves gtt. xv
„ Lavender gtt. xxx
„ Lemon gtt. ij.

A similar recipe has also been received from "*Beta*" (York) and *M. H. Legg* (Edgware Road).

[64.]—COLD CREAM.—*E. M. S.* sends the following formula:—

℞. Cetacei ʒx
Ceræ Alb. ʒx
Ol. Amygd. Dulc. ℥viij
Aquæ Bullient. ℥iv
Sodæ Boracis ʒj
Otto de Rose ♏xl vel q. s.

Misce bene secundum artem.

Add ℥ij ol. amygdal. to the form given in last week's PH. J., and leave out the aqua rosæ, and you will get a cream that *will* keep well.—F. G. HOLMES, *Brill.*

A formula for the preparation of cold cream was given, *ante*, p. 340.

In the formula given last week, p. 477, *for* Otto de Rose gtt. ij, *read* gtt. xij.

[66.]—CEMENT FOR INDIA-RUBBER.—"*Vulcanite*" will find the following form all that he can desire:—

℞. Bisulphide of Carbon ℥iv
Best India-rubber ℥j
Isinglass ʒij
Gutta Percha ℥iss.

Dissolve. F. R. B.

[68.]—POT POURRI.—"*Iodi*" will find the following a good receipt:—

P. Cinnamon,
„ Cloves,
„ Mace, ana ʒiv
„ Orris ℥iv
Ess. Lemon,
„ Verbena,
„ Bergamot,
Ol. Lavand. ana ♏xl. SIGMA.

℞. Baccæ Pimento, coarsely powdered, ℥vj
P. Cinnamom. ʒij
Ol. Lavand.,
Ess. Ambergris,
„ Mosch., ana gtt. xij.

M. TOLU.

℞. Rad. Iridis Pulv. ℔j
Rad. Calam. Arom.,
G. Benzoes,
Bay Salt,
G. Storax, ana ʒiv
Caryophylli ʒj
Mace ʒss
Mosch. Gran. gr. viij
Ras. Santal Flav. ʒij
Florum Lavand. ℔ij.

M. S. A. TOLU.

[69.]—FRENCH ESSENCES.—The pomades made by *enfleurage* are generally used for the manufacture of essence in the proportion of 4 parts to 10 parts of alcohol 56 O.P. (·838), the pomades being rubbed through a sieve into the alcohol.

[70.]—DISPENSING. (*J. S. A.*)—It will be impossible to prepare the prescription as it stands,—soften the ext. belladonnæ in a mortar, with about ʒj of boiling water, and gradually mix the lin. camph.; it *will* separate under any circumstances. I do not consider this is to be regarded an unjustifiable addition, as the adding acid. sulph. dil. to a mixture containing quiniæ sulph., where none is ordered, most certainly is.—A. E. T.

H. H. Read (Peterborough) says,—Rub the ext. belladonnæ in a mortar with a few drops of water to a syrupy consistence, then gradually add the camph. oil, constantly stirring all the time.

If *L. S. A.* will weigh the camphor wanted for the ol. camph. and beat it up in a mortar with the half drm. ext. belladon. (use the alcoholic extract), then rub both up with two ounces olive oil, he will have a liniment similar to the one he inquires about.—WM. EVANS, *Liverpool.*

[72.]—COUGH BALSAM.—

Chlorodyn. ℥j
Syr. Tolu,
Scillæ, ana ℥iv
Antim. Tart. gr. x
Aq. ad ℥xx

Dose ʒj vel ʒij.

The chlorodyne is made according to Squire; the antim. tart. to be dissolved in hot water. The above is celebrated as the universal.—F. G.

[73.]—CHLORODYNE.—In answer to *M. P. S.*, wishing for a form for a soluble chlorodyne, I beg to offer him the following:—

℞. Morph. Acet. gr. lxiv
Acid. Acet. Dil. ℥ss
Acid. Hydrocyan. Sch. ℥iss
Ol. Menth. Pip. ʒij
Chloroform,
Æther. Rect.,
Tinct. Capsici, ana ℥ij
Theriacæ ad ℥xvj

Dissolve the ol. menth. pip. in the chloroform and ether, and put them in a bottle (wide mouth) capable of holding 2 lb., and which you have first graduated with a label to 1 lb. exact. Add the rest, all but the treacle, the morphia dissolved in the acid. acet. Make the treacle hot by standing it in a jug immersed in boiling water for about half an hour. This causes it to run easily, and any sediment will subside and be left in the bottom of the containing vessel. This hot treacle must be added to the other ingredients to make the whole measure 1 lb. It must be added carefully, an ounce or two at a time, and shaken gently, but as soon as it begins to cool, cork it up and shake well every few minutes until cold. —WM. G. TAPLIN.

[74.]—TOILET VINEGAR.—The following form is given by Piesse:—

Dried Rose-leaves ℥iv
Spirit of Roses triple ℥x (Otto ♏ix ad ℥j S. V. R.)
Dilute Acetic Acid ℥xl.

Macerate in a closed vessel for fourteen days.

I prefer this one.

Ess. Bergamot ♏xx
„ Ambergris ʒiv
„ Vanilla ♏xxx
Ol. Neroli ♏xxx
Acetic Acid ♏clx
S. V. R. ℥vj.

Mix. SIGMA.

W. B. S. (Bridgnorth) sends the following:—

℞. Ess. Bergamotte ʒij
„ Ambragris ʒiij
Ol. Neroli ʒiij
Acid. Acet. Fort. ℥ij
Ess. Vanillæ ʒiiss
„ Zingib. (℥j to ℥iij of Proof Spirit) ℥iij
S. V. R. ℥xxxvj.

[76.]—GLYCERINE JELLY.—*T. M.* (Worksop) is informed that neither isinglass nor tragacanth will make so bright a jelly as the gelatine such as is used for culinary purposes; this, in sufficient quantity to just gelatinize a mixture of 1 pint glycerine and 2 pints aq. rosæ, will furnish an article in every way satisfactory; a drop or two of otto of rose improves it, and it may be coloured (if desired) with liq. cocci or any of the beautiful colours now produced from aniline.—A. E. T.

[77.]—DISPENSING (“*Exhibatur*”).—With 2 ounces of distilled water mix the acid. phosph. dil., and in a separate vessel with the same quantity of water, mix the spt. chloroformi; let stand a few minutes, then mix the liquids: dissolve the ferri et quiniæ citras in the remaining water, pour the mixed liquid on the solution; lastly add tinct. nucis vom. and the mixture will remain bright.—S. HARWOOD, *Stoke Newington.*

[78.]—COMPOSITION FOR CLEANING BRASS.—

℞. Rottenstone ℥viij
Acid. Sulph. ℥ij
Ol. Olivæ Sec.,
Aquæ, ana ℥iss.

M. S. A. TOLU.

[79.]—PASTILE PAPER.—If *G. H. B.* will try the following, he will find it answer:—

Olibanum ʒxij
Styrax ʒviij
Benzoin ʒvj
Peruvian Balsam ʒiv
Tolu Balsam ʒiij
S. V. R. ℥x.

Macerate for twenty-eight days with occasional agitation, and add—

Saturated Solution Potassium Nitrate ℥j.

Soak the paper in it and dry.—SIGMA.

[82.]—BLUE COLOUR.—

Cupri Sulph. ℥j
Liq. Ammon. F. ℥iv
Aquæ Cong.

—F. G. HOLMES, *Brill.*

Similar answer has been received from “*Pestle and Mortar*” (Dorking), *T. W. C.* (Holbeach).

[84.]—PEPPERMINT CORDIAL.—

℞. Ol. Menth. Pip. Ang. ʒiss
Spt. V. R. Oiv (o. m.)
Sacchar. Alb. Hv
Aquæ Hvj
Magnes. Carb. ʒij

M. S. A. TOLU.

[86.]—PICK ME UP.—

Cardamoms 5 parts
Carraways 2 parts
Cochineal 2 parts
Cinnamon 10 parts
Raisins 80 parts
Orange Peel 56 parts
Ginger 14 parts
Gentian Root 3 parts
Wormwood 2 parts
Quassia 1 part
Alcohol (·838) 750 parts
Water 750 parts.

Macerate for fourteen days. Filter. Add Syrup 200 parts.

[87.]—GUM COWRIE is one of those commercial misnomers so common in City circles among brokers and importers. It is not a gum at all, but a fossil resin, used for varnish-making, obtained from New Zealand, being the produce of *Dammara australis.* In New Zealand it is usually written kauri. Full details and statistics respecting this product will be found in a paper I read on the gums and resins of commerce before the Society of Arts some years ago. (See this Journal, and in a paper on the gums and resins of New Zealand in my ‘Technologist,’ vol. vi. p. 475, 1866.)—P. L. SIMMONDS.

[88.]—EFFECT OF AMMONIA UPON BREAD.—Can any of your readers inform me why bread should turn yellow when exposed to the fumes of ammonia? Some time ago I was having my tea in a room in which the boy was breaking up a cwt. cask of ammonia, and, to my great astonishment, I found it turn the bread quite yellow.—A. T. GIRDLER.

[89.]—SYRUP OF PHOSPHATE OF IRON.—*W. M. B.* wishes to know the difference between Parrish's syr. ferri phosph. and the syr. ferri phosph. B.P.

[*** Parrish's is doubtless intended for the syr. ferri phosph. co., or chemical food.—ED. PH. J.]

[90.]—ARTIFICIAL MANURES.—*W. T. Oldham* (Wisbeach) wishes to be told of a good work on the manufacture and analysis of artificial manures.

[91.]—MEDICINE BASKETS.—*D. O. J.* wishes to know where he can obtain an improvement on the two-lidded square basket generally used for carrying out medicine, which will be light, durable and waterproof.

[92.]—VARNISH.—“*Sigma*” would be glad of a receipt for a flexible varnish to cover india-rubber tubing to prevent the escape of gas.

[93.]—OVER-PROOF SPIRIT.—Will your readers oblige a student with a clear definition of what is meant by spirit at a given strength over proof?—say 56 or 60 degrees over proof.—JUVENIS.

[94.]—OIL OF YLANG-YLANG.—I have frequently seen the oil of ylang-ylang quoted upon the price-currents of London houses. Can any of your readers engaged in the manufacture of perfume inform me if such is a genuine product, as stated, of one of the *Orchidaceæ*, or is it merely a mixture of other essential oils?—A COUNTRY DRUGGIST.

[95.]—COVERING FOR PILLS.—*F. R. B.* asks for the best mode of applying the solution of tolu for covering pills.

[*** Pour a small quantity of strong solution of balsam of tolu into a plate, and roll the pills in it.—ED. PH. J.]

[96.]—AERATED POTASS WATER.—In making aerated potass water according to the B.P., I find that when the bottles are laid by for a couple of weeks, a black deposit is formed on the cork. Can any one explain or give me a remedy for this?—SODA-WATER.

[97.]—OZONIZED ETHER.—*X. Q. Z.* wishes to be informed what is the nature of this preparation.

[98.]—DISPENSING.—*J. B.* (Stamford) asks for the best method of preparing the following prescription:—

℞. Quin. Disulph. gr. xij
Magnes. Sulph. ʒij
Alum. Sulph. ℈ij
Acid. Sulph. Arom. ʒij
Tr. Ergotæ ʒj
Inf. Caryoph. ad ℥viij

M. Capt. ℥j ter die.

It has always presented a dirty appearance.

Correspondence.

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

The Storage of Poisons Question.

Sir,—The importance of the subject will, I trust, be a sufficient excuse for troubling your readers with a few observations upon it. I have not yet heard the result of the discussion which took place at the meeting of the Council on the 7th instant, I am therefore unacquainted with the latest expression of its opinion. I am hopeful that the Council will be inclined merely to recommend with all the influence of its authority some well-considered plan for the voluntary adoption of the trade. The enforcement of regulations for the storing of poisons by the hand of the law, will not, I am sure, be tolerated; and the necessity for any legal interference, I and the majority have yet to discover. It is said that Government, through the Privy Council, has been or is putting the pressure upon the Pharmaceutical Council, and that the proposed legal interference, if the trade permit it, will be introduced, not because it is imperative to ensure the safety of the public, but mainly as a result of the bidding of the powers that be. If such pressure really exists, I hope the Council will wisely and manfully stand against it, rather than fetter the trade with vexatious restrictions. If the Council be the willing servants of the State, and are disposed to yield, I have little doubt but that the trade will put itself into a firm attitude of defence, to prevent the bartering of our trade liberty. The educational test now required, along with the caution and care resulting from an ever-present prudent self-interest, to say nothing of the penalties of judicial action under Lord Campbell's Act, are enough to ensure the safety of the public. If Government, however, is so very anxious to experiment in the direction proposed, let it bring in a measure to institute certain regulations in the surgeries of medical men, where the greater part of the dispensing of medicines is done, and where the usual safeguards are not always present. I do not say that this is at all necessary, but I do say that to attempt to saddle the chemist with restrictions, and let the medical man go free, would be a most insulting, foolish and unfair procedure. If the chemists of Great Britain permit themselves to be placed under obnoxious State surveillance and restraint in the mode of carrying on their business —for to institute regulations for the storing of poisons and not have them carried into effect, would be an absurdity—in the course of time some other new and spurious safeguard would be considered necessary. As for instance the inspection of chemical balances and scales used in dispensing, for the danger of using a wrong balance is almost as great as using the contents of a wrong bottle. Let us take warning and prevent the first wrong step, and the second will not be taken.

Robert Hampson.

Manchester, Dec. 13th, 1870.

Obscure Prescriptions.

Sir,—The correspondence in the Journal respecting "Obscure Prescriptions," brings to my mind what took place in my locality about thirty years ago.

A physician, at that time living near Blackfriars Bridge, used to give advice gratis, but compelled, as much as possible, all his patients to go to a certain chemist to have his prescriptions dispensed.

Particular marks were put upon the prescriptions by the privileged chemist every time he dispensed them, so that the physician might know whether they had been dispensed each time he saw them. He also took care that no one else could dispense them, by resorting to hieroglyphics.

This chemist after a time sold his business to another for a considerable sum, with the understanding that the physician's favours would be continued, but from some cause the physician shortly afterwards transferred them to a surgeon-retailer.

This provoked the chemist. He had circulars printed, which he sent very freely about the neighbourhood, stating that he was induced to purchase the business by the hope of having the physician's favours, that he had had to give the physician two pounds or guineas per week for the patronage, and that the physician called regularly every Saturday and never left without the money.

London, December 12th, 1870. Thos. Kent.

Druggists' Charges.

Doctor Kidd regrets that he gave a moment's annoyance to Mr. Ramsden, but he did not make any the remotest allusion to Mr. Ramsden. Grosvenor Square was given chiefly as showing that the "cutting down" system is unhappily common to this as well as other parts of London, though in such rich districts there could not be much excuse for it.

Sir,—Mr. Pollard, of Wavertree, has published a letter in this day's Journal, stating that a customer of his has had three dozen pills dispensed, at a first-class chemist's at Wolverhampton, for 8*d*. Will you allow me to tell him that he must have been the victim of a falsehood.

I do not know Mr. Pollard, but should fancy he has had little experience in such cases, or he would be very well aware that it is a very common practice with some people to have a prescription dispensed, and then, in order to get a reduction in the price, will say that they can get it for so much less at some distant town. I never believe them, for, some years ago, I took the trouble to ascertain the truth of some of these statements, when I always found I had been misinformed.

There is no doubt that some chemists are cutting the dispensing trade very much; still, it does not do to believe every exaggerated case that a strange customer will tell you. Mr. Pollard should have asked his customer the chemist's name, and should then have written to ascertain the truth of it before he published his letter in the Journal.

W. Y. Brevitt, *Local Secretary.*

Wolverhampton, December 10th, 1870.

Sir,—I have read with great interest the various letters which have lately appeared relative to the very low prices charged by some chemists, and I have often thought what a great desideratum would be conferred upon our profession, could all in a town agree to have one tariff. The other day I had a prescription brought to my shop to be compounded,—it was for an eight-ounce mixture, contained eight ingredients, including one ounce of tinct. aurantii, and an extraordinary large quantity of bismuth. trisnit. I thought no respectable chemist would charge less than 1*s*. 6*d*., which amount I asked for its being faithfully dispensed; but this morning, Sir, I had the gratification of being informed that it had since been made up in this town by a *Pharmaceutical* Chemist and a twenty years' member of our Society, and his charge was 1*s*. 2*d*., and also that the said Pharmaceutical Chemist unblushingly sells 1*s*. 1½*d*. patents for 11*d*., and charges 5*s*. for Mrs. Allen's Hair Restorer. Now, Sir, can we consistently complain of the "cutting" prices charged by those chemists who have never been educated to the profession, who have either been doctors' boys or dispensers at hospitals, when such things as these are done by an old member of our Society? I deeply regret to see it, being a reflection on that Society whose object and aim is the advance of pharmacy.

"Consistency."

Sir,—The following advertisement appeared in one of the leading Bristol daily papers:—

DRUGGISTS AND THEIR CHARGES.—Look at the Extract from the *Lancet*, copied into the Local Papers —one man charges 4*s*. for a 6-ounce Bottle of Medicine, another 1*s*. 6*d*. for the same. I charge, on an average, only 9*d*. Can it be possible that the Public will still submit to such an enormous imposition?—H. Hodder, 11, *Broad St., Bristol.*

It surely behoves us to urge on the Society at Bloomsbury Square to lay down a list of prices, whereby we may all keep as near the standard as possible without laying ourselves open to be insulted by such "black sheep" as the above.

Bristol. "Live and Let Live."

Sir,—As the profits on medicine have been so freely discussed in the pages of our Journal, owing to some remarks made in the *Lancet* respecting our charges, perhaps the following may not be out of place, to show that our profits are not so enormous as are generally considered by those who only speak from hearsay, and not from experience.

I have known the drug business just thirty years, yet I cannot give you an instance of a man retiring on a competency realized out of a retail drug trade, although he may have stuck behind the counter from 8 A.M. to 10 P.M., and scarcely taken a day's pleasure from year's end to year's end. In a town in which I resided a great many years, I could see from my door three druggists whose returns varied from £800 to £2000 per annum; being on friendly terms, we knew each other's business to a certain extent. One had married well, which rendered him to some extent independent of his business; another was a bachelor, and had a good income independent of his business; the third died suddenly, leaving a wife and family; he had the best business of the four, keeping two assistants and one apprentice; yet when the estate was wound up and all debts paid, there was a very small balance left. Now these men were many years my senior, and had been in business for upwards of twenty years, during which time neither could save £500. Though my returns were about £800 per annum from a general drug trade in a large country town, my profits did not average more than £200 per annum; what could I save out of that after paying the expenses for carrying on the business, rent, taxes, housekeeping and bringing up a family? Had it not been for an additional income, live as economically as I could, I should only have been barely able to pay my way.

Thirty years since, when provisions were much cheaper than they are now, we charged for Oss and ℥vj mixtures, 2*s.* 6*d.*; draughts, 9*s.* per dozen (we never get a prescription now for a dozen draughts; Seidlitz powders, 2*s.* 6*d.* per box; single ones, 3*d.* Compare this with the present prices, especially a Seidlitz powder retailed for 1*d.*, at a shop not a mile from St. Paul's. I wonder if Mr. — pays his rent with the profits accruing from the enormous quantity he must sell? I think these facts prove that the present profits attached to the retail drug business are not a sufficient remuneration for the time, labour and capital employed, to say nothing about the responsibility we take on ourselves, viz. the dispensing of illegible prescriptions, without having a licence to kill.

December 8th, 1870. "A RETAILER."

SIR,—There have been several inquiries in your columns for a list of "dispensing charges," and as the one adopted by the Manchester Chemists' Association is pretty generally followed in a tolerably extensive district, I beg to forward you a copy for publication, as one that may be considered fairly remunerative without being excessive, and may give an idea of what is practicable in a neighbourhood where chemists have some little confidence in each other. The use of the "price mark" is strongly recommended in all cases, as in the event of a prescription being taken to another shop, the second dispenser at once sees the price already charged, and consequently is able to obtain the same without being afraid, on the one hand, of charging more than his neighbour, or, on the other, of underselling him.

If the price mark "Mel Boracis," which has long been used in Edinburgh, and more recently in several other places, were universally adopted throughout the country as the mark for dispensing charges, it would be a great advantage, for then a prescription dispensed in various parts of the country could always be charged at the same rate, and a nearer approach to uniformity might thus be obtained.

W. WILKINSON.

Cheetham Hill, December 13th, 1870.

List of Dispensing Charges, adopted by the Manchester Chemists' and Druggists' Association, and recommended to the Trade generally.

Pills.*		Powders.	Mixtures.† Doses.	1 oz.	½ oz.	1 or 2 drms.	Lotions, Gargles and Injections.	Liniments.
				s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*
1		6*d.* to 1*s.*	oz.		1 0	1 0	1 0	1 0
2			½ ,,		1 0	1 0		
4			2 ,,	1 0	1 0	1 2		1 4
6	6*d.* to 1*s.*	1*s.* 0*d.*	3 ,,	1 0	1 2	1 4		1 8
8		1*s.* 4*d.*	4 ,,	1 2	1 4	1 6	1 2	2 2
10		12 and upwards	6 ,,	1 6	1 9	2 0	1 4	2 8
12		1*s.* 6*d.* to 2*s.* doz.	8 ,,	1 8	2 0	2 6	1 6	3 6
			10 ,,	2 0	2 6		2 0	
14	1*s.* 3*d.*	Powders for	12 ,,	2 6	3 0			
16		Effervescing	16 ,,	3 0	3 6		2 3	Lin. aconiti, 1*s.* . per oz.
18		Mixtures, 1*s.* doz.	20 ,,	3 6	4 0			,, belladonnæ, 1*s.* ,,
20	1*s.* 6*d.*	———						,, chloroformi, 1*s.* ,,
24		*Lotion Powders.*						,, crotonis, 1*s.* ,,
30	1*s.* 9*d.*	one, 6*d.* to 1*s.*						,, potassii iodidi
36	2*s.* 0*d.*	six, 2*s.*						cum sapone, 8*d.* ,,
48	2*s.* 6*d.*	twelve, 3*s.* 6*d.*						,, sinapis co., 1*s.* 6*d.* ,,
72	6*d.* per doz. and upwards.	3*s.* doz. for more.						

Drops.‡			Ointments, Electuaries, and Confections.	Draughts.		Suppositories.		Pessaries and Bougies.		
			s. d.		*s. d.*				*s. d.*	
¼ oz.		Stoppered bottles charged extra.		1	1 0	1	6*d.*	1		
½ ,,	1 0		1 0	2	1 9	2	to *s.*	2	1·0	*Price Mark* MEL BORACIS. 1 2 3 4 5 6 7 8 9 10 To be used thus—"m/e," 1*s.* 8*d.*, under the stamp of the first Dispenser.
1 ,,				3	2 6	4	1*s.* 0*d.*	3		
1½ ,,	1 6			4	3 0	6	1*s.* 9*d.*	4	1 6	
2 ,,	1 9		1 6	5	3 6	12	3*s.* 0*d.*	5		
3 ,,	2 6		2 3	6	4 0			6	2 0	
4 ,,	3 0		3 0					12	4 0	

* Scale of Prices for Pills.—The higher charge to be made when one, two, or more pills are ordered alone; if with mixture, etc., in the same prescription, the lower charge to be made.

† Mixtures, etc.—Quinine or other costly ingredients, or an extra large quantity of tincture, to be subject to a higher charge.

‡ "Drops," including concentrated medicines or tinctures. Ordinary bottles and pots are included in the above prices. The uniform adoption of the price mark will prove advantageous, as showing to subsequent dispensers the charge already made; when charged below the above rates, a mark × in the upper left-hand corner will denote exceptional.

Chloral in Sea Sickness.

Sir,—I have taken chloral five times while crossing the Irish Channel, with very good results.

My first experiment was made last March, when 50 grains took me from Kingstown to Holyhead as sound as a top. On returning a few days later, I tried 60 grains; and though it was very stormy I was as unconscious of winds and waves as an unborn babe, not waking till shaken by the steward at the Kingstown pier. My travelling companions, who had had five hours of misery, said they would have given ten shillings each for such a magic draught.

On crossing from Cork to Liverpool to attend the Pharmaceutical Conference, I took two 50 gr. doses, and slept the whole way, about twenty hours.

I would propose the following directions, a departure from which may lead to bad results:—

If a smooth passage is expected take nothing, but enjoy yourself.

If sea-sickness is feared, take a good dose about half an hour before its occurrence is expected; keep warm, go to bed, and you will sleep.

If the dose is delayed until nausea is felt, the stomach will instantly reject the chloral, and the remedy will be unsuccessful.

At this eleventh hour I would suggest the following, though I have never tried it. Take a few inhalations of chloroform, and when partially insensible, take the chloral, which would then, I think, be retained until sleep ensued.

J. Hancock Richardson.

3, Arundel Terrace, Cork.

Sir,—Allow me to endorse the correctness of your opinion, as stated in the Pharmaceutical Journal of the 3rd inst. in reference to the addition of acid. sulph. dil. in dispensing the formula as given by "Magnesia," No. 22, p. 437, and also as a consequence to protest against the contrary view put forward by "Chemicus" in to-day's issue. "Chemicus" does not seem to be aware that medical men do frequently prescribe intentionally quiniæ sulph., without the customary addition of acid. sulph. dil. An eminent provincial surgeon once informed me that he did so because his patients experienced considerably less nausea when so given. I should trust no pharmaceutist would, on reflection, consent to such an infringement of a medical man's prescription as that suggested by "Chemicus."

A Major Associate.

Tunbridge Wells, Dec. 10th, 1870.

A Point of Ethics.

Sir,—In your last week's issue, a letter appeared, signed by "Chemicus of Twenty Years' Standing," stating that when quinine is ordered in a mixture, and no "acid" prescribed with it, a chemist would be justified in adding acid. sulph. dil. in order to dissolve it. On this point I must differ from him.

Many medical men omit the "acid" because their patients dislike the intense bitterness of the quinine; and "Chemicus" ought to be aware of the fact, that quinine is *not* so bitter when undissolved as it is when in a dissolved state. Surely the members of the medical profession are not so forgetful as "Chemicus" would like to make out.

On the other hand, if there be no "acid" prescribed in a quinine mixture, but the words "solve" or "misce secundum artem" added, then a chemist would understand that it was the prescriber's intention that the quinine should be dissolved.

Bath, December 13th, 1870. D. T. W.

Irish Pharmacy Bill.

Sir,—I send you a few suggestions regarding the proposed Pharmacy Bill for Ireland.

Instead of the present Bill, let a Bill be framed by the Pharmaceutical Society, extending the English and Scotch Pharmacy Act to Ireland, but so modified as to leave out all its objectionable features, and so help to assimilate, as far as practicable, the laws of the three kingdoms, instead of having them administered by two separate bodies.

In introducing a Bill for the extension of the Act to Ireland, I would suggest the following modifications of that for England and Scotland.

1st. That no one be permitted to take apprentices until they have passed the Preliminary Examination.

2nd. That no person be permitted to be employed as an assistant who has not passed the Minor Examination.

3rd. That no person be permitted to keep open shop for the dispensing of physicians' prescriptions until they have passed the Major Examination.

Let it be further arranged that apothecaries be permitted to keep open shop in England and Scotland for the dispensing of physicians' prescriptions, and that Pharmaceutical Chemists be permitted to keep open shop in Ireland for the same purpose, but those by examination only. In this way the flock of Registered Assistants who have passed the Modified only, those who have passed the Minor only, and Registered Chemists and Druggists will be excluded.

I would suggest that the Chemists and Druggists in Ireland be excluded also, as they are a comparatively uneducated body (*i.e.* with regard to special education), and have never possessed any privileges for the dispensing of prescriptions.

William M. M'Naughton.

Dublin, 7th December, 1870.

"*Veritas*" (Ealing) and *C. B.* (Sheffield) are referred to the rule respecting anonymous communications.

C. B. L. (Towcester).—The 'Food Journal' is published by Messrs. Johnson and Sons, Castle Street, Holborn, price 6*d*.

M. P. S. (Birmingham) should apply to the Secretaries of the Chemical Society, Vernon Harcourt, Esq., and W. H. Perkins, Esq. See Answers to Correspondents, "*G. A.*" *ante*, p. 180.

J. B. (Frodsham).—It is used principally in the manufacture of gas burners.

W. A. Twelvetrees.—Nitro-Benzol is produced on a large scale by the addition to benzol of nitric acid or a mixture of nitric and sulphuric acids in a small stream, so regulated as to prevent too great an increase in the temperature. For a detailed account of the process, see Perkins's 'Cantor Lectures on Aniline,' Reimann's 'Aniline and its Derivatives' (Longmans), or any standard work on dyes.

H. (Salisbury).—The 'Homeopathic Pharmacopœia' is published by the British Homœopathic Society, and may be obtained of Messrs. Turner, Fleet Street, or any wholesale homœopathic agent, price 10*s*. 6*d*.

"*Justice.*"—In consequence of the writer not furnishing his name and address, we are unable to publish the letter with the above signature, containing a card said to have been left at the door of a medical man in Islington.

W. G. (Swansea).—The opinion of pharmacists is undoubtedly in favour of Fownes' Manual.

J. T. Freeman (Great Hadham).—The letter has been forwarded to the publishers.

J. Hands (Campden) and *J. Parry* (Chester).—The memorandum and stamps have been handed to the Secretary.

Ferri Quinæ Citr., B.P.—A manufacturer informs us that although he can obtain eight grains of quinia from fifty grains by precipitation with ammonia (the precipitate being dried at 212° F.), from small, hard scales, such as druggists would *not* use, he cannot obtain more than 7·6 grains from the large scales so esteemed for dispensing. He therefore thinks the Pharmacopœia should give 15 per cent. of quinia as the minimum quantity recognized.

J. Otley (Sheffield).—The certificate of having passed the preliminary examination of the Royal College of Surgeons would be accepted.

G. J. Rawland (Liverpool).—A letter has been received too late for insertion, in consequence of its having been wrongly sent to the publishers.

Erratum.—In the article on Sp. Ætheris Nitrosi, p. 464, line 5 from top, *for* 56 per cent. *read* 56 o. p.

Communications, Letters, etc., have been received from Mr. Walker (Maidenhead), Mr. R.W. Giles (Clifton), Messrs. A. and M. Zimmermann, Mr. J. H. Brown (Bolton), Mr. F. B. Benger (Manchester), Mr. Allen (Clifton), Mr. D. Hanbury, Mr. A. Barron (Aberdeen), Dr. J. De Vrij, Mr. J. E. Howard, Mr. I. Bourdas, Mr. A. H. Mason (Liverpool), Mr. E. G. T. Agnew (Guernsey), Mr. Frank Adams (Stoke-on-Trent), Mr. J. Baynes (Stamford), Mr. G. B. Clarke (Woburn), Messrs. Matyard and Sap (Basingstoke), Mr. H. P. Hearder (Plymouth), Mr. Hornecastle (Sheffield), H. H. H., W. G. (Swansea), G. A. (Brighton), T. N. (Glastonbury), F. C., Lucidus, H. B. (Scarborough), P. O., Mr. Pendennis (Redruth), "Alpha," W. J. P. (Hawkhurst), "A Leech," S. N. (Dorchester), "Student."

PRACTICAL NOTES
ON THE
PREPARATIONS OF THE BRITISH PHARMACOPŒIA.

BY CHARLES R. C. TICHBORNE, F.C.S., M.R.I.A.
Chemist to the Apothecaries' Hall of Ireland, etc.

Acetum Cantharidis and the Vesicating Preparations of Cantharides.

The vinegar of cantharides calls for very few remarks. If made strictly according to the Pharmacopœia the result is a very pungent liquid, having a brown colour. The specific gravity at 15° C. will range from 1·060 to 1·062. It should be miscible with water in all proportions. The heat employed in the maceration is, as will be seen, conducive to the solution of cantharidine (*vide* remarks upon the solubility of cantharidine).

Taking the formula of the Pharmacopœia, 12 fluid ounces are got by percolation, and 3¼ ounces by pressure, so that 2 ounces of glacial and 22¾ ounces of acetic acid are consumed. It directs that powdered cantharides should be used, but it will be found more convenient that the flies should be simply bruised, particularly when making large quantities. The substance of the flies is easily permeated by the acid, whilst the structure generally gets into such a pulpy state from its action, that it is difficult to manipulate with large quantities of powder.

In the Pharmacopœia no characteristics or tests are given for what used to be called the "preparations" in the edition published in 1864. These preparations are in the majority of cases more easily sophisticated than the materia medica, and are frequently the vent for inferior drugs. The point is worth consideration, and any specific or general character which can be applied to them must be of importance. It is for this reason that I have given the specific gravity.

The relative strength of the present preparation to those formerly in use is given:—

	Total Crystallizable Acid.	Glacial Acid, etc. (sp. gr. 1·065).	Acetic Acid. (sp. gr. 1·044).	Cantharides.
	Per cent.	Per cent.	Per cent.	Per cent.
B.P.	39·7	10	90	10
L.P.	37·0		100	10
Ed. P.	43·75	25	75	17·5
			(Sp. gr. 1·034.)	(Euphorbium 2·5 per cent.)
Dub. P.	46·4	20	80	20

The Pharmacopœia has the following note in connection with the strength of these preparations:—"This preparation is rather stronger than the acetum cantharidis of the London Pharmacopœia; it is less active than the preparations ordered under the same name in the Edinburgh and Dublin Pharmacopœias;" in fact, as will be seen in the first and fourth columns, these two preparations are almost identical. The percentage of flies could be increased with great advantage.

Liquor Epispasticus.—It is, perhaps, as well to consider the remainder of the vesicating preparations of cantharides in this place. The first of these is the liquor epispasticus; this term having been substituted for the "linimentum cantharidis" of 1864. In the present formula for liquor epispasticus, there is evidently a mistake. Based upon a valuable idea, it is obvious that the wrong acid has been specified. The following is the formula:—

Take of
Cantharides, in powder, 8 ounces
Acetic Acid, 4 fluid ounces
Ether, a sufficiency.

"Mix the cantharides and acetic acid, pack them in a percolator, and, at the expiration of twenty-four hours, pour ether over the contents of the percolator, and allow it to pass slowly through till twenty fluid ounces are obtained."

The acid directed in the above formula is the ordinary acetic acid, having a specific gravity of 1·044. Now, independently of the want of solubility of cantharidine in cold acid of that gravity (*vide* remarks on solubility of cantharidine, p. 502), two parts of acetic acid are not miscible with fourteen parts of ether of the gravity required by the Pharmacopœia. (These are the proportions that would be used.) If we mix them in the above proportions we get a product presenting two layers; the lower one consists almost entirely of water, and is about one-half the bulk of the original acid employed; whilst the upper is ether, holding in solution about $\frac{1}{15}$ of a stronger acid than that originally used; however, these fluids act rather differently when employed for the exhaustion of the cantharides. Obeying strictly the Pharmacopœia, we find that on passing the ether through the powdered flies, the ether extracts the green oil and other ingredients of the cantharides, the latter retaining the greater part of the water present in the acetic acid. The result is an ethereal tincture saturated with water, and having a specific gravity of about ·770 at 15° C. About 14 ounces of ether are consumed to produce the half-pint of liniment. If the residue is squeezed a considerable quantity of water is the result, and on drying in the air until the whole of the ether has evaporated, the flies will be found to weigh nearly one quarter more from the water absorbed, instead of being lighter from the loss of extractive. A process of separation seems instituted by which the aqueous portion is retained by virtue of the attraction of the animal matter.

It is evident that glacial acetic acid should be used; if this is done, a rapidly vesicating and homogeneous fluid is obtained. The following is the alteration that we venture to suggest:—

Take of
Cantharides in powder 8 ounces.
Glacial Acetic Acid . 2 fluid ounces.
Ether . . . . 28 ounces, or a sufficiency.

Rub the cantharides in a mortar with the glacial acetic acid, and proceed as directed in the Pharmacopœia. The consumption of ether will be found to be about the same as in the previously mentioned formula, namely 28 ounces, the specific gravity at 15° C. being ·779; in this instance the cantharides will be found to have lost considerably in weight, for on exposure to the air for a short time until the ether had evaporated, they were found to weigh only 7 ounces.

A formula for vesicating collodion might at the same time be introduced, that preparation being more extensively used than the vinegar or liniment. The collodion is a great favourite with the ophthalmic surgeons; it is easily made in the following manner:—

Take of—
Blistering Liquid, 10 fluid ounces.
(not made with ordinary acetic acid.)
Gun Cotton, ¼ of an ounce or a sufficiency.

Mix, and shake them occasionally until dissolved, and add more gun cotton if not thick enough. This, in fact, resolves itself into the formula published by the author in 1862.*

Before considering the vesicating preparation further, it may not be uninteresting to give the solubility of cantharidine in different solvents, bearing in mind the fact that such results were obtained with the crystallized active principle, and that in the fly it may be, and probably is, considerably modified by the other ingredients.

Action of Solvents upon Cantharidine.

Water.—Insoluble.

Alcohol, Ethylic and Methylic.†—Fairly soluble in hot fluids, very insoluble in the cold.

Acetic Ether.†—Soluble.

Ether.†—Soluble in 34 parts.

Chloroform.—Very soluble in the cold. (As stated by Proctor, seems the best solvent.)

Bisulphide of Carbon.—Nearly insoluble.

Volatile oils.—Mostly solvents.

Castor and fixed oils.—Very soluble.

Fatty matter of the Fly.—Very soluble.

Sulphuric Acid.†—Soluble. Reprecipitated by water.

Glacial Acetic Acid.—Slowly dissolved in the cold, very soluble in warm acid. A saturated solution in glacial acid is reprecipitated by water.

Acetic Acid 1·044.—Scarcely soluble. Dissolves by prolonged boiling and crystallizes out on cooling.

Weak Soda, or Potash Solutions.—Nearly insoluble.

Strong Potash, or Soda.—Dissolves easily on warming and is not precipitated on diluting, but is precipitated on the addition of acids.

Ammonia.—It is stated in Watts's 'Dictionary,' vol. i. p. 736, that "ammonia has no action upon cantharidine." This statement is incorrect. Weak ammonia has no action upon it, but very strong liquor ammoniæ dissolves it easily after some time, particularly if it is warmed, without a loss of the ammonia.

The two last paragraphs might be made available for the concoction of good formulæ, whilst the reactions observed with the acetic acids bear upon the preparations we have been discussing.

* *Vide* PHARMACEUTICAL JOURNAL, 2nd ser., Vol. III. p. 506.

† The reactions are taken from these published observations of others, and not from the author's experience.

KALI-KUTKI.

(*Picrorhiza kurroa*).

BY M. C. COOKE, M.A.

For a very long time the Kali-kutki of Northern India was believed to be the black Hellebore, and under that name it has been quoted, over and over again, by one author after another, until it came to be accepted as fact. It is some years since we first became acquainted with this drug, and from that period have always maintained that it could not be the root of black Hellebore. It is probable that the error was originated by Ainslie, since he makes the statement in his 'Materia Medica;' but upon what evidence the assertion was first made it is scarcely possible now to determine. Enough for us that Kali-kutki is *not* the root of black Hellebore.

The authors of the Indian Pharmacopœia seem to have been of opinion that there were two distinct drugs known in India, the Kootki of Northern India, and the Kali-kutki of the bazaars of the South. In the Supplement to the Pharmacopœia of India, Mr. Moodeen Sheriff has disposed of this opinion in a few words, for he states that "the root sold in the bazaars of Calcutta, Hyderabad and Bombay, under the name of Kutki is identical with the Kali-kutki and Katuku-rogani, or "Kada-groganie" of Southern India. If the quantity is large, it varies much in size and appearance in each specimen, but the essential characters are invariably the same."

The Kootki of the Indian Pharmacopœia was there referred to *Picrorhiza kurroa* of Royle;* and this is confirmed in the Supplement by Mr. M. Sheriff, who affirms his belief that it is correctly assigned. There is no doubt that this determination may be relied upon as accurate.

The description which is given of the *Picrorhiza kurroa* is as follows:—(Nat. Ord. *Scrophulariaceæ.*) Root thick. Stem very short. Leaves sub-radical oblong, serrato-crenate, narrowed at the base into the short petiole, slightly rugose, smooth, or with a few scattered hairs. Peduncles scapiform, many-flowered, aphyllous, or with a few small bracts. Flowers sessile, in a dense spike, bracts lanceolate. Calyces with a glandular pubescence 2–2½ lines long, segments lanceolate, acute, subequal. Corolla shorter than the calyx, four-cleft to the middle. Stamens three times the length of the corolla. Capsules six lines long, acuminate, acute. Testa of the seed twice as long as the seed itself.

To this description we may add that portions of dried plants from time to time, picked out from samples of the Kutki, corresponded in the following particulars, although neither flower nor fruit has yet been found under those circumstances:—"Stem from 2 to 4 inches long; about the thickness of a large goose-quill; curved or bent; rough from many thin circular or semicircular scales; reddish-brown externally and black internally; very bitter in taste, occasionally divided into two stems; generally terminates in 2 or 3 small branches, which are seldom longer than an inch; soft and swollen when soaked, which indicates its fleshy condition when fresh; leaves when moistened and opened, are obovate with a very long, narrow and tapering base, which looks in the dry state like a petiole, sessile, serrate, anguli-nerved and glabrous."† There can be no doubt of the identity, though this evidence is rather circumstantial and incomplete.

The native names which are given for this drug are as follows:—Kharbage hindi, Arabic and Persian; Kutki, Hindustani and Bengali; Kali-kutki, Dukhni; Katuku-rogana, Tamil; Katuka-rogani and Katuku-roni, Telugu; Katu-rohani, Sanskrit; and Kalu-rana, Cinghalese. Of course, the Kadagaroganie of the Pharmacopœia is only another mode of writing the Katuku-rogana of the Tamils.

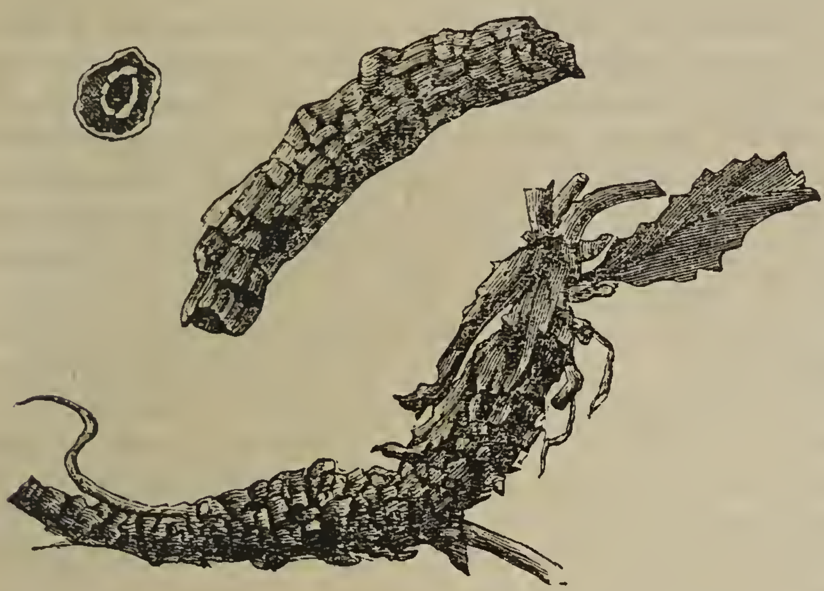
This drug, as we have usually seen it, was very much broken up, so that it consisted of fragments from an inch to two or three inches in length. Its

* Royle's 'Illustrations of the Botany of the Himalayas,' p. 291, plate lxxi.

† 'Supplement to the Pharmacopœia of India' (1869), p. 279.

more complete character can best be given in Mr. Moodeen Sheriff's own words:—

"Although this drug is commonly known as a root, it consists partly of the root and partly of the stem; therefore, if it is entire, the upper portion



(stem) differs from the lower (root) in external characters. The upper portion is about two or three inches long; very rough, from thin scales; brown or reddish-brown in colour if the scales are not worn out, but paler if they are so; in the latter condition it bears circular or semicircular marks of the scales, which occasionally make it look slightly annulated; varies in thickness from one to three goose-quills; beset with the remains of leaves; and often curved and sometimes bent upon itself. The lower portion is much thinner, varying in thickness from a quill of a fowl to that of a goose; paler in colour, being generally brownish-grey or brownish-white; nearly of the same length as the upper portion; more or less compressed; wrinkled longitudinally; and beset with elevated marks of rootlets. There is no difference between the colour and taste of the internal substance of both portions, which are black and extremely bitter, respectively. The root is generally cylindrical, but, from having the upper portion much thicker than the lower, it looks tapering sometimes. It is very light and brittle, and easily powdered." The deep black colour and short waxy fracture of the inner portion of the root are very characteristic features.

This is strictly an Indian drug. The localities given for the plant are Gossain Than, Kumaon and Kedarkonta. It has been said to occur also in some mountains near Chittoor, in Central Carnatic, but the Himalayan region is evidently the source of the bazaar drug, which goes down to Calcutta, and thence to Madras and probably to Bombay. Dr. Stewart says that it is common in the Punjab Himalaya, at from 5,500 to 14,000 feet. Honigberger declares that it is more frequently used in veterinary than in human medicine, but in the latter its root is one of the regular febrifuges. It must be used in considerable quantity, as the author of 'Punjab Plants' states that thirty-six maunds were exposed for sale from Kúllu at the Rampúr fair in Bissahir, in 1867. Davies' Trade Report gives twenty maunds of Kutki as annually exported from Peshawar to Kabul.*

The reputed purgative properties of this substance have no foundation in fact; its great use lies in its being a very valuable tonic, in which respect Assistant-Surgeon Moodeen Sheriff considers it equal to gentian and colomba, and superior to chiretta. As a dose, 10 to 20 grains as a tonic; or 20 to 40 as an antiperiodic, are recommended. If this is really a just appreciation of the value of this drug, it no longer deserves to be placed amongst the "non-officinal," but to rank with the officinal substances of the Indian Pharmacopœia. Further than this, if it has proved superior to chiretta in India, why should it not receive a fair trial, in competition with gentian, colomba and chiretta, in this country? Both this and the Atees root (*Aconitum heterophyllum*) deserve a full and fair trial, which neither of them have yet obtained.

* See Dr. J. L. Stewart's 'Punjab Plants,' p. 163. Lahore, 1869.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

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ARGENTI OXIDUM.—Solution of nitrate of silver is poured into lime-water, the latter being in very slight excess. The precipitated oxide is allowed to settle and washed with distilled water:—

$$CaO + 2AgNO_3 = Ca2NO_3 + Ag_2O.$$

Lime-water is preferred, in this case, to solution of potash or of soda. When these are used the oxide is apt to be mixed with small quantities of carbonate and chloride, and also retains traces of the alkali, which it is very difficult to remove by washing.

Oxide of silver is a very powerful agent of oxidation, yielding its oxygen so readily to many organic substances, particularly essential oils, as to give rise to active combustion. It is also decomposed by common salt and all chlorides, and by many other salts. In dispensing it, therefore, these facts ought to be borne in mind.

ARGENTUM PURIFICATUM.—Metallic silver, free from copper and from all but mere traces of other metals, is obtained by dissolving crude silver in nitric acid and precipitating the whole in the form of chloride by the addition of common salt. The precipitate separated from the solution is placed in a dish, wetted with dilute sulphuric acid, and a sheet of zinc laid upon it. In about twenty-four hours the decomposition is complete, the zinc is removed, and the residual sponge of metallic silver digested with dilute sulphuric acid and finally washed. If desired, it may then be melted into a mass.

[§ If ammonia be added in excess to a solution of the metal in nitric acid, the resulting fluid exhibits neither colour nor turbidity.] This test indicates freedom from copper and lead.

BISMUTHI CARBONAS.—Dissolve purified bismuth in slightly diluted nitric acid, and add this, in small quantities at a time, to a solution of carbonate of ammonia. Collect, wash, and dry the precipitate by a gentle heat.

On dissolving the bismuth in the nitric acid, the following reaction occurs:—

$$Bi_2 + 8HNO_3 = 2(Bi3NO_3) + N_2O_2 + 4H_2O.$$

And when the solution of this nitrate of bismuth is added to the carbonate of ammonia, brisk effervescence ensues from the escape of carbonic anhydride.

$$\underset{\text{Nitrate of Bismuth.}}{4\,[Bi\,3\,NO_3]} + \underset{\text{Ammon. Sesquicarb., B.P.}}{3\,[(NH_4)_4O_2(CO_2)_3]}$$
$$= \underset{\text{Nitrate of Ammonium.}}{12\,NH_4NO_3} + \underset{\text{Gas.}}{7\,CO_2} + \underset{\text{Carbonate of Bism., B.P.}}{2\,(BiO)_2CO_3}.$$

The formula of the carbonate of bismuth is best written as shown in the equation. The radicle BiO is univalent, for the same reasons as the analogous compound SbO. [See Antimon. Tart.] It forms a series of salts, by combining with acidulous radicles. They are more stable than the normal salts of bismuth.

	Salts of Bismuth.	Salts of Oxybismuthyl.	
Chloride .	$BiCl_3$	$(BiO)'Cl$	
Nitrate . .	$Bi\,3\,NO_3$	$(BiO)'NO_3$	B. P.
Carbonate .	$Bi_2\,3\,CO_3$	$(BiO)'_2CO_3$	B. P.
Oxide . .	Bi_2O_3 or	$(BiO)_2O$.	

Some of them, however, may be viewed as containing (HO) in union with the bismuth instead of O. The official nitrate would thus be a compound intermediate between the hydrate and the nitrate.

$$\underset{\text{Hydrate.}}{Bi\begin{cases}HO\\HO\\HO\end{cases}} \quad \underset{\text{B. P.}}{Bi\begin{cases}HO\\HO\\NO_3\end{cases}} \quad Bi\begin{cases}HO\\NO_3\\NO_3\end{cases} \quad \underset{\text{Nitrate.}}{Bi\begin{cases}NO_3\\NO_3\\NO_3\end{cases}}$$

(Intermediate Compounds: the second and third.)

Carbonate of bismuth is a white powder insoluble in water, but soluble with effervescence in nitric acid. The nitric acid solution, if it contain not too much free acid, will give a white precipitate of subnitrate (hydrate-nitrate) on being poured into water. This precipitation of the acid solution by water is almost characteristic of bismuth. Chloride of antimony, which acts in a similar manner, is distinguished by forming by sulphuretted hydrogen an orange-coloured precipitate; bismuth gives a black sulphide.

[§ The nitric acid solution of carbonate of bismuth gives no precipitate with diluted sulphuric acid nor with solution of nitrate of silver.] The former of these tests indicates the absence of carbonate of lead, the latter the absence of oxychloride of bismuth.

[§ Carbonate of bismuth added to sulphuric acid coloured with sulphate of indigo, the colour of the latter is not discharged.] Freedom from any appreciable quantity of nitrate is thus ensured.

Bismuthi Subnitras.—Purified bismuth is dissolved in nitric acid, the solution reduced by evaporation, and then poured into water. The precipitate which forms is washed once, drained, and dried by a very gentle heat. The nitrate formed by dissolving the bismuth in nitric acid is converted into hydrate-nitrate (see Bism. Carb.) by the action of the water; thus—

$$Bi\,3\,NO_3 + 2\,H_2O = Bi\,NO_3(HO)_2 + 2\,HNO_3.$$

A little nitrate of bismuth is retained in solution, and, if the washings are not preserved, is lost.

Subnitrate of bismuth is recognized as a bismuth salt by the reactions described in connection with the carbonate. It is also liable to the same impurities. In addition it has been found to be extensively adulterated with phosphate of lime. To detect this substance, dissolve a portion of the sample in dilute nitric acid; precipitate out the whole of the bismuth by a stream of sulphuretted hydrogen; filter the liquid, and heat it to expel excess of H_2S. Test a small portion for phosphoric acid, by adding a slight excess of molybdate of ammonium; a yellow precipitate will be formed. Test another portion for calcium, by neutralizing by ammonia, then adding acetic acid in excess, and lastly a soluble oxalate. A white precipitate of oxalate of calcium will be formed.

Bismuthum purificatum.—The process of purification recommended in the Pharmacopœia consists in fusing commercial bismuth with the addition of a small quantity of nitre. Besides being very wasteful of the bismuth, this method is inadequate to the removal of the whole of the impurities usually present. Arsenic and lead are oxidized and carried off in the scoria; but the greater part of the copper which exists in most samples, and the silver, when that metal is present, are left in the fused metal. Probably the only method by which pure bismuth can be obtained consists in dissolving the crude metal in nitric acid, precipitating by the addition of water, and washing the precipitate. This by ignition would be converted into the oxide, and the oxide into the metal, by heating it with charcoal.

Bismuth, considering it as a metal and not as a metalloid, is a very fusible substance. Its melting-point is a little over 500° F.; specific gravity 9·8.

PLANTS AS MANUFACTURERS.

(*Concluded from page* 487.)

Many of our manufacturers excel in the art of packing, but never were goods so well or so closely packed as the coal measures. Living plants are likewise most skilful in this line. All their products are done up in handy bundles for transportation or conveyance to the end of the earth. Fancy the trouble it would have been to us had wheat grains been the size of quartern loaves, peas like dumplings, or apples big as pumpkins!

The packages of plants are not only of the best size, but the wrappers are mostly air- or waterproof. We all know the importance of this with perishable articles. Hams, tongues, meats, and sweets can only be preserved in airproof packages. There is another singular peculiarity about the packing done by the plants. The entire plant is often stowed away within a single portion of it. Annuals are packed up within their tiny seeds, and bulbous plants within their bulbs. This is of immense importance for close stowage and safe distribution. This arrangement brings, as it were, the genial climes and bright suns of other countries to cheer and enliven this. What would many of our winter drawing-rooms and conservatories be without the sweetness and the beauty of good Dutch bulbs? These let loose before our admiring eyes all the grandeur and the fragrance born of John Dutchman's summer. In the same way Cape bulbs and orchids bring to us, ready for immediate use, the glories of the tropical sunlight and the warm tints painted by the heat of such climes.

Finally, plants are cleanly manufacturers. They make little or no dirt. They touch decomposition at all points, but it is to recompose it. They absorb foul odours, but they are no longer foul, they convert them into sweetness. No law is needed to make plants consume their own smoke. They make none. No stringent enactments need to be enforced about their chemical processes; they are inoffensive. No scavengers are required to gather up their rubbish,—they are their own scavengers. True, many of their working hands (the leaves) only live one year, and then seek a grave upon or within the earth. But these speedily disappear, and are, in fact, again taken into the factory to strengthen and enlarge it.

The penalty exacted from most great centres of manufacturing industry and commercial activity is an excess of filth in the air we breathe, the water we drink, and the earth we live on. It was recently stated that Liverpool invites any disease that may be in the air, and that its foundations are tainted with disease. The town is about the most dangerous to live in of any in England, the rate of mortality being alarmingly high. Doubtless the shipping, the tramps, the emigrants are all dangerous at times to health, and there seem to be other and special centres of contamination and pollution in the chemical works, and the immense numbers of bricks burnt in clamps round the suburbs. I think I never smelt so many or such curious odours as around Liverpool. It seems as if King Sulphur had been shaking himself up, and his fumes almost stifle the breath of strangers. Add to all these the inevitable pollutions arising from work, traffic, life combustion, respiration, decomposition, all fouling great towns to the utmost of their capacity. We ourselves die daily, and, were our eyes set to a finer vision, we should see portions of every one of us in the apparently pure air of a room.

Is it asked what all this has to do with the manufacturing power of plants? It has everything to do with it. Plants are the cleanliest of all manufacturers, but we have seen that they are also shoddy merchants. More, they are chiefly this, they deal in pollution, and it is only through plants that the great problem of the day—"What shall we do with our dirt?"—can be solved. There is no other mode of extinguishing dead matter but by its conversion into living substance, and plant manufacturers are alone equal to this stupendous undertaking. All other possible means have been tried and failed. We have sent our waste up into the air, and it has returned to us in fevers and pestilences. We have turned our streams of reeking sewage into rivers and seas until our great drinking cisterns have been poisoned at their sources. Then the more sensible cry arose, "To the land with your foul waste!" But the earth is tolerably full of graves already, and if we turn it into a great dry-earth closet or huge sewage-sponge, there is great danger that by-and-by it may revolve round the sun a fever-stricken world of pestilence and death. The antidote to pollution is living plants; these absorb, transform, utilize, and annihilate it. They weave these elements of disease and death up into the very staff of life. It may be said that such manufacturers do not thrive in towns. The few there are refuse to grow. The remedy for this is, more of them. Send 100 brave soldiers against 10,000, and no courage or skill can save them from destruction. It is just so in their case; pollutions abound in all directions, and you send out against them a few ragged hosts of weakly trees. The chief remedy for the alarming death-rate is more trees around the suburbs, all the open spaces in the centre of the city filled with sweet flowers. Fight fever with the sweet incense of lovely flowers, annihilate it with the absorbing force of fever-consuming leaves.

The balance of parties, or rather forces, in the atmosphere is in great danger of being upset. A tremendous run is made in these centres of life and hives of industry for oxygen. We neither live nor work without it. On the other hand, whole volumes of dead carbon and other pollutions are thrown into the atmosphere. An actual scarcity of the former, and an excess of the latter, means suffering or death to us all. How shall we rally to the defence of the atmospheric constitution? We have no choice of instruments, we have but one, but that is all-sufficient. Plants alone can drain the air of its excess of carbon, and return to it a pure stream of oxygen. Every leaf, stem, and flower is employed night and day in restoring the atmospheric balance to an equilibrium; and, upon the whole, they have done their work perfectly. Here and there, and over large towns, there are certain changes,—an excess of foreign matter, dust, etc. in the air; but, as a whole, its constituent parts are the same. To rectify these partial changes which are so fatal to health, we must plant more extensively. Girdle each city round with a wide band of grand trees and green parks. Sentinel the streets with officers (sanitary trees) at regular distances, in green or golden uniform, that will rest not from their labours day or night, nor leave for an instant their posts of danger and of duty; enwreathe the houses, homes, workshops, warehouses, mills and factories with garlands of leaves and flowers; crowd the house-tops, window-sills, yards and areas with objects of beauty and fragrance; let flowers wave down to us a joy from every giddy garret, and send up a symbol of trustful hope from every deep dank cellar, until they cover and gladden the earth as the "waters cover the channels of the sea."

Plants are the true patron saints of these hardworking utilitarian times. Their perfume is the best of all antidotes to all foul odours. Their life is a warfare with elements that would be death to us. They gladden, purify, and ennoble the highways and byways of life, providing for rich and poor, manufacturer and mill hand, prince and peasant alike, those grandest preservatives of health, a clean earth, pure air, and clear water. The ministrations of plants to man are constant. They never leave nor forsake us. They meet us on the threshold of life, they abide with us to the last. None are too poor to enjoy flowers, none so rich as to be able to dispense with them. Through plants we live, move, and have our being. They distil for us the breath of our life. They raise our water, they make our food. They provide our clothing, our medicine in sickness, our strength in manhood, our sweet interpreters in love, our solace in suffering, our transfigurators at death. Through the agency of plants the worlds of matter and of life are linked together, and the three kingdoms—the vegetable, the animal, and the mineral—are united in bonds closer than those of holy matrimony. They clothe the invisible air, and the wondrous light, heat, chemical force, and energia of the sun with bodies of marvellous symmetry, beauty, sweetness, and glory. The Poet Laureate has said or sung that "Nature slopes through darkness up to God." As we try reverently to look through the mist that hides the life and the work of plants from our eyes the veil of darkness is partially rent asunder, and we exclaim, as we catch a glimpse of the wisdom that plans, the goodness that guides, and the power that governs all, that Nature is, in deed and in truth, the outer fringe of the glorious garment of God.

ON THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Continued from page* 486.)

Behaviour on Exposure.—Two clean lumps of the compact carbonate, the analysis of a sample of which is numbered XII. in the list given *ante*, p. 485, weighing together 25 grams, were exposed for some weeks at a mean temperature of about 10° C., and then weighed. They were found to have lost nearly 11 grams in weight; they were opaque, but they still preserved their shape and size. They could be lightly handled without soiling the fingers, and squeezed pretty firmly without being crushed. They were found to be fully changed to their centre. Their loss corresponded to 43 or 44 per cent. This nearly agrees with the calculated loss, which is about 42 per cent., if the amount of acid carbonate in the sample be approximately estimated by the quantity of water in it, according to the tables, *ante*, p. 485. The calculated loss by exposure of the carbonate formerly in commerce of the formula $(CO_3)_3(OH_2)_2(NH_3)_4$ is only 33 per cent. A sample of commercial carbonate lost by 24 hours' exposure, according to Dalton, 50 per cent. of its weight: this makes it probable that it had the composition I find the carbonate to have at present, for when free from any water in addition to that in the formula, this is just its calculated loss by exposure. In cold moist weather the commercial carbonate appears to be slightly deliquescent, but in consequence of other changes it is difficult to decide this point conclusively.

Behaviour when Heated.—The commercial carbonate gets moist when heated; it is, of course, gradually dissipated. The products of its distillation will be afterwards described.

Behaviour with Water.—It dissolves in four parts of water at 15°, according to my experiments. Perfectly clean lumps were weighed and dropped into a weighed quantity of water (fresh boiled and cold) in a stoppered bottle; the bottle was kept in a place at a temperature always very near 15°, and was often agitated. In different experiments varying proportions were used. On cooling slightly the saturated solution, it deposited crystals of acid carbonate. Cooled in ice the deposit of crystals was still more copious, and consisted always of acid carbonate; although it has been stated* that the half-acid carbonate then crystallizes out. As above determined, its solubility accords with that of the acid carbonate it contains, namely, about half its weight. The solubility of the carbonate which used to be in commerce has been variously stated as lying between that of 1 in 2 of water, and 1 in 4 of water; I think it must have been less than this. A saturated solution, unlike one of the acid carbonate, or of the half-acid carbonate, does not act like a saturated solution of carbonic anhydride. The strongest hot solution I have been able to make is that of 1 in $1\frac{1}{2}$ of water. This was made by dropping this proportion of the carbonate, crushed small, suddenly into the hot water contained in a wide-mouthed bottle fitted with a caoutchouc stopper, then closing the bottle and keeping it hot in the water-bath at a temperature of about 65° C. Only a little carbonic anhydride was lost. When made, the stopper of the bottle containing it could be withdrawn without anything more than a very slight escape of bubbles. The old carbonate of commerce is stated in Berzelius's 'Lehrbuch'† to be soluble in twice its weight of water at 49° C.

A cold saturated solution of the old carbonate was stated by Griffiths‡ to boil at a temperature of 82° C. John Davy found such a solution to decompose at a lower temperature than this, bubbles beginning to appear at 49° C. I have tested the modern carbonate, and find a solution of it of 1 in 4 begins to effervesce, though only slightly, at 60° C., effervesces copiously at 75°, and continues to do so as the temperature rises, which it does rapidly. At 85°, or a little below, the products of effervescence, which before consisted almost entirely of carbonic anhydride, contain much ammonia, and begin to condense on the neck of the flask or retort. At 100° C. the solution has given off all the carbonate it contained, and is nothing but water (Griffiths). I have just stated that the cold saturated solution differs from the saturated solution of half-acid carbonate, in not behaving like a saturated solution of carbonic anhydride; and there can be no doubt that this fact, and that of the point of incipient effervescence in the two solutions when heated being different, are due in part to the difference in the ratio of the ammonia to the carbonic anhydride in them. The following experiment shows the effect of dilution upon the production of effervescence. Some of the same solution as that used in the previous experiment was mixed before heating with an equal bulk of water (freshly boiled and cooled), and then did not begin to effervesce until about 70° C., was only in full effervescence at 80° C. or higher, and only at 90° C. began to yield products of effervescence, which condensed in the neck of the flask. In both these experiments the heat was applied by a water-bath. Griffiths' statement must not be supposed to be so much at variance with that of J. Davy as the latter seemed to consider it; for Griffiths meant apparently by the boiling-point of this solution the point at which the products of the effervescence begin to be such as undergo condensation, and this would probably occur with the old carbonate at about 82° C.

The action of a saturated solution upon more commercial carbonate is well known to be the production of a sort of skeleton of the pieces of carbonate, consisting of the acid carbonate. I have only to add that by prolonged digestion I have found the particles of this mealy skeleton to grow into, or be replaced by, transparent crystals of the same substance.

I have examined the effects of heating the commercial carbonate with a little water, and have found that bubbles of carbonic anhydride escape through the solution from the undissolved lumps at a lower temperature than they escape from a cold saturated solution heated alone. Thus, from about 40°–45° C. very slight effervescence was visible, due probably to an escape of the air entangled in the pores of the carbonate. At 47° decided effervescence commenced; this became copious at from 54°–56°, and at this temperature crystals began to form in the neck of the flask. (In this and the preceding experiments the mouth of the flask, as I should have mentioned before, was loosely closed so as to prevent diffusion of the vapours given off.) Cooled down to 51° the escape of bubbles ceased. Heated again and kept at from 56°–60° effervescence went on again, the condensation of the vapours appeared to be complete, and the lumps which had originally been barely covered with water disappeared entirely in a couple of hours. During their solution they seemed to dissolve entire, for no temporary residue of acid carbonate or any loss of translucency in the lumps was seen. The products of the distillation were examined, and the results of the examination will be found among those of the examination of the products of distillation. The solution on cooling deposited crystals first of acid carbonate, and then of half-acid carbonate, determined to be such by their form. The mother-liquor was a very concentrated solution of normal carbonate, with a very little acid carbonate. Tested for carbamate the result was negative. A modification of this treatment of water with the commercial carbonate, by which the three ammonium carbonates can be obtained, has been several times referred to in this paper.

Behaviour with Alcohol.—It is well known that rectified spirit dissolves out carbamate from the commercial carbonate, leaving undissolved the acid carbonate. Hünefeld,* in 1836, heated the commercial carbonate with spirit of 90 per cent., and found that at 47·5° C. some bubbles began to rise from the lumps, that this phenomenon became quite evident at 50°, and that from 56° to 62° there was copious effervescence of nothing but carbonic anhydride. Above this temperature the gases escaping condensed in the neck of the retort as a neutral compound, and the distillate which now formed was a neutral solution. I have repeated the experiment of heating the carbonate at present in commerce with spirit of about 90 per cent., with somewhat modified results. Of the products of distillation I shall say nothing at present. Minute bubbles began to escape from the lumps at 41°; at 45° there was very evident effervescence from the lumps; at 50° there was copious effervescence with a simmering noise; at 51° the products of the effervescence began to condense; while at 53° the effervescence was exceedingly great. The temperatures observed by me as marking the stages of this phenomenon are, therefore, lower than those observed by Hünefeld. The heat was applied by means of a water-bath, and the flask was loosely closed by a caoutchouc stopper to pre-

* Pelouze et Frémy. 'Traité de Chimie,' vol. ii. p. 483 (1861).

† Vol. iii. p. 313.

‡ 'Quarterly Journal of Science' (1825), vol. xviii. p. 91. "On the Boiling-points of Saturated Solutions."

* Journ. für prakt. Chemie, vol. vii. p. 25.

vent diffusion. On keeping the spirit for some hours at 52°, effervescence continued, and there was little or no loss of spirit; at the end of the operation the neck of the flask had become only thinly encrusted with the products of the effervescence, and the carbonate had only partly dissolved. The lumps on removal appeared externally to be but little altered in structure. Internally, too, they were unchanged; for fragments yielded on analysis 54·51 per cent. of carbonic anhydride, and 32·22 per cent. of ammonia. The spirit proved to be a little weaker than before, dry pearl-ash separating a little water. It contained a little ammonium carbamate, still less ammonium carbonate, and a marked though small quantity of ammonia. Left at a temperature of about 0° for two days, it did not crystallize.

Behaviour with Ammonia.—Concentrated ammonia-water in the cold dissolves out carbamate, and converts the acid carbonate into normal carbonate, either by removing half its carbonic anhydride, or by combining with it an atom of water. The commercial carbonate digested at 20°–25° in a closed vessel with a saturated solution of ammonia, as already described in the case of the normal and acid carbonates, slowly dissolves in apparently unlimited quantity, and the solution deposits on cooling crystals of ammonium carbamate, and a very little normal carbonate. The reaction may be thus represented:—

$$(CO_2)_2OH_2(NH_3)_3 + NH_3 = 2CO_2(NH_3)_2 + OH_2.$$

Behaviour when Heated with Anhydrous Potassium Carbonate.—As already described, the gases evolved condense to carbamate, ammonia escaping, according to this equation:—

$$(CO_2)_2OH_2(NH_3)_3 \quad + \quad CO_3K_2$$

$$= 2CO_3KH + \overbrace{CO_2 + 2NH_3}^{\text{Forming carbamate.}} + HN_3.$$

The contents of the retort have been found, in accordance with this equation, to be more or less completely acid potassium carbonate.* For a short time after the mixture is made, ammonia is evolved in very small quantity at ordinary temperatures, and escapes in bubbles through the mercury into which the beak of the retort is made to dip, but this is probably due to the presence of a little moisture. It is only at from 50°–60° that a material reaction is set up; and here a phenomenon presents itself which is of considerable interest. Nothing but ammonia is given off, and by maintaining the heat at 60°, this evolution of ammonia can be nearly or quite terminated before any carbamate-forming gases come off. It is not until the temperature is carried to 65° that the formation of carbamate begins, and not until it is carried on towards and up to 80° that the whole of the carbamate is obtained. Hence the reaction occurs distinctly in two stages, according to the following equations:—

$$\begin{aligned}\text{1st stage: } & (CO_2)_2OH_2(NH_3)_3 + CO_3K_2\\ &= NH_3 + CO_2(NH_3)_2,\ 2CO_3KH.\\ \text{or } &= NH_3 + CO_2(NH_3)_2,\ CO_3KH + CO_3KH.\\ \text{2nd stage: } & CO_2(NH_3)_2,\ CO_3KH\\ &= \underbrace{CO_2 + 2NH_3}_{\text{To form carbamate.}} + CO_3KH.\end{aligned}$$

Further proof of a union of the acid potassium carbonate with ammonium carbamate is afforded by the facts that on distilling the commercial carbonate with calcium chloride, the components of the carbamate are driven off at a temperature of 52°–65°, and that on heating carbamate alone, it is converted into vapour at 59° or 60°; whereas in the present case the carbamate is not formed until the temperature reaches 65°, and passes on to 80°. The special interest of this point is its bearing on the difficult question as to whether the commercial "carbonate of ammonia" is a double salt or only a mixture of salts.

Behaviour when heated with Anhydrous Calcium Chloride.—At a temperature of 50°–52°, the mixture evolves gases, a part of which condenses as carbamate, that escaping being carbonic anhydride; from this temperature up to 60° or so, the reaction goes on steadily, but the escape of carbonic anhydride greatly diminishes; how far the rate of formation of carbamate also slackens I have had no means of determining. The residue in the retort consists of unchanged anhydrous calcium chloride, of calcium carbonate and ammonium chloride.

When solid calcium chloride, with about two atoms of water, is mixed in coarse powder with the commercial carbonate, the smell of ammonia entirely disappears; and soon after the mixture has been made it gets warm, swells up considerably, and evolves quantities of carbonic anhydride. When the action is over, on heating the mass to 50° or above, more carbonic anhydride is evolved. I happened in one case to be so fortunate as to mix the two in equivalent proportions. The consequence was that nothing was given off but carbonic anhydride and water. The residue was a porous mass of ammonium chloride and calcium carbonate. Treated with water, a solution was obtained which gave a faint precipitate with solution of ammonium carbonate and ammonia, and on the other hand a faint opalescence with calcium chloride. The insoluble matter was calcium carbonate.

(*To be continued.*)

* The commercial carbonate of ammonia and sodium carbonate heated together have been used as a source of ammonia and bicarbonate of sodium.

MALT EXTRACT.

BY ALBERT E. EBERT.

The present time in the history of pharmacy may rightly be styled the era of "scientific specialties." The latest efforts in this direction are malt extracts. Two classes of preparations, under this title, are met with in the market, having widely different properties; one variety may be classed among alcoholic beverages; the other is purely saccharine in nature. To the first belong the preparations of Hoff and of Koch, the latter bearing the name of Liebig. Hoff's extract has obtained a ready sale by aid of extensive advertising, a fact which is surprising, after the exposures made by Hager and Wittstein. These chemists determined it to be simply a good article of *brewer's beer*, having an alcoholic strength of about 3 per cent., with an addition of marshmallow root, coriander, star-anise and grains of paradise, sweetened with glycerine or sugar, flavoured with the oils of lemon and orange, and coloured with burnt sugar. Koch's preparation purports to be similar to Hoff's, with the prominent advantage, well set forth in the words of the proprietor as follows:—"Owing to the facilities we have in manufacturing in this country, we are enabled to sell Koch's extract at the astonishingly low rate of $3.00 per dozen, or 30 cents for a single bottle." He magnanimously offers to suffering humanity lager beer at only six times its retail value, while Hoff charges about 50 per cent. more for the same article! How thankful we should be for his fortunate "advantage," and we must also feel deeply grateful after perusing the circular which accompanies this great medicine:—"The most eminent medical authorities in Europe, as well as in this country, agree that this new tonic is the best *dietetic and healing remedy* known to modern science, combining both the merits of a nutritious and palatable beverage, and the virtues of an unfailing medicine for general diseases of the lungs, the chest and the throat, while to those in good health it serves as a *pleasant table drink*, promoting their digestion and restoring and invigorating their appetite—(for what?). This malt extract offers the most beneficial relief to the sick all in cases where the stomach, the lungs or the throat are affected."

The reader will say, "But medical men do not recommend such nostrums." In reply, we will state that we have had prescriptions for this beer from men who lay claim to a scientific training, and have in each case advised the patient or messenger to procure the same by the gallon at some saloon, where they may obtain it at first cost.

This proves the truth of the saying, "There's something in a name;" and malt extract is equally as good a term as the celebrated strengthening tonic, "Stomach Bitters," whose chief advantage is the quantity of alcohol hidden by the high-sounding titles, and made into a fancy tippling drink by the aid of a few bitter roots, herbs and spices. But the greatest shame of all is the frequent recommendations and endorsements by letters which are published by the factors of these vile nostrums, and scattered broadcast to the public; and these testimonials are frequently from men who occupy prominent positions in science,—yes, even teachers in medical colleges. But, alas! we were lately astounded by seeing such an endorsement from a gentleman occupying the chair of Pharmacy in the St. Louis College of Pharmacy. His private endorsement might have been overlooked, but when he attached to his name his position in the College, to give it extra weight, he gave an insult to the entire organization in which he holds the office of a teacher; the remedy of making a few examples by excommunication would go far towards stopping this prostitution of our profession to such base uses.

Of the second class of malt extracts, sometimes called Liebig's, we have seen two samples from German manufacturers, Ed. Loeflund and Dr. H. E. Linck, both of Stuttgart. They were put up in patent medicine style, each claiming originality in the process of manufacture. This point is questionable, as malt extract has been officinal in the London, Edinburgh and Belgium Pharmacopœias, and in long use in Germany under the name of malt sugar (*Gersten-zucker*).

Professor Liebig does not lay any claim to the discovery or introduction of this preparation. We have heard him, during his lectures, denounce this attachment of his name to these extracts, it having been done in opposition to his wishes by parties who hoped to increase their sales by this seeming endorsement of their articles. We have lately made the malt extract at the urgent request of physicians, and give herewith the process, so that pharmacists may prepare it themselves, instead of relying upon the specialist to supply it at exorbitant prices.

Take of Barley Malt, kiln dried, 10 lb. av.
Water, q. s.

The malt can be obtained at the malt-houses or breweries by the bushel; reduce it by means of the drug mill so that it will pass through a No. 20 sieve, and add to the meal a sufficient quantity of cold water to form with it a soft dough; then add about two gallons of hot water, and apply heat so as to raise the temperature of the mixture to 150°, or not to exceed 158°. Maintain this temperature, with occasional stirring, for several hours, or until the whole of the starch is converted (by means of the diastase of the malt) into dextrine and glucose. The absence of starch can be ascertained by the application of tinct. iodine to a small quantity of the liquor, when, if the starch has been wholly converted, no blue coloration will be evident. Then express the liquor rapidly, and pass it through a strainer. This is the most difficult part of the process, as it speedily clogs the strainer. This can be averted to some extent by making a pulp by means of water from common unsized paper, or filtering-paper, and mixing this pulp with the expressed liquid previous to straining. The perfectly clear fluid is finally to be evaporated, by means of a water-bath, to the consistence of a thick syrup, having the sp. gr. 1·500, or approximately one pint, weighing $1\frac{1}{2}$ lb. av.

This extract has an agreeably, syrupy taste, and contains, besides the sugar of the malt, dextrine, albumen, and the phosphates of the grain. In very hot summer weather it is liable to go into fermentation, but this can be prevented by the addition of a small quantity of glycerine.—*The Chicago Pharmacist.*

Suicide by Carbolic Acid.—An inquest was held a few days back upon the body of a servant girl, who was found by her master lying dead in her room. It appeared from the evidence that she had been in depressed spirits, and suffering from pains in her head, and had committed suicide by drinking a quantity of carbolic acid, which had been obtained for disinfecting purposes. The coroner, Dr. Lankester, said the public ought to be put on their guard respecting this compound.

The Royal Society Medals.—The following award of medals was made at the annual meeting of the Royal Society on Nov. 30th:—The Copley medal to Mr. James Prescott Joule, F.R.S., for his experimental researches on the dynamical theory of heat; a Royal Medal to Professor W. H. Miller, Foreign Secretary to the Society, for his researches and writings on mineralogy and crystallography, and his scientific labours in connection with the national standard of weight; a Royal Medal to Mr. Thomas Davidson, F.R.S., for his work on the recent and fossil brachiopoda; and the Romford Medal to M. Alfred Olivier des Cloizeaux, for his researches in mineral optics.

How to Apply Leeches.—A correspondent in the *Lancet* writes, that having had occasion to order a mustard-poultice for a patient, it became requisite to put some leeches on the same place. He was told that they fastened instantly, filled rapidly, and that the blood streamed afterwards into bread-poultices as if it would never stop. Now, whenever he orders leeches, he always has a mustard-poultice applied first, then the leeches (two or three instead of half-a-dozen), and then bread-poultices. The flow of blood is, however, sometimes so much greater than would be thought likely or possible, that it is necessary to add a few words of caution,—an adult female patient, of average strength, bled to fainting from only two leeches applied in this way.

Origin of Malaria.—*The British Medical Journal* in noticing a book by Dr. Taussig, alludes to the theory of Dr. Balestra, who considers the malaria prevalent at Rome to be due to the seeds of a microscopic alga constantly present in all marshes, for whose vegetation and propagation the necessary conditions are stagnant water, a high temperature, and the vicinity of decomposing vegetable matter. These spores, he says, can be introduced into the system by the stomach, lungs, or skin, but when brought into contact with a solution of either sulphite of soda, arsenic, or quinine, they lose all power of vegetation, and undergo a change of structure.

Almond Powder for Preparing Emulsions.—M. Ch. Menière suggests the following means of facilitating the dispensing of almond emulsions: Make an emulsion of almonds blanched, 50 grams, and water, then add 300 grams of sugar in powder, and evaporate with a gentle heat until the mixture assumes a pasty consistence; spread it upon plates, dry thoroughly by artificial heat, and reduce it to powder, adding five grams of pulverized tragacanth. To prepare the emulsions of the Codex, take of the powder 32·5 parts, and triturate with orange-flower water 10, common water 120 parts. According to M. Menière, an emulsion can thus be speedily prepared, and leaves nothing to be desired.—*Journ. de Pharmacie et de Chimie.*

Syrup of Iodide of Iron.—M. Jeannel has observed that the addition of $\frac{1}{5000}$ part of tartaric acid renders syrup of iron clear when it has decomposed, at the same time diminishing notably its inky taste.—*Bull. de la Soc. de Pharm. de Bordeaux.*

The Pharmaceutical Journal.

SATURDAY, DECEMBER 24, 1870.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

THE PROPOSED POISON REGULATIONS.

IN referring last week to the decision of the Council to submit a code of regulations for the keeping of Poisons to the Annual Meeting of the Society in May next, we felt constrained to express a hope that the prevailing divergence of opinion on this subject might not be allowed to damage the real interest (by which we meant the advancement) of Pharmacy as a craft. The letters which we publish this week evidently show that earnest attention is being directed to the subject. Several others, which have arrived too late for insertion in this number, also tell the same story. It cannot be denied that there is a great difference of opinion, and it will, we presume, be readily admitted, that both parties to the argument are honest, the one in advocating, the other in deprecating, any action in this matter. While abstaining from comment on the arguments brought forward by our correspondents, it seems that, in furtherance of the hope we expressed last week, it is our duty to urge upon members of the trade, for the sake of avoiding that mischance which struck us as possible, they should, in discussing this question, carefully dismiss from their minds every feeling of antagonism and, before the Annual Meeting, very carefully consider the proposition put to them by the Council,—a Council consisting of practical men, whose interests and mode of conducting business are identical with those of chemists and druggists in all parts of the country.

We think, too, that beyond mere *consideration*, there is ample time for *practical trial* of the methods proposed for storing poisons, and that such trial would enable both the advocates and opponents of regulations to speak more confidently as to the advantages or inconveniences attending those methods when the subject comes on for discussion in May next. There can be little doubt that there is a demand on the part of the public for some restrictions and that the officers of the Privy Council agree with and support that demand: moreover, our Council considers that the Pharmaceutical Society, in accepting the Pharmacy Act of 1868, also accepted the duty of promoting public safety and by implication, that of making regulations. It should be remembered, too, that the Council received instructions from the meeting of 1870 to consider this subject carefully, and present it again in 1871. It should also be borne in mind that, if we are to have regulations, no persons can be so well qualified to determine the nature of them as experienced men of our own body.

For all these reasons, therefore, we say, let the Council have credit for honesty and independence, and at least a fair hearing.

Having said thus much in the hope of confining controversy to its proper limits, we will conclude by again describing in detail the regulations as now proposed, noting also the alterations that have been made by the Committee, in the hope that our readers will test their applicability.

The first rule, and the only one to be universal, is that every poison shall be marked with its name, and shall bear, beyond that, a distinguishing mark which will be known to the dispenser as indicative of poison.

The alteration here is that the word "Poison," which it was feared would strike terror into the mind of customers, is exchanged for any mark a chemist may choose to employ, intelligible to himself and his assistants—say, a triangle, circle, or square.

We have then a proposition of three different and alternative modes in which poisons may be kept, and it should be distinctly understood the Committee does not recommend that a man should be compelled to select one of those three and apply it to all his poisons; such a course would be obviously impracticable. A chemist may apply any of the modes as best suited to his convenience; the first to one poison, the second or third to others.

These three modes of keeping poisons have not been altered in substance, but are now stated more clearly than formerly. It is proposed that poisons shall be kept either in—

(1.) A separate compartment for dangerous articles;

or,

(2.) Distinctive bottles or vessels;

or,

(3.) Bottles or vessels so tied over or secured that they cannot be opened by mere unstopping as the ordinary bottles are.

We observe that the proposal, to send out compounds, intended for external use in distinctive bottles, when they contain poisons, has been omitted from the new code. This alteration we understand was made by the Committee on account of difficulties which might arise as to procuring or keeping in stock at all times, a supply of such bottles, but notwithstanding this omission, we hope a custom so salutary and now so widely practised among druggists will not be discontinued.

THE POOR-LAW APOTHECARY-GENERAL FOR IRELAND.

In reply to several inquiries that have been made in connection with the above subject, we give, for the benefit of our readers, all the essential points contained in the general order of the Poor-Law Commissioners for Ireland; any further information would be supplied by the Commissioners on application by an intended candidate for the office, addressed to the Chief Clerk, Dublin.

The salary will be £500 per annum, with suitable apartments. Although this officer will be elected by the Guardians of the Unions, the Commissioners will have the power to discharge him.

The Poor-Law Apothecary will have to give security for the "due and faithful performance of his duties," in an amount not exceeding £5000.

The qualifications are—

"1. He shall be thirty years of age at least.

"2. He shall be a Licentiate of the Apothecaries' Hall of Ireland.

"3. He shall not, while holding the office of Poor-Law Unions Apothecary, be engaged or interested, either directly or indirectly, in any wholesale or retail trade of drugs, medicines, or medical or surgical appliances, or in any other trade or profession whatsoever."

The following is the copy of the mode of appointment:—

"On or before the 1st of January, in the year 1871, all candidates for the office of Poor-Law Unions Apothecary shall send their application and testimonials to us the said Commissioners, to be laid before the Guardians of each of the said Unions, who shall proceed at the second meeting after the receipt thereof to select the candidate of their choice in accordance with the rules prescribed for the appointment of officers after advertisement in the General Regulation Order, bearing date the 19th January, 1852, and shall report the result of such selection to us the said Commissioners, and the candidate selected by a majority of the Unions in the said schedule shall be deemed to be appointed the Poor-Law Unions Apothecary, and if no candidate shall have been selected by a majority of the whole number of Unions, so many of the candidates selected by the greatest number of Unions as shall together have been selected by a majority thereof, shall be again submitted to each Union, and the same process shall be repeated until one candidate shall have been selected by a majority of all the Unions named in the schedule."

There are about 160 Unions in Ireland, and they generally have weekly meetings of the Boards. We believe that the above contains all the necessary information that would be required by intended candidates. There are other officers to be appointed, but the Commissioners do not intend to open this question until after the election of the Apothecary, which is not likely to be finished until February, 1871.

THE BRITISH PHARMACOPŒIA IN CANADA.

In the November number of the *Canadian Pharmaceutical Journal* there is a curious commentary upon the statement made by Mr. Howden in his address at the last Evening Meeting, that wherever he went in the United States, the fact that he was a member of the Pharmaceutical Society of Great Britain secured for him the greatest kindness and the fullest information from every pharmacist with whom he came in contact. The Editor of that journal says that a letter had been received from a correspondent asking for information concerning the price of a work which he understood had been "recently published, and which, under the general title of *The British Pharmacopœia*, at once did away with the annoyance so often realized from the use of the different authorities representing the national colleges." The writer of the letter stated that he "went in strongly for progress," and that as he considered the publication of such a work to be a step in the right direction, he meant to obtain a copy of the Pharmacopœia at once, so as to be fully up to the times.

Of course it would not be fair to take such pharmaceutical Rip Van Winkleism as representing the general state of knowledge in the colony concerning our national Pharmacopœia, six years after its publication; neither, on the other hand, must it be taken for granted that the writer of the letter was far behind his neighbours, for it appears that he is a druggist doing a good business in a flourishing border town. Doubtless one of the causes of such a state of things is to be found in the absence, at present, of any authoritative direction that the British Pharmacopœia is the standard to be used; this evil it is proposed shall be remedied in the projected Canadian Pharmacy Bill; but another cause lies in the want of sufficient opportunities for obtaining sound pharmaceutical education. Besides these, there is undoubtedly another cause, viz. the strong influence which the United States Pharmacy exercises upon the Canadians. It is stated that if a prescription requiring tinct. arnicæ were to be sent to each druggist in Ontario, in nearly every case the United States' preparation would be used. There is also a tendency to favour the fluid extracts or concentrated remedies of that country, and to make use of the ingenious preparations which come under the category of "Elegant Pharmacy."

Whether the British Pharmacopœia be best suited to the wants of Canadian pharmacy, or whether Canada would be better off with a Pharmacopœia of her own, are points we are not at present prepared to discuss; but we think the fact with which we started is one that may not be without its use in toning down any exaggerated estimates that may have been formed as to the influence of English Pharmacy in America.

PHARMACY AND THE STATE.

To those who are zealous in their efforts to promote the interest of British Pharmacy and to those who have laboured at this work, the views expressed in the following quotation will be at once a stimulus and a reward. It is with great pleasure we record this acknowledgment that during the last thirty years the Society has done some service, and that the objects for which it was formed have not only been to some extent realized but also appreciated.

"The Appendix further contains Reports on a subject of great practical interest to the public—the examination of chemists and druggists prior to their being permitted to commence business. The report on the London examinations is by Dr. Greenhow, that on the Edinburgh examinations by Dr. Christison. In former times the business of a chemist and druggist was subject to no kind of restriction, and was even frequently added on to other trades, such as the sale of groceries, by persons who had no knowledge whatever of the characters of drugs, who were incapable of compounding a prescription, and who sometimes committed homicide by misadventure, from their ignorance of the dangerous commodities which they sold. The Pharmaceutical Society strove for many years to remedy these evils; and after carrying on for some time a system of voluntary examination, at last succeeded in procuring that this examination should be rendered obligatory upon all who deal in drugs. It is now so conducted as to assume three forms —the *major* and *minor* examinations, which are intended to be permanent, and the modified examination, which will be only temporary. The major examination admits those who pass it to be registered as "pharmaceutical chemists;" the minor, as "chemists and druggists;" and the modified admits those to be chemists and druggists who were fairly embarked in the vocation before the provisions of the Pharmacy Act became binding. The inspection of the examinations by men so eminent as Drs. Greenhow and Christison is a matter for which the medical department of the Privy Council deserves much commendation. The supply of medicines to the sick, once regarded as a proper function of those general medical practitioners who attend the great bulk of the community, has now been very generally abandoned by them, not only in great cities, but also in provincial towns and rural districts. Indications are not wanting that it will before long be abandoned altogether, and that medical men of all classes will limit themselves to prescribing the remedies which their patients require. A few years ago this could not have been done with safety, but now, thanks to the Pharmaceutical Society and its Act, a sick man will find almost everywhere a chemist who may be trusted to dispense any prescription, and who will have under his hand, save in exceptional cases, the preparations necessary for the purpose. It is not needful to follow the two inspectors into the details of their reports, but we have pleasure in recording the conclusion of Dr. Greenhow, "that the examinations are of such sort, and are conducted in such a manner as to constitute a sufficient guarantee to the public;" and that of Dr. Christison, that "the results of the examination seem to me satisfactory in every point of view." The Pharmaceutical Society could receive no more flattering testimony to the character and value of its labours."—*Times.*

Dr. Henry E. Armstrong has been appointed Professor of Chemistry at the London Institution, an office once held by Mr. W. R. Grove, Q.C., F.R.S., and subsequently by Mr. J. Alfred Wanklyn. Dr. Armstrong studied chemistry under Professors Hofmann, Frankland and Kolbe, and has been associated with Dr. Frankland and the late Dr. Matthiessen in original researches. We understand that this appointment is connected with a project for establishing Practical Chemistry classes in the laboratory of the London Institution.

A contribution of twenty guineas has been made to the Benevolent Fund by the Local Committee of the Pharmaceutical Conference lately held at Liverpool, out of the surplus of the local fund remaining after the expenses incurred had been paid.

Proceedings of the Pharmaceutical Society.

EXAMINATION IN LONDON.

December 21st, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

Twenty Candidates presented themselves for examination, ten Major and ten Minor; the following passed and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

*Skipper, Edward	London.
*Pick, Richard	Hull.
*Clark, Walter Beales	Leicester.
*Cross, William Gowen	Shrewsbury.
*Taylor, John William	Great Grimsby.
*Griffin, Thomas	Bromley.
Thompson, John Thomas	Richmond, Yorks.

MINOR (as Chemists and Druggists).

*Brown, James	Bideford.
*Davenport, Horace	London.
Field, Charles	Netley.
Morgan, William John	Kinver, Stourbridge.
Stoakes, Benjamin Maiden	Boston.
Sant, George	Atherstone.
Marks, Benjamin	Plymouth.
Spong, Douglas Morton	Bedford.
Skinner, Kenneth George Walrond	Christchurch.
Biddle, Charles John	Manchester.

The above names are arranged in order of merit.

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* Passed with honours.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fourth General Meeting of the present session was held at the Royal Institution, December 8th; the President, Mr. JOHN ABRAHAM, in the chair.

The minutes of the preceding meeting having been read, the PRESIDENT said he must correct the statement that he said he had always obtained 15 fluid ounces of distilled product in following the Pharmacopœia process for spirit of nitrous ether. He stated the contrary, but suggested that the fact might be owing to imperfect condensation, and that the loss might perhaps be obviated by putting the rectified spirit into the receiver instead of adding it subsequently. The alteration having been made, the minutes were confirmed.

Mr. S. G. HILDITCH exhibited four samples of products taken in the distillation of sp. æther. nitros., B. Ph.:

No. 1 being taken when (working on four times the B. Ph. quantity) two gallons had distilled over which contained 50 per cent. of nitrous ether ($C_2H_5NO_2$).

No. 2, when two gallons six pints had been collected, which contained 48 per cent. of $C_2H_5NO_2$.

No. 3. A fresh receiver was then adapted, and the distillation continued until one gallon had been collected; and on testing this with chloride of calcium, he could not get any separation of $C_2H_5NO_2$. The receiver was again changed, and heat (steam) being increased, the distillation was continued until nothing more would distil over. In this way he obtained forty-eight ounces of a liquid consisting principally of spirit and water, having a very disagreeable smell.

No. 4 represented this product.

The SECRETARY then read a letter which had been received by the President.

[The letter is essentially the same as the letter from Messrs. Fox to the Editor, already printed in the Journal, p. 479.]

The PRESIDENT said that it did not appear that Messrs. Fox complained that he had said anything which was not correct, but they objected to the inferences he had drawn from the facts. He had, however, nothing to withdraw. They had sent him a handbill, in which one of the testimonials referred to the fact that their preparation contained only 50 per cent. of cod-liver oil; but the handbill round the bottle which he had exhibited contained no such statement, and he could not but think that if they had wished it to be known that "palatable cod-liver oil" contained only half oil, the rest being sugar and water flavoured, they might have taken more effectual means to accomplish their purpose. Be that as it may, he had contented himself with showing the composition of the mixture, and that the label was so put on the bottle as to conceal the fact from all but careful examination. He also observed that gentlemen who called themselves Fellows of the Chemical Society, who professed to have analysed the oil, gave testimonials which did not convey the slightest idea of its composition, and left their readers to infer that it had been made palatable by some unobjectionable process. In the new testimonials which Messrs. Fox had sent with their letter, he observed very prominently the name of a gentleman whom he could not refer to except in terms of respect. It was Dr. A. H. Hassall, who, as a commissioner for the *Lancet*, had done so much to make known the composition of important articles when their names failed to do so. He says that flavouring and other ingredients have been added, but he does not tell us that they form one-half of the mixture. His (the President's) object was that this should be known to those who sold and to those who bought it.

Mr. EDWARD DAVIES, F.C.S., heartily agreed with the President, and showed that the oil was not and could not be *a combination*. He said that, knowing the whole system of testimonial-giving was thoroughly rotten, being applied wholesale instead of confined to the sample analysed, he was glad (as an analytical chemist) for the sake of his profession that this practice was confined to a few conspicuous individuals.

Mr. T. F. ABRAHAM said the oil professed to be patented.

The SECRETARY stated that Messrs. Fox had registered the word "palatable" as a trade mark, but this would be invalid if it could be proved that any one else had previously applied the term.

Mr. HILDITCH said he had been informed by legal gentlemen that many of these patents were of no more value than the paper upon which they were written, and gave instances where so-called patent processes were invalid.

Mr. ALFRED H. MASON, the Honorary Secretary, thought the oil should be condemned by pharmaceutists as an inelegant preparation, a decided separation being present, and no *combination*, as Messrs. Fox had stated in their letter. He had seen a short time ago in one of the New York medical journals a formulary for cod-liver oil cream.* The sample exhibited consisted of a solution of gum tragacanth (2 drachms being dissolved in 16 ounces of cold water), to which 50 per cent. of oil was added, flavoured with essence of lemon, essence of almonds and cassia, sweetened with syrup of tolu. This mixture did not show any separation, as the tragacanth broke up the oil into such minute particles that it was held in suspension, and it thus formed an elegant emulsion very pleasant to the palate.

Mr. REDFORD fully concurred with the remarks which had been made, and felt that there was not anything to withdraw from what had already been made public in the report of the proceedings of a former meeting.

Several other miscellaneous communications were made by Messrs. Hilditch, Tanner, Davies, T. F. Abraham, Redford, and Hallawell.

Before closing the meeting, the President gave a very interesting *résumé* of a paper he had heard read the previous evening at the Pharmaceutical Society's meeting by Mr. Howden, on "The State of Pharmacy in the United States."

After the usual votes of thanks were passed, the meeting adjourned.

Proceedings of Scientific Societies.

THE EXHIBITION OF CHEMICALS, DRUGS, ETC., AT THE RECENT MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT BALTIMORE.

Our space will not permit us to do justice to this attractive feature of the annual gatherings of the Association. Though the exhibition was hardly equal in variety and extent to the display made at the meeting of last year, in Chicago, it was exceedingly good, and the articles were arranged with most excellent taste, so that they might be seen to the best advantage. As usual, Messrs. Powers and Weightman, of Philadelphia, made the most attractive and valuable contribution, many of their specimens being in large quantities, a single vase containing upwards of 1000 dollars worth of sulphate of morphia. Many of their specimens were particularly remarked on account of their superior beauty.

Messrs. Charles T. White and Co., of New York, also made a most attractive display. This house is rapidly gaining a national reputation for the purity of its products, and certainly no one familiar with the appearance of fine chemicals could view their collection without being struck with the rare beauty of almost every article. They exhibited upwards of forty specimens, among them the salts of morphia, which they are largely manufac-

* I have since found that the article referred to was extracted from a letter signed "Emulsio," published in the *Chemist and Druggist* for April, 1870, p. 121.—A.H. MASON.

turing. It is needless to say that they were invariably admired.

Messrs. Rosengarten and Sons, Philadelphia, exhibited a case of fifty-six specimens of chemicals from their laboratory, including fine crystals of the hypophosphites of lime, soda, and potassa: piperine, permanganate of potassa, and a variety of salts of the alkaloids.

Messrs. Schering and Gatz, New York, exhibited thirty-two specimens, mostly of rare chemicals, produced by E. Schering, of Berlin.

Andrews and Thompson, of Baltimore, exhibited a variety of handsome chemicals,—among others were sesquichloride of chromium, scaled salts of iron, hypophosphite of manganese, and phosphate of manganese; also a living specimen of the Benne plant.

Messrs. Thomsen and Block, of Baltimore, contributed specimens of glacial phosphoric acid, valerianate of zinc, carbolic acid, nineteen varieties of fluid extracts, a number of essential oils, and a large collection of materia medica specimens.

The Baltimore chemical works exhibited specimens of acetate of lead, acetic acid, fine crystals of the iodide and bromide of potassium, and many other chemicals.

The Baltimore chrome works exhibited extensive specimens of bichromate of potassa, and the chrome ore from which it is prepared.

The display in the materia medica department was large and varied.

Messrs. M'Kesson and Robbins, New York, exhibited a very extensive collection of gums and gum-resins, in the whole and powdered state.

Messrs. B. O. and G. C. Wilson exhibited specimens of their herbs, pressed and unpressed, numbering about sixty. This firm have gained an enviable reputation for the quality of their goods; their herbs are deprived of the large stalks, and only the leaves and leaf-stalks are sent out of their establishment. Their specimens were excellent throughout.

Robert Shoemaker and Co., Philadelphia, exhibited an extensive variety of powdered drugs.

Dr. E. R. Squibb, Brooklyn—Two cases of rhubarb.

PHARMACEUTICAL AND OTHER SPECIMENS.

Messrs. Bullock and Crenshaw, Philadelphia, exhibited sugar-coated pills in great variety, and presenting the handsomest appearance, fully sustaining their well-deserved reputation.

Messrs. Mellor and Rittenhouse, Philadelphia, made an extensive display of fruit essences, solid and fluid extracts, etc.

Mr. S. Mason M'Collin, Philadelphia, exhibited a variety of spread plasters of excellent quality, and also court plaster, Breed's gutta-percha pessaries, and flavouring extracts, etc.

Messrs. Hance Brothers and White, Philadelphia—Solid and fluid extracts in great variety, fruit essences, and sugar-coated pills; also, a new pattern of a geared drug-mill for apothecaries' use, and Hance's percolator.

Mr. Robt. Platzer, Philadelphia, exhibited about fifty specimens of essential oils, many of them exceedingly rare; also, a number of foreign drugs.

E. Parrish and Son, Philadelphia, exhibited various pharmaceutical specimens, and also apparatus.

Mr. W. C. Bakes presented a new style of pestle and mortar machine, worked by hand power; also, various contrivances for facilitating the dispensing and preservation of medicines.

Mr. Wm. Warner, Philadelphia, exhibited a variety of sugar-coated pills.

Dr. W. H. Pile exhibited a variety of hydrometers, burettes, graduated measures, etc.

Mr. Charles Shivers, Philadelphia.—Samples of spread plasters in yard rolls.

Mr. Henry Troemner, Philadelphia, exhibited his improved drug mill and prescription scales.

Messrs. Burroughs Bros., Baltimore, exhibited a most extensive collection of fluid extracts of their own manufacture, including almost two hundred specimens.

Messrs. Sharpe and Dohme, Baltimore, made a creditable display of fluid extracts, syrups, etc.

Professor J. Farris Moore, Baltimore, also exhibited some fine specimens of fluid extracts and other pharmaceutical preparations.

Mr. N. Hynson Jennings, of Baltimore, exhibited a collection of specialities and toilet articles.

Messrs. S. Campbell and Co., Philadelphia, exhibited fluid extracts made by direct percolation, without evaporation; also a variety of elixirs, syrups, and toilet perfumes.

Mr. Geo. S. Dickey, San Francisco, contributed five samples of Monsel's salt, in scales, granules, and powder.

Messrs. Hartman, Laist and Co., Cincinnati, exhibited specimens of pure, inodorous glycerine, very beautiful in appearance; also, fine specimens of Epsom and Rochelle salts.

John Mathews, New York, placed on exhibition a magnificent draught stand for soda water, constructed of mottled marble, with silver ornamentations.

Glassware and shop furniture, in tasty and beautiful styles, and druggists' sundries, were exhibited by Messrs. J. Quinlan, New York; Adams and Drexel, Baltimore, and Whitehall, Tatum and Co., Philadelphia.

Messrs. Battley and Watts, London, England, exhibited samples of liquid extracts, prepared by the processes of the B. Ph.

Among the objects of great interest must be mentioned the microscopic specimens exhibited by Dr. F. Hoffman, of New York. The specimens were mostly illustrative of the materia medica, and were mounted by Mr. C. Rodig, of Hamburg, Germany.

In conclusion, we may say that the exhibition was most satisfactory, and reflected great credit upon the exhibitors, and also upon the members of the local Committee in Baltimore, who had made such ample and excellent provisions for the occasion.—*The Chicago Pharmacist.*

LINNEAN SOCIETY.

At the meeting held Dec. 15th, a paper was read on 'Sabadilla" (*Asagræa officinalis*, Lindl., *Sabadilla officinarum*, Mandt.), from Caracas, by A. Ernst. The writer remarked that it does not appear to be generally known that a considerable quantity of Sabadilla is exported from Caracas and Venezuela, amounting to from 3000 to 3500 quintals annually; almost the whole being sent to Hamburg. The plant is a very common one by the roadsides in Caracas, but the greatest part of the drug comes from the hilly regions in the south, where it grows at an elevation of from 3500 to 4000 ft. It was originally discovered in the Mexican Andes, and is not known elsewhere. Although not mentioned by Humboldt, it is, however, apparently indigenous in Venezuela. It flowers in August and September, while Humboldt was there in the dry season; and it is besides very local in its distribution. The writer bases his belief in its being indigenous on several circumstances. In the first place the spots where it grows are the most unlikely for it to have been planted; and it has no special means of easily spreading its seeds. There is no record of its introduction; yet it was known long before the seeds were first exported by German druggists. The Caracasian form differs slightly in the width of the leaves and a few other characters from the typical *A. officinalis*, of Mexico, and might be called *A. caracasana*, but the writers did not considerit specifically distinct. The bulbs contain numerous raphides of oxalate of lime.

In the discussion which followed, the PRESIDENT (Mr Bentham) agreed with the writer, that there was not sufficient ground for forming the Caracasian Sabadilla into a distinct species, especially as Lindley's description was drawn from dried specimens. Mr. HANBURY complained that the writer had not accompanied his paper with specimens of the plant. He said it was a mistake to suppose that pharmacologists are not aware that the drug is exported from Venezuela. The fact is mentioned by Flückiger, of Berne; while Berg and Schmidt even mention the difference between the two varieties.

Parliamentary and Law Proceedings.

SALE OF PATENT MEDICINES WITHOUT STAMP OR LICENCE.

On Tuesday, Dec. 13, John Marston, jun., of 44, Great Charles Street, Birmingham, appeared at the Derby Borough Police Court, in answer to a summons obtained by the excise officer, charging him with selling patent medicines without a licence, at 9, Sitwell Street, Derby.

The officer deposed that on the 24th of September he went to No. 9, Sitwell Street, and saw a brass plate on the outside, having on it the name of J. W. Hunter, and on an inner door the name of Dr. Hunter. When he entered the room, he saw a person named Manning, and asked for a box of red pills. Manning left the room and shortly afterwards returned with the box of pills and a book. Witness gave him 2*s.* 9*d.* for the pills, which were without the government stamp.

Thomas Place, supervisor, Birmingham, said that on the 7th October, he called at the establishment of Dr. Hunter, in Birmingham, and saw the defendant. The name of J. W. Hunter was on the door. The defendant informed him that his father had bought the business of Dr. Hunter some years ago, and that he had re-bought it of his father; and he also stated that he had agents in Nottingham and Derby, and that his Derby agent dispensed his medicines. Defendant informed him that on purchasing stamps at the Birmingham Stamp Office, he had applied for a licence, but was told that it was not the time for granting them, and that he should receive notice when that time arrived. He had not applied for a licence, however, and the present proceedings had been taken in consequence.

The defendant, who stated that Manning had acted without his authority, was fined £20, the full penalty for the offence, which the magistrates unanimously decided not to mitigate.—*Derby Mercury.*

POISONING BY ARSENIC IN IRELAND.

An inquest was held on Monday, December 12th, at Rahoon, upon the body of Mr. John Holton. It was stated in evidence by his wife that there had been a quarrel between her and the deceased on Friday while at a cattle fair. When he returned home he was retching very much, and she heard him say that he had taken two doses of poison. She thought he was under the influence of drink. Medical assistance was procured, but he died the following day.

Dr. Colahan stated that he found the deceased suffering from the effects of arsenic. He administered the usual antidotes and used the stomach-pump, but although the deceased was relieved considerably, he died from arsenical poisoning.

George Brokie deposed that he was an assistant to Mr. James M'Swinney, who kept a druggist's establishment as well as an apothecary's. On Friday night, a person whom he knew to be Holton, the deceased, came into the shop to purchase arsenic. Upon asking him what he wanted it for, he replied to poison rats. Witness said he considered him perfectly sober and sold him about a drachm of pure arsenic. He did not keep a book for the purpose of registering the sale of arsenic, but a couple of hours after the sale he entered it in the shop-blotter. The packet was marked "poison" on a red label and "arsenic" on the shop label. He cautioned the deceased to be careful with it.

Henry O'Reilly said he was an assistant in the establishment of Mr. Staunton. Holton, whom he knew, came into the shop, he thought on Friday; when witness began to quiz him about feeding-bottles. After a time, deceased, who was perfectly sober, said he wanted some arsenic to poison rats. Witness said he would give it to him if he would promise to be very cautious, and he told him the danger attending its use. He could not say whether he sold or gave it to him, or whether he received any money or not. It was pure arsenic, not mixed in any way with colouring-matter,—a perfectly white powder. He kept no register, nor did he enter it in any book. The packet was marked "poison" and "arsenic."

The jury returned a verdict that deceased died from the effects of arsenic administered by himself.—*Galway Vindicator.*

Obituary.

December 8, at his residence, 33, Rue Magnan, Paris, aged 36, ROBERT JOHN FOWLER. Mr. Fowler was born at Gloucester, and entered the profession of pharmacy by apprenticeship to Mr. Harvey, of Leeds. His tastes and pursuits had a strong bias towards experimental science, and photography was a subject to which he devoted much attention. The introduction of the collodion process produced a rapid revolution in photography, and its trade aspect developed proportionately, so that Mr. Fowler's energies were concentrated upon the new department of the business in which he was engaged. In the year 1860, Mr. Fowler became a partner in the firm of Harvey, Reynolds and Fowler, but repeated attacks of congestion of the lungs compelled him in about four years to relinquish this position and he settled in Paris, the climate of which appeared to suit him much better than that of England. He soon established a special kind of business as commission agent in matters relating to chemistry, pharmacy and experimental science, acting as the medium alike of importers and exporters. During the Paris Exhibition of 1867, he was the representative of a large number of English exhibitors, and his assistance was greatly appreciated by his countrymen. For several years Mr. Fowler held the post of Paris correspondent of the *British Journal of Photography*, his letters appearing almost weekly, and often giving the earliest information about discoveries in physical science generally, as well as the novelties of photography. We do not learn that Mr. Fowler's life was shortened by the effects of the siege. The mischief to the lungs had long since developed consumptive symptoms and his death occurred after a short and rather sudden accession of illness. He has left a widow and one or more young children, who of course are still shut up in the besieged city.

Review.

ELEMENTARY CHEMISTRY. By the Rev. H. MARTYN HART, M.A. 8vo, pp. 287. Cassell, Petter and Galpin.

We begin by praise because we intend to blame. This small volume is very nicely and clearly printed, neatly got up, the woodcuts are numerous and good, and the price is moderate. The author, too, has evidently taken pains with his writing; he is probably a good teacher, and certainly possesses the faculty of putting in a clear and intelligible form those things which he himself understands. But the fault we have to find is that he is not sufficiently instructed in the subject upon which he professes to write.

The impression we have derived from a careful examination of the little book before us is this: it is an abridgment, imperfectly effected, of Miller's Chemistry. It is, in fact, just such an epitome as a student reading that work would compile for his own use. But not only is there no originality displayed in the manner of treating the subject, in the arrangement of the matter, or in the illustrations made use of, but over all the book hangs that crude and superficial air, the appearance of which lets the cat out of the bag. Added to this, there are even quite early in its pages several very serious mis-statements. Not to cavil, we pass over the Introduction, and in Chapter II. we find, succeeding a table of the elements, the following passage:—"The numbers in the third column are the *combining weights*, or, as they are sometimes called, the *equivalent numbers* or *atomic weights*." And then a little further on:—"It is to be remembered then, that the *equivalent number* of any element signifies the relation in weight which the atom of that element bears to an atom of hydrogen; and since chemical compounds are formed by the union of atoms, the atomic weight will also represent the weight in which the element will enter into combination. Sometimes one, two or many atoms enter into the compound, so that whatever may be the quantity of the element, it must always be a multiple of the atomic weight; hence the name *combining weight*. And it very frequently happens that one element in a compound is replaced by another, one atom taking the place of another, the weight of one atom being equivalent to the weight of the other; hence the name *equivalent number*." Only a few lines lower down we are told that "a salt is a compound of an *acid* and a *base*." An acid is a body possessing a sour taste, and "is now defined to be a salt of hydrogen." "A base is a body which will combine with an acid to form a salt. The alkalies are the strongest bases. A base is generally the oxide of a metal." What a curious state of confusion must the author's mind have been in when he penned these sentences! We are only certain of this, that if a boy of sixteen presented himself at the London University Matriculation examination in such a condition of mental fog, he would inevitably be "spun" without mercy. Now that the teaching of science to boys and girls is becoming more and more the fashion, it behoves us to condemn uncompromisingly all that is not of the soundest and clearest. Let those schoolmasters who must needs be their own professors bear ever in mind that in proportion as the possession of practical and lucid scientific ideas is of greater importance than ever so critical an acquaintance with dead languages, so the slightest haziness in this department of mental culture is more pernicious than any number of imperfections in such an art as Latin versification.

BOOKS RECEIVED.

NOTE-BOOK OF MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS. By R. E. SCORESBY-JACKSON, M.D., F.R.S.E., etc. Second Edition, Revised, Enlarged and brought down to the Present time, by ANGUS MACDONALD, M.A., formerly Lecturer on Mat. Med. and Therapeutics at Surgeons' Hall. Edinburgh: Maclachlan and Stewart, 64, South Bridge. London: Simpkin, Marshall and Co.

DIE PFLANZENSTOFFE IN CHEMISCHER, PHYSIOLOGISCHER, PHARMACOLOGISCHER UND TOXICOLOGISCHER HINSICHT. Für Aerzte, Apotheker, Chemiker und Pharmakologen bearbeitet von Dr. Aug. Husemann und Dr. Theod. Husemann. Dritte Lieferung (Bogen 34–51). Berlin. 1870. From the Editors, through Mr. Nutt.

INTRODUCTION TO THE STUDY OF INORGANIC CHEMISTRY. By WILLIAM ALLEN MILLER, M.D., D.C.L., LL.D. London: Longmans, Green and Co. 1871. From the Publishers.

The following journals have been received:—The 'British Medical Journal,' Dec. 17; the 'Medical Times and Gazette,' Dec. 17; the 'Lancet,' Dec. 17; the 'Medical Press and Circular,' Dec. 21; 'Nature,' Dec. 15; the 'Chemical News,' Dec. 16; 'Journal of the Society of Arts,' Dec. 15; 'Gardeners' Chronicle,' Dec. 17; the 'Grocer,' Dec. 17; the 'English Mechanic,' Dec. 16; the 'Produce Markets Review,' Dec. 17; the 'New York Druggists' Circular' for December; the 'Chicago Pharmacist' for December; 'Chesterfield and North Derbyshire Almanack,' 1871; the 'Galway Vindicator,' Dec. 14.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[63.]—GREEN FLUID FOR SHOW-BOTTLES.—The following gives an emerald green:—

Cupri Nitrat. ℥iij
Acid. Muriat. ℥iv
Acid. Nitric. ℥iv
Aq. Destil. Cong. ij.
Misce sec. art. W. J. P., *Hawkhurst.*

[66.]—CEMENT FOR INDIA-RUBBER.—*M.* and *S.* send the following:—

India-rubber ʒj
Gutta Percha ʒiv
Bisulphide of Carbon ℥iv. M.

[68.]—POT POURRI.—In reply to "*Iodi*" (Sudbury), *H. B.* (Scarborough) sends the following:—

Gum Benzoin ℥ij
Cloves ℥j
Styrax Cal. ℥ss
Cort. Cinnam. ʒij
Rad. Iridis ℥j

Roughly powdered together, then add—

Musk ʒss
Bay Salt Hij
Ol. Lavand. gtt. xx.

Mix.

℞. Lavender Flowers 1 lb.
Yellow Sandal-wood 4 lb.
Cloves 2 lb.
Nutmegs 2 lb.
Orange Peel 2 lb.
Lemon Peel 2 lb.
Cumin Seeds 1 lb.
Cinnamon 2 lb.
Juniper Berries 2 lb.
Rose Leaves 2 lb.
Musk ℈j. G. HEYWARD, *Croydon.*

[74.]—TOILET VINEGAR.—In reply to "*Reciprocate*" I forward you the following recipe:—

Ol. Neroli,
" Cloves,
" Lemon,
" Bergamot,
" Cedrat, ana ʒj
Otto Rose gtt. xx
Gum Benzoin ʒv
Balsam Tolu ℈j
S. V. R. Oiij.

Digest for six days and add—

Acid. Acet. Glacial. ℥iss
Ess. Ambergris gtt. x
" Musk gtt. x.

After twenty-four hours, add aq. destill. ℥x and filter.—H.B., *Scarborough.*

[77.]—DISPENSING.—Can any of your readers inform me how I can dispense the following mixture so as the result shall be, without filtering, perfectly clear? It has been dispensed in London, and every time a clear mixture was sent out. I have dispensed it some twenty or thirty times, and it has always been milky?

℞. Acid. Phosph. Dil. B. P. ʒiij
Ferri Cit. c. Quin. ʒj
Tinct. Nucis Vomicæ ʒj
Sp. Chloroformi ʒij
Aq. Destill. ad ℥vj.

Ft. mist. One tablespoonful to be taken in half a wine-glass of water, at eleven and five.—"EXHIBEATUR."

In reply to "*Exhibeatur*" I give it as my opinion that it is not possible to prepare the prescription faithfully and procure a clear mixture without filtering. Experiments hastily made in the course of business show that on the addition of the acid. phosph. dil. to the solution of ferri cit. quin., a deposit of ferri phosph. is the result, and on further adding the other ingredients there is a deposit of quinia. I have tried Mr. Harwood's method of dispensing the prescription, and find that, as by any other method, a precipitate is slowly deposited. Such a mixture ought certainly not to be filtered. —"Ego."

[82.]—COLOURS FOR CARBOYS.—The following, like the green sent last week, do not contain more than a few grains of solid matter in the gallon:—

BLUE.

Liq. Fer. Perch. Fort. ♏x
Potass. Prus. Flav. gr. x
Acid. Oxalic. ℥ij
Aq. Cong. i, vel q.s.

RED.

Liq. Fer. Perch. Fort. ♏x
Potass. Sulphocyanid. gr. x
Aq. Cong. i, vel q.s.

H. P. Hearder, *Plymouth.*

CRIMSON.

Iodi,
Potassii Iodidi, ana ℨss
Acidi Hydrochlorici ℥j
Aquæ ad Cj. M.

GREEN.

Cupri Sulph. ℨj
Potass. Bichrom. ℨss
Liq. Amm. Fort. ℥ij
Aquæ ad Cj. Misce.

Tried and found good by T. W. C., *Holbeach.*

RED.

Liquid magenta dye q. s.

This is a good colour, stands well, and can be easily deepened by the addition of a little more magenta.—Pestle and Mortar.

In answer to *M.'s* inquiries as to the best way to prepare colours for bottles, I beg to say, if he wishes for a perfectly clear solution, his better plan is to use a weak spirit, say 30 U.P., made by mixing two gallons of ordinary alcohol with three gallons of distilled water; but if this is too expensive, then use distilled water alone and filter.

Crimson.—Make a strong decoction of red poppy petals, and with acid. sulph. dil. to the required shade.

Blue.—Cupri sulph. 2 parts; acid. sulph. 1 part.—G. B. Clarke, *Woburn.*

[93.]—OVER-PROOF SPIRIT.—The term *proof* spirit was originally applied to a spirit of such a strength that when gunpowder was wetted with it and the mixture lighted, the spirit, after it had burned away, fired the gunpowder,—if it failed to do this it was considered *under* proof. At the present time, however, the strength of spirit is known by the quantity of absolute alcohol it contains, as indicated by its specific gravity; the proof spirit now recognized by the Excise is of a sp. gr. ·920 and contains 57 per cent. by volume of real alcohol. And when a spirit of a certain strength is named, such as 56 or 60 degrees *over* proof, it means that to every 100 parts of such spirit, 56 or 60 parts of water are to be added to reduce it to proof strength.—J. H. Baldock, *S. Norwood.*

Proof spirit, sp. gr. 0·920 is the standard by which the strength of spirit of wine is regulated by law in this country; hence, if spirit of wine be *stronger* and therefore *lighter* than proof spirit, it is said to be so much per cent. "*over*-proof;" and if *weaker* and consequently *heavier*, so much per cent. "*under*-proof."

The sense in which the Excise use the term *per cent.* is somewhat peculiar and is as follows, viz.:—100 gallons of spirit of wine at 56 per cent. over-proof (*Spiritus rectificatus* P. B. sp. gr. 0·8382 at 60° F.), contain as much alcohol as 156 gallons of proof spirit, *i. e.* 100 gallons require to be reduced with distilled water to 156 gallons to form proof spirit; 100 volumes of spirit of wine at 54 O.P. are diluted with distilled water to 154 volumes; and 100 volumes at 60 O.P. are diluted to 160 volumes, to form proof spirit.

A spirit of wine stated to be 10 per cent. "*under*-proof" signifies that 100 volumes contain as much alcohol as 90 volumes of proof spirit, and 100 volumes of spirit of wine at 30 per cent. "*under*-proof" contain the same quantity of alcohol as 70 volumes of proof spirit and so on.

In making *Spiritus tenuior*, P.B., by mixing five pints of rectified spirit with three pints of distilled water and well stirring the mixture, eight pints of proof spirit is *not* produced, owing to the evolution of heat and contraction of the fluid.

This deficiency—of about 4 oz. in the gallon—is usually made up with distilled water, and must be borne in mind in preparing tinctures, etc., containing proof spirit. *Spiritus tenuior* should be kept ready prepared and the specific gravity always carefully tested.—J. Saunders Seaman.

[99.]—SHEET LIGHTNING.—"*Pestle and Mortar*" (Dorking) wishes for a recipe for making sheet lightning.

[100.]—TOOTHACHE TINCTURE.—"*A Leech*" would be glad of a recipe for a good toothache tincture.

[101.]—CHERRY TOOTH-PASTE.—*W. L. G.* (St. Austell) would feel obliged if some correspondent would give him a recipe for a good cherry tooth-paste.

[102.]—CIVET, AMBERGRIS AND CASTOR.—*F. C.* is desirous of knowing whence we derive our supplies of civet, ambergris and castor, and the quantities imported during 1869.

[103.]—SEA-SICKNESS.—*P. Q.* would feel obliged for a formula of a reliable remedy for sea-sickness, not chloral hydrate.

[104.]—COUGH PILLS.—"*Pendennis*" wishes for a good recipe for cough pills.

[105.]—BLACK MIXTURE.—Will any of your readers supply me with a formula for black mixture for scour in cattle?—*Pendennis.*

[106.]—*M. P. S.* would be glad to know if chloral. hyd. and chloralis anhydr. are the same, and whether both names are used.

[107.]—ADDRESS.—*R. H.* wishes for the address of Dr. Natali, an Italian physician, living at Twickenham in the beginning of the year 1869.

[108.]—SUKKAR-UL-AUSHAR.—"This is the name of the Manna or saccharine substance produced by *Calotropis procera*, or some other species allied to it, in Arabia and Persia, which was formerly imported into India; but it is not found at all now in any bazaar, nor is it ever produced here, as far as my knowledge extends, by any species of *Calotropis.*" So says the 'Supplement to the Indian Pharmacopœia,' but can any correspondent, at home or abroad, vouch for the existence of such a substance at all, from personal experience, and not from books? Has any one ever seen sugar or manna, or any saccharine substance, obtained from any species of *Calotropis* or believed to have been obtained from such a source? If so, what is it like? whence procurable? and is it any other than the nidus of an insect (*Coleoptera*) which frequents the *Calotropis*?—C.

[109.]—TAMARISK MANNA.—Many a time and oft it has been asserted in books that a species of *Tamarix* yields manna. It is said to be accurately described by Diodorus Siculus. Some say it is produced by an insect and is found near Sinai. Others allude to Persia, and others that it is obtained plentifully near Jhang, in the Punjab. Can any correspondent affirm, upon his own knowledge, that there is such a substance at all as Tamarisk manna? because I begin to doubt whether there is not some mistake, and whether any manna is produced on Tamarisks.—C.

[110.]—PATENT MEDICINES.—A table was published some years ago in one of the scientific journals, giving a comparison of the composition of various well-known medicines, protected by letters-patent, as obtained by actual analysis of a sample, with the composition as given by the inventor in his specification. I am desirous of finding this table.—R. B. P.

Correspondence.

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

Proposed Regulations for Storing of Poisons.

In regard to this subject there is evidently still almost as great a divergence between the position taken by the Council and that held by the country members as there was before the last election of Council took place. As far as present evidences go, there appears little prospect of an agreement being arrived at by the time the Annual Meeting comes round, at which the subject will be again debated,—and, it is earnestly to be desired, debated with better effect than at the meeting in May last.

Mr. Flux, at that meeting, said "he must confess there was, in his opinion, no danger of a *mandamus* being issued calling upon the Society to pass these regulations; but, whether the public would not consider that the clause did impose an obligation to pass some regulations, and that, refusing to pass any, the subject was remitted back to the public to be dealt with as Parliament might in its wisdom think best, was a matter for the consideration of the members." And the members at the meeting practically indicated their willingness to take the consequences of the rejection rather than submit to the regulations then proposed. If the Council have other and more urgent reasons for pushing the adoption of some regulations, the members do not appear to be made sufficiently aware of the fact.

A clear statement of the reason why some regulations must be adopted, and an evident desire on the part of the Committee and the Council to meet as far as possible the objections which were raised against the previous code, would do much to remove the objections which I have reason to believe are still strongly felt by many of my provincial brethren.

Comparing the code as at present proposed with that previously discussed, it is certainly altered for the better; but comparing it with the remarks which were made at the discussion in May and with the correspondence that has been published since that time, I think it might have been modified still further, both with advantage to its efficiency and to the prospect of its ultimate adoption.

The main objection to the former code was that it was impracticable to put restrictions upon the mode of keeping many of the less potent preparations of cantharides, belladonna, opium, etc.; that it was unreasonable to put them under the same regulations which were requisite for the safe custody of strychnine and hydrocyanic acid, and futile to expect good results from the use of any danger-signals which would be too common from their extension to the whole of the numerous list of legal poisons.

It may be that the Committee do not feel empowered to select a short list of very dangerous articles, which might be kept under stringent regulations; but, if so, we think they would do well to make it fully known that they have not the power of making two sets of regulations to apply to the first and second parts of the schedule respectively, or to classify poisons according to any other mode which might be more practicable for their safe keeping.

Perhaps the publication of the debates in Council upon the subject would show that these points have been fairly considered and for good reasons laid aside; but the Council must not wonder at the continued opposition of the country members, so long as they give them no evidence that their suggestions have met with consideration before being rejected.

In the Journal for July 9, 1870, Mr. Wilkinson rejoices that the immediate danger of vexatious restrictions has passed away, and concludes his letter by saying, "If we must have regulations on the subject, they should be confined to a few of the more deadly and dangerous poisons and their names specified."

In the Journal for September 17, 1870, I protest against making the poison regulations abortive by becoming too common, and suggest, as a means of avoiding this, that "All poisons intended for internal use as medicines, the usual adult dose of which is less than one drachm, shall bear a label immediately under the name of the article stating the usual adult dose; and upon such articles the usual adult dose of which is less than, say 5 grains, there shall be added the label 'Poison,' immediately under the label indicating the dose;" and add, that if a poison-cupboard or other additional precaution is deemed necessary, it should only apply to such poisons, the usual adult dose of which does not exceed 5 grains; thus liberating the tincture and wine of opium, etc., from the poison-cupboard, and liberating paregoric elixir and syrup of poppies from any restriction regarding their storage.

In the number for October 8, 1870, Mr. Buckett, while declaring his preference that we should restrict our efforts for securing public safety to the proper education of all who sell and dispense poisons, also says, "Keeping dangerous articles in one particular place, such as a cupboard, is a precaution which, I think, should never be neglected, though the articles so treated would depend, in some degree, upon the class of business done." There is thus evidently a willingness on the part of some of the opponents of the late code of regulations to accept an amended code, if it can be made such as they have suggested would be practically useful and not excessively burdensome; and while I would urge upon the Council to prepare for submission to the Annual Meeting such a code of regulations as would disarm their late opponents, I would also gladly see the country members extend yet a little further their willingness to submit to regulations which are probably more dreaded in anticipation than objectionable in actual practice; this, however, with the understanding that in the meantime the Council show satisfactory grounds for the opinion which they seem to hold, that it is necessary at the present time to add some further regulations to those inherent in the Act. And that they either submit a further amended code of regulations, obviating, as far as possible, the objectionable features which, I think, have been amply pointed out during the discussion of the subject, both at the meetings of the Society and in the pages of the Journal.

11, *Grey Street, Newcastle.* Barnard Proctor.

Sir,—It appears to me that this proposal is likely again to cause much ill-feeling in our Society, and will probably lead to a distinct fight upon the question at the next election. I think every well-wisher to the Society will be anxious to see this avoided. The question then arises, what steps can be adopted to avoid the scandal of a split among ourselves? Perhaps the first amendment moved at the Council Meeting by Messrs. Brown and Woolley, would command the adhesion of a majority of the Pharmaceutical and Registered Chemists; but certainly their second proposal, that of ascertaining the opinion of chemists throughout the country before taking action, would command almost universal support. What I would therefore propose is that every local secretary should at once ascertain the opinions of all chemists in his district and forward them to the Council. I am prepared so to act here, and would recommend, where the local secretary declines to act, that some other member or registered chemist does the work. The feeling of all could be thus obtained in a few days, and would, no doubt, determine the action of the Council.

T. W. Gissing, *Local Secretary.*

Wakefield, Dec. 17*th*, 1870.

Sir,—The Chairman at the last Annual Meeting, in his opening remarks upon the question of "Poison Regulations," used the following words:—"I fail to gather from all the protests which have been sent up, any more logical objection to them than that of perhaps a natural dislike to being compelled to submit to any special code." Does it not strike the reason of any intelligent person that the real repugnance to these absurd regulations is based upon the most logical grounds possible, and is but the natural expression of minds possessing just appreciation of their own intelligence and responsibility?

Allow me to put a parallel case and to ask what would be the feeling of a gentleman, after receiving a good education, walking the hospital, going through the usual examinations and who in due course received his diploma authorizing him to practise,—were the same authorizing body to come to him and say, "Now, Sir, you have passed our examinations, you are fully qualified to practise, but before you do so, we must remind you that you must conform to our regulations as to the place and manner of keeping your knives and lancets, lest you should by mistake use the wrong one. You must also have each of those instruments distinctly engraved 'dangerous,' lest you should by chance forget the fact." What, I ask, would that gentleman say? what would he feel? Methinks I see the smile of sarcastic scorn with which he would view his interrogator, while with difficulty he restrains the utterance of an epithet not over-complimentary. Would his objection be logical? Would not his indignation be pardonable as well as reasonable?

I venture to think this is very much the position into which our Council seeks to put us by adhering to these would-be "Poison Regulations," over which we had so warm a discussion at the last Annual Meeting, the amended form of which you have published in this week's Journal. I grieve, as I look through the names of the gentlemen who felt it their duty (certainly not in the interests of their electors) to oppose the amendments moved by Messrs. Brown and Woolley, to see those whose judgment in most cases we dare not question, who yet, under the mistaken idea that because the Council at the time of the passing of the Pharmacy Bill thought proper to make certain unwise engagements, therefore the present Council is bound to endorse and to carry out those engagements, notwithstanding the universal expression of dissent by the whole body of independent chemists throughout the length and breadth of the land. Should the Council persist in enforcing these regulations, it will be our bounden duty to rise *en masse* against so unjustifiable an act.

The reluctance of the Council to solicit a cool expression of feeling on the part of the trade, which would have been the result of adopting Mr. Woolley's second amendment, reminds one irresistibly of the similar feeling manifested by our neighbours across the Channel; is it possible a similar feeling of distrust in their own position actuates both parties? If so, let our friends at Bloomsbury Square be wise and face the difficulty and act upon the verdict returned, and they will have no cause to regret the step; but supported by the unanimous voice of the trade, they will be in a position to explain to the Privy Council the impracticability of carrying out such measures, and further to show that the present educational standard required by law is a far more powerful safeguard than any penal enactment could possibly produce. On the other hand, should these gentlemen, forgetting their representative position, still consider themselves pledged to Government to carry out these regulations, then in the face of an adverse vote but one constitutional act remains open to them.

No one would regret more than myself any repetition of the excitement exhibited at our last Annual Meeting upon this question, but unless the Council will be wise in time, I fear the result will be inevitable, for assuredly the trade at large will not quietly submit to be thus unnecessarily saddled with a burden which neither the promoters nor ourselves could carry.

Two modes of action present themselves at the present crisis. The first rests with the Council itself, viz., the adoption of Mr. Woolley's motion at the next meeting of the Council to the effect "That it is desirable to obtain an expression of opinion from chemists throughout the country whether regulations for the keeping of poisons are desirable or not; the same to be obtained by circulars issued by the Secretary of the Society." The second would then be unnecessary; but in the event of the Council again rejecting it, I venture to suggest that the trade would be compelled in self-defence to take the matter into its own hands, and forthwith have petitions against the regulations signed in every town and duly forwarded to the Council. For many reasons the former would be far preferable, eminently so, as it would at once prevent the unnecessary excitement which must otherwise arise.

The one would be an act of becoming grace, the other an act of hostile necessity. EDWIN B. VIZER.

63, Lupus Street, Belgravia South,
December 19th, 1870.

Sir,—I had a slight hope, but not much expectation, that the discussion in the Council on the 7th instant would have produced a different result, and that we should hear no more of compulsory regulations; but the majority seem determined, if possible, to force them upon us. They certainly cannot be aware of the full scope and effect of the proposed measure, or they would not be so desirous of enforcing its adoption.

I do not hesitate to say that if the "Regulations" last proposed become law, every chemist and druggist in the country will be at the mercy of the Privy Council, and liable at any time to be struck off the Register, and compelled to discontinue his business if he fail to observe them. The first clause in the Pharmacy Act says, "It shall be unlawful for any person to sell or keep open shop for retailing poisons, or to use the title of Chemist and Druggist, unless registered under the Act, and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council."

Clause 15 says, "Any person who shall fail to conform to any regulation as to the keeping or selling of poisons made in pursuance of this Act, shall be liable to a penalty of £5."

Clause 26 says, "The Privy Council may direct the name of any person who is convicted of any offence against this Act, which, in their opinion, renders him unfit to be on the Register under this Act, to be erased from such Register, and it shall be the duty of the Registrar to erase the same accordingly." It is hardly credible that any one seeing the effects of these provisions would voluntarily subject himself to such a liability, yet that is what our Council propose to do for themselves and us.

We have been told that the Council are bound by the Act to make "regulations," but that I deny. The Act nowhere says that the Council shall make regulations, but it speaks of regulations that may "be prescribed by the Pharmaceutical Society." Now the word "may" is only used in the Act some six or seven times altogether, and in every other case in a permissive sense only, giving power to do something that may be necessary or desirable, but certainly not directing the thing to be done; surely if this be so, we have every right to conclude the word to be permissive in this instance likewise. But granting the intention to have been that the Society should prescribe regulations, I contend that it is the duty of the Council to strongly resist any Governmental pressure on the subject, and firmly refuse to submit either themselves or their constituents to a burden which they alone, of all the dealers in poisons, are required to bear.

The threat that, if we do not frame regulations, the Privy Council will do it for us, does not alarm me in the least. They have not the power to do so; a new Act of Parliament would be required for the purpose; and does any one imagine it possible to pass an Act that shall apply to chemists and druggists only, and leave every other dispenser of poisons to keep them in any way he thinks proper? If compulsory regulations are made at all, they must apply to every dispenser of poisons and not to us alone.

There is not a doubt that you have correctly estimated the terms of Mr. Hampson's letter, and that "open war and determined resistance to the action of the Council" is intended; if the Council will not fight our battle in this matter, we must fight the Council, and I have no fear that "the real interests of Pharmacy, as a craft," will either "be lost sight of or damaged" in the contest.

W. WILKINSON.

Cheetham Hill, December 19th, 1870.

Sir,—The majority of the Council has elaborated a new edition of the 'Poison Regulations,' which it intends to propose for adoption at the next Annual Meeting, and we have now before us the prospect of a renewal of last year's contest.

It is much to be hoped that the leaders of the opposition will on this occasion take stronger ground, and contend boldly—that all such regulations, however wide their terms, are objectionable in view of the consequences which must follow their adoption in a compulsory form; if it is not to be a mischievous sham—both a snare for ourselves and a delusion for the public—that no sufficient proof of their necessity in the past has been afforded, and that they must, under existing circumstances, become daily less necessary. Their warmest advocates recommend them only on the ground of expedience. Holding before our eyes the bugbear of the Privy Council, "We know," say they in effect, "the dose is nauseous; but swallow it now with a good grace, lest by-and-by you get one still more unpleasant." The valour of these gentlemen is too largely tempered with discretion. If we are true to ourselves, and act in concert, we have little to fear; but even should their most terrible prognostications prove well-founded, it will be better to suffer what we cannot avoid, after a manful resistance, than commit the absurdity of fashioning a yoke for our own shoulders, leaving free those of the whole body of general practitioners, which has, in truth, far more to answer for than ourselves.

Hampstead, Dec. 19*th*, 1870. CHARLES EVE.

Sir,—I rejoice to find that we are at last likely to obtain a settlement of this troublesome question, the Council having at their last meeting decided upon some simple regulations which they will propose for the adoption of the next Annual Meeting of the Pharmaceutical Society in May. The last Annual Meeting remitted this subject to their continued attention. We may rest assured that a Council elected so popularly as the present, and composed of good and trusted elements, will not have based their present conclusions upon rash or unconsidered grounds, and it is satisfactory to find that they were confirmed by a large majority of the Council.

Nevertheless, a note of war comes from Manchester! We may possibly expect another blast from Leeds. These cheerful notes will be useful in keeping the question warm until the opportunity of settling it comes. In the meantime let us hope that the several members of the great constituency in whose hands the decision rests, will be wise,—will not allow their judgment to be influenced by prejudice or partisanship, but will calmly and reasonably weigh the proposal the Council has made with so much care and deliberation.

That the chemists of Great Britain must submit to some regulations for the storage of poisons is not to be doubted. Those who are acquainted with the history of the Pharmacy Act of 1868 know that it was not only first named a Poison Act, but that no Bill would have been submitted to Parliament at that time but for the acknowledged necessity of observing further precautions in the use and keeping of poisons. The opportunity was adroitly taken to introduce into the measure security for the higher education of chemists, as one of the means supposed to promote the object in view. The gain to pharmacy was, and will yet be, immense. But that the primary object was the protection of the public from accidental and other poisoning, there cannot be a doubt.

The Act, however, was confessedly incomplete without additional precautions for the safe keeping of poisons; and the Privy Council, therefore, discreetly determined to lay upon the Pharmaceutical Society the obligation to provide such regulations as experience of the exigencies of the trade suggested. The Privy Council, urged on by constant articles in the public and medical journals, do now impress upon the Pharmaceutical Council very strongly the necessity for its action. The cry for some regulations has waxed so strong, that the Privy Council may propose some Bill to Parliament, should the present proposal be rejected, and that Bill might be most objectionable to us. The Council of the Pharmaceutical Society have, therefore, only performed a public duty, imposed upon them alike by honour and interest in conforming to these various demands.

In spite, however, of these obligations, the glorious liberty of the Englishman to do as he pleases with his own, is so strong in the chemist, that certain of them are prepared to defy Councils, National, Privy and Pharmaceutical, in order to maintain his unrestricted liberty with his poisons. It is, however, a fact that, to the limitations of law, we owe our truest freedom; and, in the observance of restraint, we find our highest interests and happiness. In this case, moreover, the chemist is the defendant; the Government and the public are the plaintiffs. It is surely in the interest of the defendant, that he should, whilst the golden opportunity lasts, make his own regulations.

The amended regulations which the Council now propose are extremely simple and will inconvenience nobody. It is admitted that most chemists in Great Britain already observe these regulations in one or other of their forms,—and thus testify that such regulations are necessary and practical in their character. The non-observers are those who seldom dispense a prescription at all, but vend a motley variety of medicines and drysalteries, in which pills, paint, cream of tartar, arsenic, sweets and laudanum are the representatives. If ever there was any class of men who ought to be subject to poison regulations, it is this. Yet even to them, the proposed poison regulations have no sting. They may, if they like, keep their cask of arsenic in one corner, secured with a padlock on the cover. They may keep their carboy of laudanum under the counter in another place, but capped with leather, or distinguished by some other sign; and all their choice and other deadly poisons—strychnine, aconitine, morphine and what not else—on some special shelf or division in the shop, and thus fulfil, without inconvenience, the regulations proposed.

One much paraded objection to any regulation is that it would necessitate the appointment of inspectors to enforce its observance. The idea is chimerical, were the regulations left to the Council of the Pharmaceutical Society; but possible, if enforced by special Act of Parliament.

The observance of approved regulations in the keeping of dangerous poisons would have this value, that their careful observance would, in the eye of the law, constitute a strong claim to favourable consideration in case of accident. It would also afford to the chemist a sense of security and satisfaction in the conduct of his business which he does not now possess. And as to the argument that any regulations are unfair which do not equally touch the dispensing surgeon and apothecary, this beneficial result would follow its partial application, viz. he that takes the physic would do so with much greater security if it were compounded by the chemist, than if it were made by the apothecary who observes no precaution in the protection of his clients from accident.

A PHARMACEUTICAL CHEMIST.

(For the proposed Poison Regulations, see PHARMACEUTICAL JOURNAL, Dec. 17th, p. 491.)

A POINT OF ETHICS.

Sir,—In answer to *two* of your correspondents, relative to the prescription dispensed by "Magnesia," No. 22, p. 437, allow me to say that I do know that "quinine" undissolved is "*not so*" bitter as in "solution," and frequently ordered so by medical men to their patients, but in the prescription alluded to the deposit was something more than "undissolved quinine," and, perhaps, more nauseous to a weak stomach. I still maintain the medical man in this instance forgot to add ac. sulph. dil. gtt. xij, having so frequently compounded nearly the *identical* prescription not only for *one person* but *several.*

I would ask your correspondent, D. T. W., of Bath, who thinks that medical men are "not so forgetful" as I wish to make them, what he thinks of the enclosed prescriptions that have come under my notice from "eminent medical men," and whether he would have compounded them (as they are written), or used his discretion and acted up to the best of his knowledge?—

℞. Morph. Mur. gr. i
Ext. Hyoscyam. gr. xij
Ft. Pil. h. s. s.

℞. Hydrarg. Bichlorid. gr. xviij.
Divid. in chart. xij, cap. i ter in dies.

Those are not solitary cases; truly they do require looking after as well as chemists.

Liverpool, Dec. 17*th*, 1870. CHEMICUS.

LIMITS OF THE MEDICINE STAMP DUTIES ACT.

Sir,—Having to prepare a bottle of "quinine wine" for a customer, I went to a respectable confectioner's for "orange wine;" it was old and not at all palatable. I did not purchase; he then recollected he had just received a case of "quinine wine," and opened it for me. On reading the label and enclosed handbill, I advised him not to sell any until I had written to Somerset House, as my notion was that it would require a stamp, and make it necessary that he should take out a Patent Medicine Licence. I this day received a very courteous reply, stating that quinine wine is not regarded as medicine within the meaning of the Medicine Stamp Duty Acts, etc.

Sheffield, Dec. 14*th*, 1870. HENRY HORNCASTLE.

THE PHARMACY ACT.

Sir,—I wish to inquire, through the medium of your Journal whether the Council of the "Pharmaceutical Society" have not acted contrary to the full meaning of the 'Pharmacy Act' in refusing to admit me as a member? What is the limit of the discretionary power, and are they not bound to a *just* reason for their decision?

ELIZABETH LEECH, *Registered Chemist and Druggist.*
Elm Villa, Broadwater, Worthing, Dec. 17*th*, 1870.

The Alleged Exorbitant Charge for Dispensing.

Sir,—I have been waiting to see if the editor of the *Lancet*, in answer to your letter of the 30th ult., would "make more fully known the facts of the particular overcharge" which led to this discussion. His only reply is a foot-note, which says, "our correspondent merely relates a fact regarding the conduct of an individual." The public and the daily press have, however, taken this to be a sample of the "extortionate charges" of chemists generally, and we have cut a very sorry figure indeed when compared with "lawyers, horsedealers and brigands." But as the *Lancet* deigns to give you no explanation, I now venture to inform you that the "druggist" who charged 24*s.* for 36 oz. of mixture, as narrated by "Prescriber," is a medical practitioner keeping an open shop. Comment is distasteful and unnecessary, but we may fairly complain that our reputation as a class has been damaged by an anonymous communication, and all discussion on the merits of the case stifled. The letter was written no doubt *bonâ fide*, but an important fact was unwittingly omitted, and the result is an injury which cannot be repaired. I venture to say that no chemist in the kingdom would charge more than 2*s.* for this particular 6 oz. mixture; the more universal price at shops of the highest respectability would be 1*s.* 6*d.*, and this fact may be gathered from "Prescriber's" own words. Having written thus much, my authority may be demanded, and it may, perhaps, save time if I say that the prescription was brought to me, and the price I quoted was 1*s.* 6*d.*; the bill complained of was afterwards put into my hands, and, I believe, that I characterized the charge as very exceptionally high and excessive.

Wigmore Street, Dec. 19*th*, 1870. Wm. Matthews.

Remedy for the Toothache.

Sir,—In the Journal of the 10th, page 466, you recommend carbolic acid to be applied to the inside of the tooth when the nerve is exposed. May I be allowed to suggest, as an efficient improvement and addition, which I have found very efficacious? viz. equal parts of collodion and Calvert's acid. carbolic. applied to the part affected, say twice a week, after nervous sensibility has ceased, then mastic and chloroform applied afterwards on cotton wool, have given permanent relief.

Sudbury, Dec. 17*th*, 1870. J. Barker.

Druggists' Charges.

Sir,—Druggists' charges have been a topic for some time, and although many letters have appeared, it does not seem that they have led to any definite result.

Several of your correspondents have complained of the cutting system carried on in some neighbourhoods, and naturally ask what is to be done to prevent such practice. They say prescriptions are frequently handed to them by persons to know the price, who, when informed on that point, reply that your neighbour Mr. So-and-so made it up for half the amount. I have had a good many years' experience in some of the first-class dispensing establishments, both in London and country, and have frequently experienced remarks of the same kind, and have, on many occasions, found that such statements were not correct. The remedy in a case of dispute is simple. First read the prescription, then state the cost, and, if disputed, don't give way, but leave the option in the hand of the customer. If informed that some other house has compounded it at a much lower price, advise that it be taken there. As to the truth of such a statement, you can judge from the respectability of the house. If it be one of any standing, it will be incorrect; if not, don't waste time by saying that drugs supplied there cannot be of the same genuine character that we use. If this system be carried out, it will, I believe, go far towards putting down the indiscriminate and mean practice of cutting. It is well known that a cutting house does not compound many prescriptions, in fact but few, for confidence is lost, and it is often found that a prescription comes back to the house from which, on account of charge, it had been taken. This I have several times experienced. As regards fixing prices for dispensing with a view to uniformity, it cannot be done, for physicians do not prescribe alike; some write very simple and inexpensive prescriptions, with eight doses in the eight-ounce bottle, then the usual charge will answer. Others, however, write for sixteen doses, while the ingredients are more costly. In these cases discretion and prudence must be exercised. Pepsine, quinine and other expensive drugs may be in large proportion, consequently the charge must be according.

The leading dispensing establishments, both in town and country, have prices which almost correspond, and, taking a conscientious view of such prices, I don't think they will be found at all exorbitant. Good houses are particular in having experienced hands that can do their work well, paying them good salaries in return, and are most careful that the drugs used are pure and genuine, consequently they ought to have a fair price for strictly carrying out their duties.

In Mr. Robert Howden's very elaborate paper, published in the Journal of Saturday last, we are informed of the prices obtained in the United States for dispensing; there the pharmacist generally charges about sixpence an ounce for medicines, that is, three shillings for a six-ounce mixture. These prices are considerably above ours, why should such be the case? Is pharmacy more of a profession there than in England? In Ireland the apothecaries' prices are also above ours; but I don't think the same complaints are heard there as we hear in London and the English provinces. In conclusion, I would beg to suggest that upon no account ought one pharmacist cut below another in dispensing prices. Let us try and follow each other as much as possible. This could easily be done by having one recognized private mark, and let the first house which compounds a prescription mark the price accordingly, and let all others who receive it afterfollow that price. This system is adopted by several good houses, and is found to be of great service when the mark is known. Some use the words "Mel Boracis," others some other term; but if we had one special mark to work from, the effect would be most beneficial. It would put a stop to the impositions which we so often find customers attempting.

Newcastle, Dec. 14*th*, 1870. John Dowling Allman.

Spiritus Ætheris Nitrosi.

Sir,—In the report of the Transactions of the Liverpool Chemists' Association, appearing in the Journal of the 10th instant, in the discussion upon Spiritus Ætheris Nitrosi, I am reported to have said, "I could not understand why a concentrated solution could not be made;" such a remark I did not make, and it is evidently a misunderstanding on the part of the Secretary taking his notes. On the contrary, I condemned the practice of wholesale houses supplying the article, not only because I found it impossible to obtain a solution, containing 80 per cent. of pure nitrous ether (which would be the required strength), but also, because it is impossible to keep a concentrated solution without its soon becoming strongly acid.

Absence from town precluded the possibility of my correcting the error at our last meeting, I shall therefore be glad if you will insert this in your next issue.

Dec. 14*th*, 1870. G. J. Rawland.

Information Wanted.

Sir,—I have received to-day a prescription with the following article in it—

Mag. Ferri et Quin. Sulph. ℥iss.

The above was written very distinctly, and had been obtained at Messrs. Hitchcocks, of Oxford; perhaps they, through your columns, would give some information as to the composition of the article. E. B.

L. V. D.—Persons passing the Modified Examination are not entitled to call themselves, or be addressed as, Pharmaceutical Chemists. Registered Chemists and Druggists may open as many branch establishments of their business as they please.

R. Hall (Camborne).—They may be obtained of any scientific instrument maker.

Pharmaceutical Chemist (Northampton), *W. R.* (Scarborough), *M. P. S.* (Southport), *Res Facta* (Bristol), are referred to the rule respecting anonymous communications.

E. Smith (Torquay).—Arrangements are being made for the issue of cases; we hope to be able to publish the details in our next number.

In consequence of press of matter, we are obliged to omit answers to several correspondents.

Communications, Letters, etc., have been received from Mr. H. Machon (Saffron Walden), Mr. J. B. Leslie (Sheffield), Mr. Barker (Sudbury), Mr. Malcham (Sheffield), Mr. H. Flint (Cork), Mr. Gregory (Stockton-on-Tees), Mr. Collier (Sheffield Moor), Mr. W. A. Thirlby, Mr. Fairlie (Glasgow), W. M. (Ramsgate), W. L. G. (St. Austell), A. (Carlisle), S. D. Q., "Grey Hairs," "Aliquis," "Kapha," "Nemo."

THE TRADE IN LEECHES.

BY P. L. SIMMONDS.

Although the commerce in leeches in this country has largely declined of late years, yet the demand elsewhere for this small red-blooded aquatic worm is so great as to afford employment to a considerable number of persons in breeding, catching, and selling them. France, which used to be the great emporium for much of the trade, has, within the last few months, had weightier matters to attend to than the collection and transit of leeches. Hence some few particulars and statistics of the trade, as it did exist, may not be without interest at the present time.

Among the works which I have consulted may be named 'Monographie des Hirudinées,' par Moquin-Tandon; 'Monographie des Sangsues Médicinales,' par Ch. Fermond, 508 pp., Baillière, Paris, 1854; 'Mémoire sur l'Hirudiniculture,' par A. Ph. Laurens, 1854; 'Nouvelle Monographie des Sangsues Médicinales,' par Dr. Ebrard, 494 pp., Paris, Baillière, 1857; 'Le Guide pratique des Éleveurs de Sangsues,' par L. Vayson; 'La Production des Sangsues,' par Jourdin: Paris, Hachette et Cie.

The commerce in leeches may be looked at in different points of view, as the sale, properly so called, the importation, export, nature of the commercial species sold, their price, falsification and transport, but full descriptions on all these would take up too much detail. Fermond enumerates seven varieties of the medicinal leech; so does Dr. Letheby. It is not necessary to give the specific details of these here. In this country only two kinds are usually reckoned fit for medicinal purposes, viz. the brown leech and the green leech; the former found sparingly in Great Britain, but abundantly in northern and central Europe. Dr. Letheby says the *Sanguisuga* may be known by one or both of two characters: they have a continuous longitudinal stripe of a yellow or orange colour along each margin or side of the body; and secondly, when the abdomen is of a lighter tint there should always be two lateral black stripes, one running down on either side. Every leech that does not present these, which may be called generic characters, should be rejected.

A communication to the Société Zoologique d'Acclimatation of Paris made known the existence in America of leeches possessing this valuable property, that they leave no mark on the skin to which they are applied, so that they must act not by biting but by suction. This curious fact is put beyond a doubt by the experiments made upon himself by Craveri, a learned Italian. M. de Filippi has placed these leeches in a new genus, which he terms *Hæmentaria*, and of which he describes three species, two belonging to Mexico and one to the river Amazon.

The following is the annual declared value of the leeches imported into this country in the last seventeen years. Formerly the largest quantity came from Hamburg, but of late years nearly all the imports were from France:—

1853	£27,068	1862	£9,455
1854	17,238	1863	12,393
1855	16,477	1864	9,028
1856	12,926	1865	13,314
1857	10,011	1866	12,866
1858	11,604	1867	8,999
1859	11,919	1868	8,876
1860	11,857	1869	7,067
1861	11,175		

This is the foreign import, and exclusive of any home supply obtained. It is difficult to arrive at numbers in such an article, but the value must represent at least two million leeches annually; indeed, some years ago it was stated that seven or eight millions were annually imported.

From official figures we find that the import of leeches into France annually from 1827 to 1836 was 34,050,682; and from 1837 to 1846, 18,538,041. The largest quantity was 57,491,000 in 1832; the official value of these being stated at 1,724,730 francs. In subsequent years the imports were greatly reduced, as the following figures will show:—

1847	11,790,840
1848	9,903,398
1849	11,112,000
1850	11,766,000
1851	13,058,500
1852	10,415,000

Adding the home collection and those fraudulently imported, the leeches annually employed in France may be taken at 30 millions; and many of these serve for use several times. According to L. Busquet, these 30 millions are differently made up, and he considers the largest portion are furnished from the native marshes. In 1851 (he states) we received 13,058,500 and exported 5,731,000, and therefore, of the imports 7,327,500 were retained for consumption; and as 30 millions are used, the home supply must have been 22,672,500 leeches, of which about a third were furnished by the department of the Gironde. France is now obliged to seek leeches from the adjacent countries, Switzerland, Belgium, the Sardinian States and Greece. Spain and Portugal, which used to export, are now obliged to draw supplies from abroad. It is the same in Italy. Tuscany exports some leeches, but they are considered of an inferior quality. Bohemia, which used to furnish supplies, now possesses only exhausted marshes. Hungary, so rich in leech morasses, commences to be impoverished of the kinds which the dealers used to send as far as the frontiers of Russia and Turkey, Poland and other countries in the north of Europe. Great Britain, which used to be rich in leeches, is now forced to draw supplies from France, Germany, and Portugal. It is by Bordeaux, Stettin, Hamburg and Lisbon that these supplies are drawn. Hamburg and Stettin each send about 150,000 per month.

Turkey still supplies leeches. In 1845 the shipments from Constantinople were 120 tubs; in 1846, 189; and in 1847, 108. In 1857, 475 packages and cases of leeches, valued at 287,000 piastres, were shipped from Smyrna.

The price has varied greatly in France. For fifty years, according to Fée ('Cours d'Histoire Naturelle'), they were sold at 12 to 15 francs the thousand; in 1815 they were double that price, and they gradually advanced to 150 and 200 francs. In 1849 and 1850 the hospitals at Paris bought them at 160 francs the thousand, but in 1851 the price rose to 240 francs. The price varies according to the size, quality and season. In 1854 it ranged from 150 to 190 francs the thousand. If with Vayson we take the mean price at 200 francs the thousand, we arrive at the gross annual value of £240,000 for leeches in France. The wholesale merchants will not, however, admit that the sum is so large.

Leeches are found to a great extent in the lakes of the north-west district of Morocco, called the Ghaib. They are shipped in the first instance to Gibraltar. In 1839 about 4 or 5 million leeches, valued at nearly £6000 sterling, were shipped from Morocco; and in the same year, from Tunis to France, leeches valued at 106,000 piastres. In 1843 their value seems to have greatly increased, for in that year 611,000 leeches (valued at £4889) were sent to England from Morocco, and 809,000, value £6358, to other countries. The quantity annually shipped from Tangier is said to be from 15 to 18 millions. Spain and France receive the greater part. The leech fisheries of Kaissaireh and other parts of the empire of Morocco are annually disposed of by the Government to the highest bidder. The right to collect leeches in these marshes was at first obtained for a few hundred pounds, but now purchasers pay heavily for the privilege. In 1856, £14,000 was paid for the monopoly of the collection and export.

Sixteen to seventeen thousand pounds' weight of leeches are obtained there annually. There was long a prejudice in France against the leeches of Algeria, as they were placed in the category of dragon-leeches, which were excluded by law from being used in the civil hospitals of France. The result, however, of experiments made in Algeria by order of Marshal Vaillant, and subsequently repeated in France under the eyes of many members of the Academy of Sciences, has fully established the fact that the African leeches are fully equal to any obtained in Europe, and therefore for the home supply of France recourse need not be had to the marshes of Turkey and Hungary. They are to be found plentiful in the marshes of Taguin, between Boghas and Traret, and a large commerce might be carried on in them with profit. Indeed, in the year 1865, 1,207,000 leeches were shipped from Algeria, of which 379,000, value £1516, came from Stora, Philippeville, and 11,923 from Bona.

The rearing of leeches in great natural marshes, or in marshes artificially made, forms an important branch of rural economy in France. M. Béchade, a farmer in the neighbourhood of Bordeaux, became a millionaire by transforming poor marshes, for which he could hardly pay a rent of 300 francs, into magnificent enclosures for leeches, now let for 25,000 francs. M. Jourdin ('La Pisciculture et la Production des Sangsues') refers to a Parisian capitalist who embarked in this species of industry, with the satisfactory result of a revenue of 15 for 1, that is to say, a leech which cost 25 centimes produced on an average 15 leeches a year, which could be sold at the same price, or, say 3 francs. Deducting at the most 5 centimes for expenses, there remains a gain of 2 francs 25 centimes when the operation is on a large scale. It is therefore credible that a marsh of 48 hectares should let for 25,000 francs, and that enormous fortunes should have been made by this new species of rural economy, which is alike useful to the public and beneficial to the private interest of those by whom it is prosecuted.

Lord Desart lately let a piece of marsh land of about 40 acres on his estate near Callan, Wexford, to a company of Frenchmen, who immediately fenced it in, and, having freely irrigated it from an adjoining stream, proceeded to sow it down under a leech crop. The "seed," if we may so express it, was contained in sacks, each holding 15,000 leeches, which were scattered from the hand just as corn is sown. Formerly, after becoming apathetic from use, leeches were thrown away, and new ones procured at a considerable cost; now, however, when no longer fit to be used, they are planted in beds in the rivers and ponds of France, and, being properly fed, soon resume their activity, and furnish the most beautiful cocoons.

Leeches abound in India and Ceylon, and we may yet get them even from those distant quarters. Dr. Carter read a paper some years ago before the Bombay Medical and Physical Society on the leeches of western India, in which he alluded to the Matheran, a terrestrial leech, the common leech being aquatic. This Matheran leech is about three-quarters of an inch long and of a reddish-brown colour, has a black line down its back, is covered with black spots, and has ten eyes arranged in a circle, with a smooth lip. The common leech, on the contrary, is olive-green in colour, has seven lines down the back, twelve eyes arranged quadrilaterally, and an uneven notched lip.

In Ceylon, where the varieties of leeches are more numerous than in any part of the world, the propagation of the sort used in phlebotomy is made a secret. In India, also, the leech propagators do all they can to keep the knowledge to themselves. Major Blenkinson, a good naturalist, succeeded, however, in propagating them in Scinde, to the great economy of Government in supplying the hospitals. Mr. J. Sparkes describes the plan, PHARMACEUTICAL JOURNAL, Vol. VI. p. 259.

Dr. Hooker, in his 'Himalayan Journal,' says that he found leeches swarmed in incredible profusion in the streams and damp grass and among the bushes. "They got into my hair (he adds), hung on my eyelids, and crawled up my legs and down my back. I repeatedly took upwards of a hundred from my legs, where the small ones used to collect in clusters on the instep. The sores which they produced were not healed for five months afterwards, and I retain the scars to the present day."

INTRODUCTION OF MAIZE INTO CHINA;*

(INDIAN CORN, *Zea Mays*, L.)

BY H. F. HANCE, PH.D., ETC., AND W. F. MAYERS, ESQ., F.R.G.S.

With Notices of the Plant by Chinese Authors.

In the summer of 1858, and therefore shortly before the collections of Mr. Charles Wright had furnished the text for Asa Gray's celebrated essay on the connection of the Japanese and Eastern-American Floras, the venerable Professor von Martius, of Munich, in a letter on the relations of the Asiatic and American continents, directed my attention to the inquiry whether there was any extant evidence of maize being a true native of Japan, adding that Siebold had stated it to be delineated in the arms of that empire.

At that time Japan was just emerging from the position of a *terra clausa;* no very comprehensive idea of the precise character of its flora and its connection with that of other countries, based on modern researches, was attainable, and, save a stray specimen here and there, its vegetable productions scarcely existed in herbaria except amongst the rich and unarranged treasures of the Leyden Museum. The

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* Read before a meeting of the Linnean Society.

query excited my interest at the time, but partly from Thunberg noting under *Zea Mays* (Fl. Japon. 37), "Colitur prope Nagasaki, a Chinensibus forsan primum in regnum hocce illata," and partly owing to the incongruity which attached in my mind to the notion of armorial bearings amongst the Japanese,—though we now know that these exist, and that the feudal retainers of the powerful chieftains wear their badges precisely as did those of the mediæval barons,—the subject soon escaped my memory. Some months back, however, my attention was attracted by an advertisement in the London seedsmen's catalogues of a striped-leaved form, alleged to have been introduced from Japan, of *Zea Curagua*, a Chilian species (and probably the only other one of its genus) described about eighty years ago by Molina; but on what evidence a Japanese origin is assigned to this variety I have no means of ascertaining. About the same time also Mr. A. Ernst, of Caracas, wrote to me, requesting that I would, if possible, ascertain when maize was first known in this country.

In the 'Géographie Botanique' of M. Alph. de Candolle (ii. 942 *sqq.*) the distinguished author has given a very complete *résumé* of what was known respecting the introduction of this cereal, and, after a careful and lucid examination of all the data, has expressed his unhesitating conviction that it was brought from America, though from what part of that continent he considers very doubtful, inclining, however, rather in favour of Mexico. He expresses, moreover, a desire that reliable investigations should be made as to Bonafous' suspicion, that the grain was cultivated in China prior to the discovery of America,

The question whether, in common with *Phryma leptostachya, Panax quinquefolium, Tipularia discolor*, and some other plants, maize may claim Asia equally with America as its native country; or, failing probable grounds for such an opinion, whether trustworthy printed evidence exists of its cultivation in Asia antecedent to the second discovery of the great American continent at the close of the fifteenth century,—is evidently of the highest interest; and the Chinese nation boasting a rich historical literature, and in matters of antiquity having perhaps a right to look on Western records much as the Saïtic priests are represented in the Timæus to have regarded those of the Greeks, I felt convinced that the examination of native works, the statements in which relative to the sciences of observation have commanded the respect of such men as Arago, Humboldt and Biot, could not be wholly unproductive. I am not myself a Chinese scholar, but was so fortunate as to enlist in this inquiry the services of my friend Mr. W. F. Mayers, H.B.M. vice-consul at Canton, one of the most accomplished and learned of sinologues, and who besides enjoys exceptional advantages from being on amicable terms with all the high native officials at the southern capital. This gentleman had the kindness, at my request, to make inquiries of his Chinese literary acquaintances, and to undertake and execute himself a thorough examination of all the works treating of maize to which he could procure access, and the results are embodied in the accompanying memoir, the interest and value of which, as a contribution to the history of plants, all botanists will acknowledge. It was, through the writer's liberality, freely placed at my disposal, and is here given without a single alteration.

I am far from maintaining that the evidence adduced is sufficient to establish the claims of Asia to rank as a native country of this cereal. But, for my own part, I am much disposed to coincide in a remark made to me by Mr. Mayers, "that the unhesitating statement of the Pun Ts'ao, as to its origin in the countries west of China, goes a considerable way towards establishing this origin, the assertion being so unqualified that I think it must be founded on antecedent evidence, although this is now untraceable." And I may add that, in my judgment, the remote date assigned by Chinese records to its introduction, and the circumstance that the introducer is unknown are irreconcilable with the supposition that it was brought to this country by the Portuguese, their first arrival here, under Fernand Perez d'Andrada, being, I believe, in 1517, and the earliest notice of maize in European literature dating later than 1530. To those, finally, who would urge the conflicting and erroneous opinions of the early European writers, as to the country whence maize found its way to the West, as a ground for regarding Chinese statements with equal distrust, I would answer that it is not logical to apply the same canons of criticism to Western and Chinese literature, the latter being, at the period in question, in a very different and comparatively far more advanced state of development.

Whampoa, 1867. H. F. H.

On the Introduction of Maize into China.

In answer to inquirers on this subject information has been sought from private sources and from the published works of Chinese authors. The following is a translation of a memorandum by Mei K'i-chao, the present Intendant of the Grain Revenue for the Province of Kwang-tung.

I. *Notes on Maize* (*Pao-ku*).

"*Pao-ku* is identical with *Yü Shŭ-shú*, or the jade-like Shŭ Millet.* The Complete Treatise concerning Agriculture† gives also the name of *Yü-mi*, or jade rice. The plant takes its name from the resemblance of the stem and leaves to those of the *Shŭ-shú*, or millet of Sz'-ch'wan (Barbadoes millet), compared with which, however, they are more fleshy and shorter. They also resemble the *I-i*, or *Coix lachryma*. From its lustrous white colour it obtains the name of "jade-like." It is also called *Yü Kao-liang*, and *Yu-mê*, or jade wheat. Also, from its seed having been brought originally from the country of Si-fan,‡ it is likewise called *Fan-mé*, or *Fan* wheat; and, having been formerly presented as tribute, it is also called imperial wheat, *Yü-mé*.§ Other names are in use, such as *Jung-shu*, or western pulse (*Jung* designating the territories to the westward of ancient China), and *Yü Shŭ-shú*, or jade millet of Sz'-ch'wan. The variety of these terms is due to the fact that the seed was introduced from abroad, so that at first it had no definite name;

* For note respecting this plant see *post*, p. 525.

† This work, entitled '*Nung Chêng Ts'üan Shu*, was the production of Sü Kwang-k'i, an enlightened statesman of the sixteenth and seventeenth century, noted for his friendship with the Romish missionaries. His treatise, above referred to, was laid before the Emperor Wan-li in A.D. 1619.

‡ The territory to the N.W. of Tibet has been known to the Chinese from the earliest times by the name of Si-fan, which has now, however, disappeared in favour of that of Inner Mongolia. The Si-fan (or Western-alien) territory borders on the present provinces of Sz'-ch'wan and Kan-su.

§ See *post*, section iv. note, p. 525.

but, as it can be used as farinaceous food, the terms rice, wheat, millet and pulse have been made use of.* The names *Pao-ku* (sheathed grain), *Su-mi* (millet rice), and *Pao-su* (sheathed millet), are the designations current in the southern provinces.

"The stem grows to a height of 3 or 4 feet (42 to 56 English inches) or upwards. At each joint a sheath is put forth, growing outwards from the side of the stem, in shape like the *Tsung* fish.† At the extremity of the sheath a beard of an inch or more in length is formed. The seeds are in size like those of the *Tz'* plant,‡ and are clustered together, enveloped in several layers of a white external covering. It flowers about the end of summer.

"The Pun Ts'ao§ classes this plant with the cereals (*Ku*), remarking that its grain has a sweet flavour, and that its medicinal qualities are aperient. In poor country places and remote districts it is occasionally used as food. In the neighbourhood of Peking its common name is *Yü-mi*, or jade rice.

"The seeds are ground into flour and mixed in the proportion of one-tenth or one-fifth with wheaten flour, to which it adds whiteness and an agreeable appearance; but no one uses it as food by itself, from fear of indigestion. The maize grown in the province of Kwang-tung is slightly different, having yellowish grains.

"It is said that maize abounds chiefly in the provinces of Yün-nan and Kwei-chow, where tradition asserts that it was brought from Cochin-china by Ma Fu-po,‖ but there is no genuine evidence to this effect, and confidence must not be rashly placed in the tradition. Examination of the two works above quoted, both published under the Ming dynasty, elicits only that the seed was first brought from Si-fan; but of the period at which this took place they say not a word. It is further noted that this grain was heretofore presented as tribute, but again no date is assigned. It is evident that its introduction must have taken place at a very early period; as, at the time when these works were compiled, no information could be procured."

* The writer appears in this passage to be seeking to make clear the fact that the maize plant, not being indigenous to China, has no authorized appellation sanctioned by the uses of antiquity, and that hence the names under which it is known are merely comparative and fluctuating, according to individual or local choice, although the obvious characteristics of the plant confine the selection within the range of cereal species.

† *Tsung-yü*, a species of *Sciræna*, the tapering body of which resembles in some degree the bract of the maize plant.

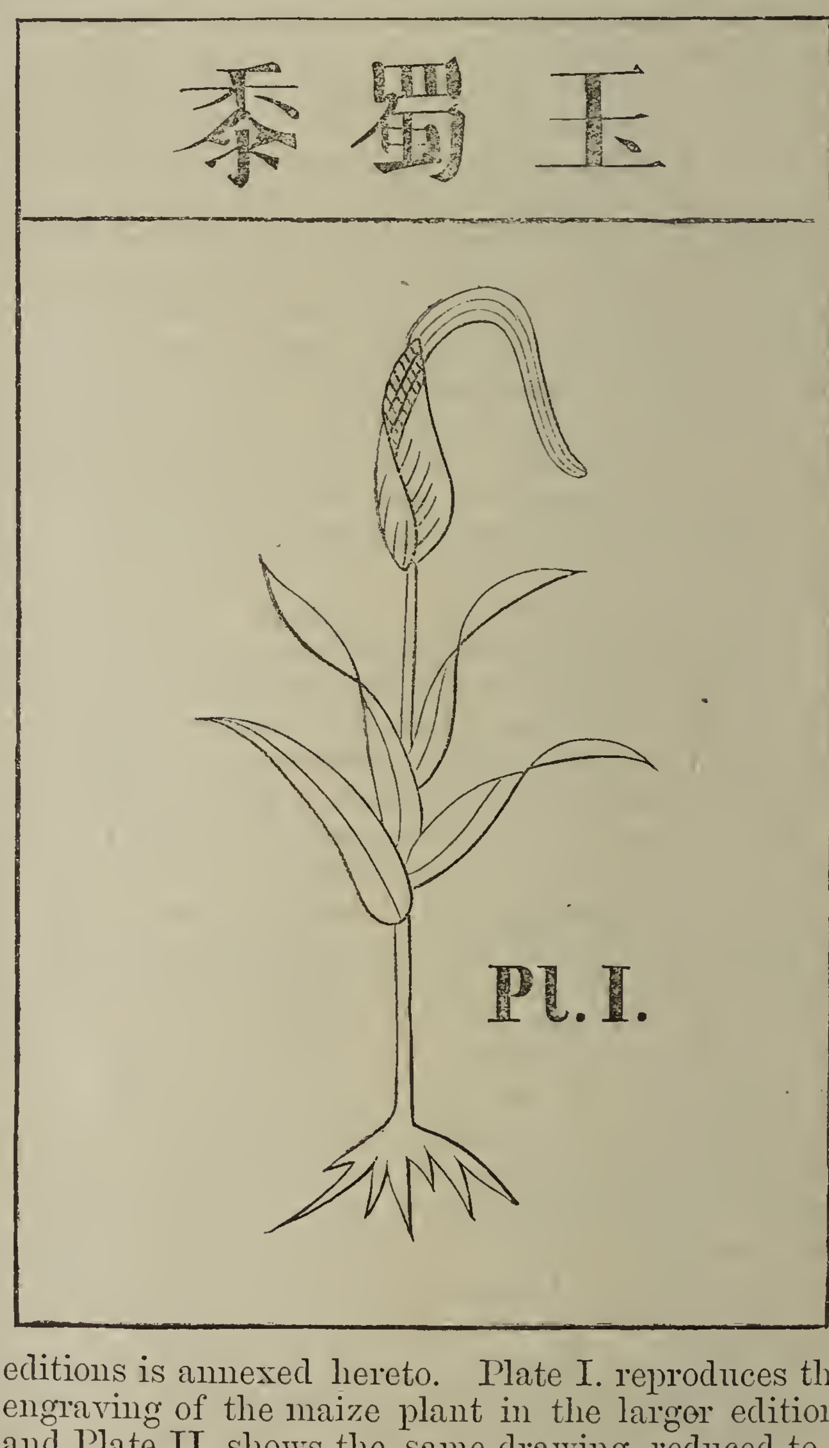
‡ *Tz'-shih*, an aquatic plant, resembling the nelumbium, cultivated for its seeds, which are used in medicine. In size and farinaceous appearance they are not unlike those of the maize plant. [This has been proved on further investigation to be *Euryale ferox*, Sal.—H. F. H.]

§ For note on the Pun Ts'ao and extracts respecting maize, see *post*.

‖ Ma Fu-po, or Ma Yüam, the celebrated general of Kwang Wu of the Eastern Ham dynasty, A.D. 30. It is noteworthy that Chinese history records an expedition, headed by Ma Yüan, against the Si-fan tribes, in A.D. 36, prior to the campaign in Cochin-china, with which his name is most commonly associated. If the maize plant was really brought from the Si-fan territories to the Western Provinces of China, as the native records assert, it may well have been among the results of this early expedition; whilst a confusion in the popular tradition as to its origin is also not unintelligible, in view of the constant connection of Ma Yüam's name with his famous victories in Cochin-china.

II. *Extract from the Pun Ts'ao, or Cyclopædia of Natural History.*

[*Note.*—The *Pun Ts'ao Kang-mu* was composed by Li Shih-chên during the latter half of the sixteenth century, but was not published until after his death, having been laid before the Emperor Wan-li by his son in A.D. 1597. It remains to this day the standard work of reference among the Chinese for all subjects relating to natural history and medicine; but the text of the original has been largely added to and reclassified by subsequent editors.* It has proved impossible to obtain a sight of an ancient copy of this work, and the extract translated below is taken from the edition of 1655, from which all later reprints have been made. The original plates are transferred to each edition, whether of octavo or duodecimo size; and a specimen from two of such



editions is annexed hereto. Plate I. reproduces the engraving of the maize plant in the larger edition, and Plate II. shows the same drawing, reduced to a smaller scale. Plate III. is a figure of the Barbadoes millet (for note respecting which, see next page).]

"*Yü-shŭ-shŭ*, common name *Yü-kao-liang*.

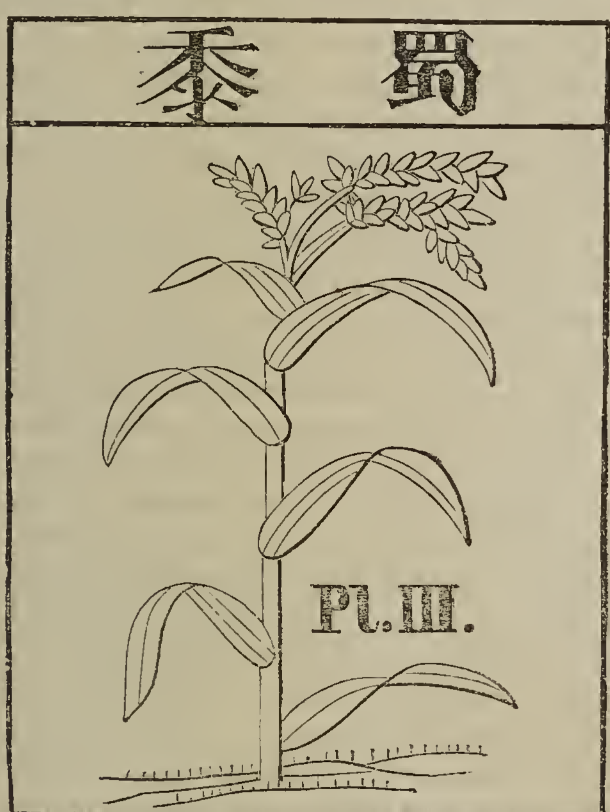
"The text of Li Shih-chên is as follows:†—The seed of the *Yü-shŭ-shŭ* came from the lands on the West, and it is cultivated by but few. Its stalk and

* Notwithstanding the additions to or reconstruction of the text by successive editors, the words of the original are, in accordance with invariable rule, both scrupulously preserved and carefully distinguished. Thus, in the modern editions of the Pun Ts'ao, the text of the author is specifically quoted at the head of subsequent additions or commentaries.

† See remarks in previous note.

leaf both resemble the *Shŭ-shŭ* (Barbadoes millet), but are more fleshy and shorter. They also resemble the *Coix lachryma;* the stalk grows to a height of 3

or 4 feet; it flowers in the sixth or seventh month, producing an ear like that of the *Pi-mé*. From the heart of the stalk there issues a sheath in shape like



the *Tsung* fish, from which a white waving beard grows out. After a time the sheath opens and the grain comes forth. The grains are clustered together, each one as large as a *Tsung* (?) [used as a generic term for palms] seed, and yellow and white in colour; they may be eaten baked or roasted. When roasted, they burst into a white flour-like mass, similar in appearance to that produced when rice of the glutinous kind is roasted."

III. The following are the references of the Pun Ts'ao with respect to the Barbadoes millet (*Sorghum vulgare*, Pers.):—

"The plant known as the Shŭ-shŭ, or millet of Sz'-ch'wan, has the following synonyms:—*Lu-ts'i*, reed grain; *Lu-sŭ*, reed millet; *Mu-tsi*, wood grain; *Ti-liang*, reed millet; *Kao-liang*, tall millet. Li Shih-chên observes: 'The Sz'-ch'wan millet was not much known in former times, but it abounds at present in the northern provinces.' The work called the '*Kwang-ya*,' gives the names *Ti-liang* and *Mu-tsi* (see above), on account of its belonging to the millet tribe; but from its growth to a height like that of the reeds called *Lu* and *Ti*, it has become popularly known by the various names given above. The seed was first introduced from the territory of Shŭ (the ancient name of the present province of Sz'-ch'wan, on the western frontier of the empire), whence it is called Sz'-ch'wan millet."

IV. Apart from the Pun Ts'ao, notices upon the present subject have also been sought in the '*Kê Chih King-yüan*,' or 'Mirror of Classified Research,' a vast cyclopædia of information in all departments of physical study practised by the Chinese, with references under each heading to antecedent works. This collection, in twenty-four volumes, was published in 1735 by Chên Yüan-lung. It contains no reference to maize under the name of *Yü Shŭ-shŭ*; but describes the plant as *Yü-mê* (imperial wheat),* in the following terms:—

"*Yü-mê*, or imperial wheat, originated in the Si-fan territory (the lands beyond the western frontier of China Proper), and its ancient name was *Fan-mê*, or 'wheat of the foreign lands of the West.' Having been offered among tribute, it has received the name of imperial wheat. In its stem and leaf it is the congener of the *Ts'i*, or panicled millet, and, in its flower, of rice. The sheath enclosing the ear is like a closed fist, but longer. The beard resembles red threads. The seed is like the grain of the *Tz* plant, but large, lustrous, and white. The flower blooms at the top of the plant, and the seed (ear?) grows out from the joints."

V. The same work from which the above notice is taken, contains a quotation from a historical work called '*Tu Yang Tsa Pien*,' or 'Miscellanies of Tu-yang,' throwing light on the practice of presenting new species of plants as tribute to the Emperor. The extract is as follows:—

"In the eighth year of Yüan-ho,† of the Tang dynasty, *Pi-mé*, clear green wheat, was offered as tribute by the kingdom of Ta-chên. In size it was larger than the wheat of China, and its seeds, both within and without, were of a clear green colour. Its scent was like that of the non-glutinous rice."

Canton. W. F. M.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Borax.—The principal form of native borax is the mineral *tincal* from India. [§ It is also made artificially by boiling together in proper proportions boracic acid and carbonate of soda.] The boracic acid is derived from the water of the lagoons, little lakes formed by the condensation of the steam of volcanic origin, which issues from the earth in several districts, particularly at Lardarello, in Tuscany. The water of these lagoons is evaporated by causing it to pass slowly down an inclined and terraced roof heated by the steam and vapours which issue below.

Borax is an abnormal salt, the constitution of

* See *ante*, reference from note, p. 523.

† The reign known as Yüan-ho commenced in A.D. 806.

which cannot be expressed by any simple formula. It may be noticed, however, that it contains the elements of two molecules of a metaborate, $NaBO_2$, with boracic anhydride B_2O_3; or, since it is probable that part of its water is constitutional, it may be represented as an acid metaborate with water of crystallization, $2(NaBO_2HBO_2)9H_2O$. Normal boracic acid is H_3BO_3; take from this the elements of water, H_2O, and metaboracic acid remains.

Borax presents a weak alkaline reaction with litmus paper. [§ A hot saturated solution when acidulated with any of the mineral acids lets fall as it cools a scaly crystalline deposit (boracic acid H_3BO_3), the solution of which in spirit burns with a green flame.

The boracic acid is produced thus:—

$$Na_2B_4O_7 + H_2SO_4 + 5H_2O = Na_2SO_4 + 4H_3BO_3.$$

Boracic acid is a very feeble acid, which decomposes carbonates but slowly in the cold; it reacts with turmeric as alkalies do. Upon this fact is founded an excellent test for its detection. The borate is mixed with a slight excess of hydrochloric acid and a piece of turmeric paper dipped into the solution. Upon drying the paper it appears of a reddish-brown colour, which becomes blue on moistening it with weak potash. Boracic acid is employed in the Pharmacopœia as a test for turmeric powder in rhubarb. Borax neutralizes acids to the same extent as an amount of sodic hydrate or carbonate containing the same quantity of sodium. Thus $Na_2B_4O_7 10H_2O$ will neutralize $H_2C_2O_4 2H_2O$; half a gram-molecule, or 191 grams, will, therefore, neutralize 1000 cubic centimetres of the volumetric solution of oxalic acid.

Bromum.—[§ A liquid non-metallic element obtained from sea-water and from some saline springs]; also, in small quantity from *kelp*, the ash of seaweed. From whatever source it is obtained, the same principle is adopted in its preparation. The liquids from which the most easily crystallizable salts have been removed are made to receive a current of chlorine gas. Chlorine has a greater affinity for metals than that possessed by bromine, consequently upon such treatment the bromides present undergo decomposition and the bromine is set free. Thus if bromide of magnesium be the salt operated upon, as is usually the case, the reaction proceeds thus:—

$$MgBr_2 + Cl_2 = MgCl_2 + Br_2.$$

Excess of chlorine is to be avoided or it combines with the liberated bromine. The liquors which are now brown are shaken up with ether, which dissolves out the bromine, and rising to the surface, carries it with it. Drawn off and shaken up with a solution of potash, the ether gives up the bromine to the potash, which, after it has been several times employed in the same way, becomes finally saturated with bromine and neutralized. On evaporating to dryness the solution of bromide and bromate of potassium thus obtained, heating the residue to destroy traces of brominated organic compounds, and finally distilling the residual bromide of potassium with sulphuric acid and black oxide of manganese, bromine is found in the receiver.

$$2KBr + MnO_2 + 3H_2SO_4 = Br_2 + 2KHSO_4 + MnSO_4 + 2H_2O.$$

[§ Bromine is a dark brownish-red, very volatile liquid, with a strong and disagreeable odour. Its specific gravity is 2·966. Agitated with solution of soda in such proportion that the fluid remains very slightly alkaline, it forms a colourless liquid:—

$$(6NaHO + 3Br_2 = \underset{\text{Bromide.}}{5NaBr} + \underset{\text{Bromate.}}{NaBrO_3} + 3H_2O),$$

which, if coloured by the further addition of a small quantity of the bromine, does not become blue on the subsequent addition of a cold solution of starch.] This last test is intended to indicate that the bromine is free from iodine, but it is quite useless for this purpose, and founded in error. If iodine were present in a sample of bromine, the whole of it would be converted into iodate which would not be decomposed by the addition of bromine.

$$6NaHO + IBr_5 = 5NaBr + NaIO_3 + 3H_2O.$$

To detect iodine in bromine, dissolve the sample in weak sulphurous acid, employed in such proportion as to produce a solution almost, but not quite, colourless. The whole of the bromine and part of the iodine will thus be converted into hydracids, a small quantity of the iodine remaining unchanged.

$$Br_2 + H_2O + SO_2H_2O = 2HBr + H_2SO_4,$$

and—

$$I_2 + H_2O + SO_2H_2O = 2HI + H_2SO_4.$$

It can then be recognized by starch.

The boiling-point of bromine is 145·4°, not 117° F., as stated in the Pharmacopœia.

Bromine, in its chemical relations, stands intermediate between chlorine and iodine. Its atomic weight 80 is very nearly the mean of 35·5 and 127, which are those of chlorine and iodine respectively. The crystalline form of the chloride, bromide, and iodide of any given metal is the same in nearly all cases. The elements themselves, though different in many characters, resemble each other closely in not a few. They all three form coloured vapours, with an odour which, when concentrated, is exceedingly irritating and corrosive, but when feeble, as when the vapour is diluted largely with air, reminds of the sea. Chlorine is a green gas, condensable to the liquid state; bromine is a very volatile liquid forming a brown vapour; iodine a solid, but volatile and producing a purple vapour. Each combines when in the gaseous state with an equal volume of hydrogen to form a colourless gas, which is very soluble in water, and forms a strongly acid solution.

THE COMBINATIONS OF CARBONIC ANHYDRIDE WITH AMMONIA AND WATER.

BY EDWARD DIVERS, M.D.

(*Concluded from page* 507.)

Products of the Distillation of Sal-Ammoniac with Chalk, with Potassium Carbonate and with Sodium Carbonate.

Sal-Ammoniac with Chalk.—I have already stated the collective evidence showing that when ammonium carbamate is volatilized, it is not converted into vapour of itself, but into a mixture of carbonic anhydride and ammonia. In the case of the carbonates of ammonium, the evidence of their decomposition into these gases and water when heated is still more conclusive, as some water is always obtained in the free state. The nature, therefore, of the products obtained by distilling a mixture of sal-ammoniac and chalk depends upon the behaviour of a mixture of water vapour and ammonia and carbonic anhydride gases; or, to go a step further, as these substances do not combine with each other until their temperature is much below the condensing-point of steam, and that, therefore, much of the water separates from the mixture in the liquid state, the nature of the products depends upon the reaction of equivalent quantities of moist carbonic anhydride and ammonia, and the behaviour of the product of this reaction with liquid water.

It is always stated that the products of the distillation of sal-ammoniac and chalk are the substance

$$(CO_3)_3(OH_2)_2(NH_3)_4,$$

water and ammonia gas; but I am not aware of the publication of any investigations on which this statement rests.

It would naturally be made on theoretical considerations, based on the ascertained composition of the carbonate as it appeared in commerce. All my own experiments on the subject, direct and indirect, prove it to be incorrect, and I am almost fully convinced that this statement is an incorrect one, and has been advanced upon theoretical grounds only.

In the distillation of a mixture of chalk and sal-ammoniac no ammonia escapes, the evolved gases entirely condensing. The carbonic anhydride and the ammonia combine to form ammonium carbamate, while the water is deposited in a free state. The carbamate and the water very slowly combine together. On redistilling these products, the commercial carbonate and free ammonia are the new products obtained, unless the distillation is carried on very slowly indeed. So that it is in the refining process that the commercial carbonate is obtained, and not in the primary operation.

Sal-ammoniac with Potassium or Sodium Carbonate.—When sal-ammoniac is distilled with either of these carbonates, the products are the same as when chalk is used, except that in the first part of the distillation some ammonia escapes. The evolution of the excess of ammonia is due to the unchanged carbonate of potassium or sodium combining with some of the carbonic anhydride and water, and forming acid carbonate.

Sal-ammoniac and Pearl-ash distilled with Aqueous Alcohol.—When pearl-ash, with fully its equivalent of sal-ammoniac, is distilled with aqueous alcohol, according to the directions of the London Pharmacopœia for preparing spiritus ammoniæ aromaticus, the first portions of the distillate soon deposit crystals in the receiver. By allowing a sufficient quantity of fluid to distil over, these crystals redissolve. The distillate, as a whole, is a solution of normal carbonate. The crystals deposited by the earliest portions of the distillate are very minute; but on letting stand some of the earlier portions of the distillate of such a strength as only to form crystals slowly, a good quantity of very thin, six-sided tables are deposited, which both by their appearance and behaviour on exposure to the air, prove to be half-acid carbonate. Acid carbonate is also formed. The mother-liquor is basic, or contains more than two atoms of ammonia to one of carbonic anhydride.

The spiritus ammoniæ aromaticus generally proves to contain caustic ammonia, and I think—I cannot speak with certainty—not unfrequently much less carbonate than it is intended to contain. By following the directions in the British Pharmacopœia, to use solution of ammonia and commercial carbonate instead of pearl-ash and sal-ammoniac, the formation of a spirit containing excess of ammonia is favoured, but to only a small extent. The spirit thus obtained is, of course, equally liable, if too strong in alcohol, to decompose into a basic solution and half-acid or acid carbonate, as I ascertained by preparing it. During the distillation crystals are apt to deposit in the neck of the retort, but they are soon dissolved again as the process goes on. The effects of distilling the commercial carbonate with aqueous alcohol and with water will be described presently.

Products of the Distillation of the Normal, the Acid, and the Half-acid Carbonates of Ammonium.

When the normal carbonate is distilled slowly enough, the products are carbamate and water, and, when the acid carbonate is similarly distilled, the product is the acid carbonate again; but when either the normal, the acid,* or the half-acid carbonate is distilled faster than the whole of the products of distillation can condense in the receiver, partial condensation takes place in such a way that *the carbonate of commerce is formed*, according to the respective equations—

$$2\,[CO_2 + 2\,OH_2 + 2\,NH_3] = (CO_2)_2OH_2(NH_3)_3 + 3\,OH_2 + NH_3$$
$$3\,[CO_2 + OH_2 + NH_3] = (CO_2)_2OH_2(NH_3)_3 + 2\,OH_2 + CO_2$$
$$3\,[3\,CO_2 + 4\,OH_2 + 4\,NH_3] = 4\,[(CO_2)_2OH_2(NH_3)_3] + 8\,OH_2 + CO_2.$$

Products of the Slow Distillation of the Commercial Carbonate of Ammonia.

On distilling the commercial carbonate very slowly, a thin film of liquid first condenses, which soon becomes a thin layer of crystals, probably of normal carbonate. Next, after a cessation in the volatilization, during which the temperature rises several degrees, some moist ammonium carbamate deposits. (This is really the first product of the distillation, the normal carbonate being only the product of the action of moisture—that adhering to the carbonate and to the retort and that in the air—on the ammonia and carbonic anhydride into which some of the carbamate of the commercial salt always passes when placed in a fresh volume of air.) After this, slightly moist commercial carbonate $[(CO_2)_2OH_2(NH_3)_3]$ is deposited, forming the great bulk of the products. Lastly, a very thin layer of moist and more acid carbonate is formed either by direct condensation or else by the action of water and carbonic anhydride on the superficial part of the commercial carbonate already deposited. When, therefore, the commercial carbonate is distilled very slowly indeed, the product consists principally of the same substance; by a more rapid distillation the product consists almost entirely of it.

Products of the Distillation of the Carbonate formerly in Commerce.—These have been examined by Rose. I have not succeeded in getting a carbonate of the composition the commercial substance used to have. But I have already shown that the main product obtained by Rose had the composition of the carbonate at present in commerce *plus* water. Unlike, therefore, the present carbonate, it yielded a product essentially different from itself by slow distillation. The remote part of the deposit was neutral.

Commercial Carbonate distilled with enough Water to cover it.—The effects of this distillation carried on at as low a heat as possible have been already described, so far as the changes in the retort are concerned. The deposit was formed by a distilling-heat of about 53° in a very warm condenser. It was moist and crystalline, and appeared qualitatively to be slightly ammoniacal acid-carbonate. Analysis proved it to be so.†

Commercial Carbonate distilled with Spirit of 90 *per cent.*—Hünefeld ascertained that by distilling commercial carbonate with spirit, a deposit condensed which was neutral in composition. I have repeated his experiment and have partly described the results.

It only remains to add here that the deposit, which was crystalline and saturated with aqueous alcohol, proved to be ammonium carbamate.

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* The formation of the commercial carbonate from the acid-carbonate in this way was patented by F. Clarke Hills in 1846.

† Gossage patented, in 1855, the production of the acid-carbonate and a residual solution of the normal carbonate by distilling an aqueous solution of the commercial carbonate.

SANTONIN, AND ITS DETECTION IN THE URINE.*

BY WALTER G. SMITH, M.B.

Two singular effects are known to result from the administration of santonin in moderate doses, viz. visual derangements and a peculiar alteration in the colour of the urine. It is with the latter phenomenon that the author principally deals, but he gives personal testimony to the effect of santonin on the vision. Three hours after taking five grains of pure white santonin he became conscious, while reading, of a yellowish tint on the paper and a yellow haze in the air. His own hands, and the complexions of others, appeared of a sallow, unhealthy colour; and the evening sky, which was really of a pale lavender colour, seemed to be light green. Vision was not perfectly distinct for some hours, and was accompanied by a certain vagueness of definition.

Many substances, when taken into the stomach, visibly affect the characters of the urinary secretion in their transit through the system, and a number of vegetable colouring matters seem to pass unaltered into the urine. For example, madder communicates a red tint to the urine, and under the use of senna this secretion acquires the property of being reddened by ammonia. When rhubarb is administered it tinges the urine yellow or red, according as the reaction of that fluid is acid or alkaline. Carbolic acid, absorbed by the stomach, causes the urine to become greenish, and when freely applied to the skin has frequently developed a smoky or even black colour. Since the isolation of santonin by Kahler, forty years ago, it has almost entirely superseded santonica, and within the last twenty years has been largely and increasingly employed as a safe and efficient vermifuge. Various observers have noticed that the urine of persons under the influence of santonin is tinged of a saffron-yellow or greenish colour, and Giovanni and Ambroise state that it often induces apparent hematuria. The urine of some of the lower animals, *e. g.* rabbits, is similarly affected. As in the case of rhubarb, the shade of colour depends, no doubt, on the reaction of the urine, which is coloured yellow when acid, and purplish-red when alkaline.

The attention of the author was drawn to the subject by a case in which a boy aged five was given four grains of white santonin on the evening of August 18th last. Next morning the urine, which had been kept in a tall glass vessel, was of a bright pinkish-red. On the evening of the 19th, the boy took another four-grain dose. The urine passed soon after was of a greenish-yellow colour. A few drops of liq. ammoniæ immediately produced a clear red tint. The author then made a series of experiments on himself, the result being that he found the presence of santonin in the urine might be detected by the alkali test in periods varying from ten to fifty minutes after it had been taken, and that it was eliminated in from thirty to fifty hours.

A small quantity of saliva was several times tested, but always with negative results. It is stated that the serum of the blood is coloured yellow by a large dose. The colour of the urine was in all cases greenish-yellow, sometimes approaching a light saffron tint, the greenish hue being best seen by looking obliquely across the surface of the fluid. It resembled the urine of a person slightly jaundiced, and, like it, stained linen of a persistent light yellow. In two other respects also it curiously conformed to bilious urine. When nitric acid was dropped on a small quantity, a distinct purplish colour was brought out, which, however, was evanescent. Again, when sulphuric acid was added drop by drop, it developed a reddish-brown colour, changing to a deeper brown. No such effects were produced on the urine, when not under the influence of santonin. The sulphuric acid reaction was less ambiguous than the nitric acid, which might affect the colouring matter of normal urine somewhat similarly. These reactions, viewed in connection with the altered colour of the urine, show that it would be quite possible, from a hasty examination, to make an erroneous diagnosis of bile in the urine, and point to a possible fallacy in regard to the two most common clinical tests for bile.

The alkali test for the detection of santonin in the urine is a very striking one, and may be noticed both as to its character and its sensitiveness. It simply consists in the addition of an alkali to the urine, when a fine cherry red or crimson colour will immediately be developed, according to the amount of santonin present. The urine will respond to potash, soda, or ammonia, and also to lime or baryta water. If a globule of potassium be dropped on the urine, a bright-red track is left wherever the burning metal skims along the surface. At first ammonia was employed, and the colour is well brought out by pouring a few drops of liquor ammoniæ down the side of the test-tube, so as to float on the urine, when the red zone will appear sharply marked at the line of junction of the two liquids. But potash was afterwards found to be a more delicate reagent, and is better suited for general use. The red alkaline fluid is not bleached or altered by boiling, but the colour is at once destroyed by any acid, even carbonic acid gas. The subsequent addition of alkali restores the colour as before; hence it may be inferred that the colouring substance is not impaired or broken up by acids. Bicarbonate of sodium produced no immediate change, but on boiling for some time the reddish tint was gradually developed, and was discharged by continued boiling. Carbonate of sodium afforded similar results, except that it required longer boiling before the colour was discharged. Phosphate of sodium gave no result. The red-coloured stratum soon subsides to the lower part of the test-tube, carried down by the precipitated phosphates. Prolonged exposure to light in contact with excess of alkali bleaches out the colour, and chlorine at once dissipates it. Considering the sparing solubility of santonin, one part requiring 5000 parts of water at 17·5° C., the delicacy of the test will be apparent when it is stated that santonin was detected in the urine within ten minutes after 4 grs. were taken, and within an hour after but 1 gr. was taken. In one experiment the urine voided twenty-four hours after the dose gave a decided red colour with liq. potassæ, even when diluted with three parts of water.

For ordinary doses of from 3 to 6 grs. about two days are required for elimination, and it is to be remarked that the urinary coloration and reaction to the alkali test are more persistent than the phenomena connected with vision.

When the red liquid is examined with the spectroscope, the red, orange and yellow rays are transmitted, while the blue end of the spectrum is absorbed. In a more dilute state the red and blue rays are transmitted, and the centre of the spectrum is stopped. No characteristic absorption bands are produced. In order to determine the nature of the colouring material found in the urine, and to ascertain its behaviour with reagents as an aid towards its isolation, the following process was adopted at the suggestion of Dr. Emerson Reynolds:—About a pint of urine, passed after taking 4 grs. of santonin the preceding evening, was treated with neutral acetate of lead, avoiding excess, and then filtered. To the filtrate, neutralized by potash, basic acetate of lead was added so long as any precipitate was formed, and until the fluid became colourless. Neutralized, filtered, and washed. The yellow precipitate was transferred to a beaker, and decomposed by the cautious addition of dilute suphuric acid; spirit of wine was added, and the beaker set aside for twenty-four hours. Filtered; removed excess of sulphuric acid by barytic water, and filtered. The clear fluid now gave the pink reaction distinctly with potash, but ammonia had no longer any effect. The colouring

* Abstracted from a paper published in the *Dublin Quarterly Journal of Science* for November, 1870.

matter, therefore, was evidently set free, but the quantity at command was too small to admit of a more minute examination. The red alkaline filtrate gave a bulky precipitate with alum; but when this precipitate was filtered off, neither the precipitate nor the filtrate any longer afforded a trace of colour with potash. The liberated colouring substance does not seem to enter into combination with nitrate of silver, nor is it visibly affected by corrosive sublimate, sulphocyanide of potassium, chloride of gold, or bichromate of potassium. With persalts of iron it gives a permanent rich brown colour. From these experiments it may be gathered that the colouring material is tolerably stable, that it combines with *basic* acetate of lead, and can still be detected in that state of union by the potash test. It is highly probable that the colour-developing substance is a feeble acid derived from the intra-vascular oxidation of the santonin, and in support of such a view an experiment of Mialhe may be brought forward.

When santonin, in powder, is submitted to boiling nitric acid, a product is obtained which, after saturation, gives, with water, a greenish-yellow solution, analogous in appearance to that which urine assumes under the influence of santonin. This liquid, when treated with an alkaline base, immediately developes a deep orange-red coloration similar to that which urine secreted after the ingestion of santonin assumes with alkalies. This experiment has been repeated on the white and yellow forms of santonin, and with corresponding results; yet, though the reddened alkaline fluid gave an abundant yellow precipitate with basic acetate of lead, neither the precipitate nor its filtrate were any longer coloured by potash. Neither could any coloration be obtained on decomposing the lead precipitate with sulphuric acid, and testing the fluid decanted from the sulphate of lead with potash. If in these respects the artificial colouring matter fails in its analogy to the natural colouring substance in santonic urine, still Mialhe's experiment may be regarded as indicating the direction in which to seek for the cause of the natural phenomenon.

PRODUCTS OF THE ISLAND OF HAINAN.

BY R. SWINHOE.

The visitor from China is specially struck with the abundance of the cocoa-nut-tree—a tree not found in the latitude of Canton—which meets the eye on all points of the island coast. In spite of the winter monsoon, it flourishes best in the north-east corner of Hainan, in the district of Wênchang. Further in the interior, as the ground rises, the pine (*Pinus sinensis*) appears, and in some spots clumps of pine and topes of cocoa-nut grow side by side. The cocoa-nut also was found growing on the opposite shore of the Luichow peninsula, and on the small island of Naochow, off the right of the peninsula, in latitude 20° 45′. The cocoa-nut is not known in Formosa, excepting in one spot at the foot of the mountains, about twenty miles from the S.W. coast, where a few trees flourish, which there is good reason to believe were introduced by the Dutch. The areca was everywhere largely cultivated, as it is also in South China and Formosa. Fine banyans shaded the villages, growing to a large size. I observed three species—the ordinary *Ficus nitida*, a large-leaved species found also about Canton, and a species with small glabrous leaf and yellow berry—all equally grand and umbrageous trees. On the high-road to the capital and about the city itself two peculiar trees presented themselves—the one with black pods, ten inches long, hanging downwards all over it; the other, with long scimitar-shaped pods, twenty inches long, covered with an ochreous woolly down. Both these were new to me, and I brought home specimens of the pods, and submitted them to Mr. Bennett, of the British Museum, who pronounces the first an Asclepiadeous tree of an unknown species, and the latter a *Spathodea*, nearly related to *Spathodea stipulata*. Other village trees not often seen in China were the jack, the breadfruit, and the tamarind.

In the mountain forests the *Liquidambar formosana*, of Hance, was the commonest tree, associated with noble fig-trees of great variety and beauty. Palms also were abundant; on the higher ground the cocoa-nut giving place to fan-palms, caryota, phœnix, etc. The undergrowth was traversed in all directions by rattans and other tangles innumerable, so as entirely to impede passage through. The finest woods for fragrance and for sculpture are procured from the mountains of Hainan; and Du Halde, in his 'Histoire de la Chine,' states that the Emperor Keenlung had some carried to Pekin at immense cost to decorate a palace he was building for his sepulture. The most precious of these woods is the *hwa-le*, named by Europeans rose or violet-wood on account of its odour, which the Chinese procure by barter with the hill tribes. Then there is the *kao-kên*, or eagle wood, a very hard timber, a specimen of which I procured at Hoitow, and brought home for the Kew Museum. There is also a very fine and incorruptible yellow wood, columns of which, of a certain thickness, are priceless, and said to be reserved, as is the hwa-le, for the service of the Emperor. This yellow wood is much used in the island for building purposes, but I noticed that its bright colour soon fades when exposed to the light. One tree exudes an abundance of a gummy matter, which is brought down in large lumps to the west coast, and thence exported for sizing purposes. Another tree, probably the same as the *Aloexylum Agallochum* (Loureiro) of Cochin China, yields the "ching-heang," or fragrant wood, so much sought after by the Chinese for incense and for carving into ornaments. This is procurable in large quantities in Nychow city in the south end of the island, where the best kinds are sold for about 1*s.* an ounce, and the coarser kinds, used for burning, for about 6*d.* a pound. The Chinese did not know the tree, and could give no account of it, but Loureiro says that it is only the decayed parts of the tree that are so highly scented, and he attributes it to a disease. In the south also they have the tree which yields the "dragon's blood," and others with sweet-scented sap used for incense.

About the jungles of the south a species of *Alpinia*, with upright flower, lately described by Dr. Hance, her Majesty's Vice-Consul at Whampoa, as *A. officinarum*, grows wild, and its roots yield to trade the valuable drug galangal. Its berries, which are also used as a drug by the Chinese, and were described and figured by Mr. Daniel Hanbury in 1855, are infused and taken by the aborigines as a substitute for tea. The tea-plant is cultivated in Hainan by the Chinese, and a very coarse kind of tea prepared from it; but whether it is indigenous to the island or has been introduced, I was not able to ascertain. The fruits of the country are cocoa-nuts, areca or betel-nut, mangoes, indifferent oranges, limes, jackfruit, breadfruit, papaws, lichees, longans, jamboos, carambolas, bananas and tamarinds.—*The Field.*

Supposed Suicide by Carbolic Acid.—An inquest was held lately in Liverpool on the body of George Carey, a shipkeeper, who was found, apparently in a fit, in the cabin of a vessel in which he had been keeping watch. A bottle labelled "Carbolic Acid" was on the floor, with the cork drawn. He was taken to the Southern Hospital, where he died. His breath smelt strongly of carbolic acid, and it is supposed that he had taken a quantity of it from the bottle found on the cabin floor. No cause could be assigned for such an act, except that he had been fined in the morning for losing a tide watch. The jury returned an open verdict.

Effect of Coffee upon Iodine.—Hutet mentions that one grain of iodine, added to a teaspoonful of strong infusion of coffee, has no longer any taste or smell, and does not give the blue tinge to starch.—*Lancet.*

THE COMPARATIVE EFFICACY OF ANTISEPTICS.

Dr. F. Crace Calvert has performed two series of experiments in order to ascertain the comparative powers of various substances ordinarily used as antiseptics. The first consisted in placing in bottles (not corked) solutions of albumen and flour-paste. To these he added various proportions of some of the substances patronized at the present time as antiseptics, and the following table shows the time in which an offensive odour became sensible at a temperature from 70 to 80 degrees F.

Antiseptic employed.	Per cent. of antiseptic.	Albumen.	Flour-paste.
M'Dougall's disinfecting powder	5	11 days	25 days
Carbolic disinfecting powder	5	Sound	Sound
Chlor-Alum (made lately)	2	9 days	—
Chloride of zinc	2	15 days	—
Chloride of lime	5	16 days	14 days
Permanganate of potash	5	—	—
Tar oil	2	11 days	25 days
Carbolic acid	2	Sound	Sound
Cresylic acid	2	Sound	Sound
None	—	5 days	7 days

The above table he considers clearly to show that the only true antiseptics are carbolic and cresylic acids; and these results coincide with those obtained by Mr. William Crookes, F.R.S., Dr. Angus Smith, F.R.S., and Dr. Sansom. These two acids continued their action till the albumen solution and paste dried up. The second series had the object of ascertaining which of the undermentioned substances is most active in destroying germs, and preserving animal substance. At the bottom of wide-mouthed pint bottles, Dr. Calvert placed a known quantity of each of the antiseptics, suspending over them by a thread a piece of sound meat; and, by daily examination, it was easily ascertained when the meat became tainted or putrid.

Antiseptic used.	Became tainted.	Putrid.
Permanganate of potash	2 days	4 days
Chlor-Alum	2 "	10 "
M'Dougall's disinfecting powder	12 "	19 "
Chloride of lime	14 "	21 "
Tar oil	16 "	25 "
Chloride of zinc	19 "	—
Carbolic disinfecting powder	Did not become tainted, but dried up and became quite hard.	
Carbolic acid		
Cresylic acid		

—*British Medical Journal.*

DRUGGISTS' CHARGES.

The *British Medical Journal*, in commenting on this subject, makes the following remarks:—A great deal is being said just now in various places about the high charges of dispensing chemists, for the most part very unreasonably, and even mischievously. No one pretends to believe that the average income of the class of pharmaceutical chemists from their business is greater than that of other classes of retailers. It is well known to be less than the general average in businesses demanding a far less onerous training, and in which it is by no means so important that a highly instructed and conscientious class of men should be employed, and that they should be conveniently numerous and widely dispersed. It is of the first importance that the cheap and nasty system should not be encouraged in dispensing. Every one knows that he can buy a hat for nine shillings in one place, and for twenty-four shillings in another. He will not expect to have them of the same quality, unless he belong to the deluded race of bargain-hunters. A man can put up with a bad hat; or he can renew his purchase more frequently; but the immediate danger which he will suffer from stale infusions and extemporized makeshifts of the cheaper kinds for the most costly pharmacopœial preparations is not so easily estimated or repaired. Lucky if he escape without plaster of Paris in his sulphur, or if he get a tithe of quinine in his crystals of quinine and iron. The whole question, however, does not lie in that of the use of inferior, stale, or adulterated materials. The price of a bottle of medicine represents many things besides the ingredients: it represents skill, responsibility, character, and outward and material guarantees for all these. When a physician writes a prescription, the question is frequently asked, "Where shall I get it made up?" There are two usual ways of answering it; either to say, "Go to any respectable chemist in your neighbourhood;" or, if it be a prescription involving materials of special novelty, delicacy, or difficulty of perfect preparation, to name half-a-dozen establishments well known for their perfect arrangements, either of which can be selected. Then the importance of what we speak of as material guarantees is at once seen. There are in every large town some establishments where all the arrangements are obviously made so as to secure perfection, irrespective of cost. There are others where the special labours of the pharmaceutical chemist have been such as to inspire special confidence in his dispensing. These are all things to be paid for. Many of them are costly in themselves; all are valuable to prescribers and the public, and have a fair market-value. Druggists in poor neighbourhoods must suit their prices to the pockets of their customers. They are helped to do so by smaller shop-rents, a cheaper way of living, much less exigence and expenditure as to the elegancies of dispensing, and by consulting economy in every possible way in laying in their stock, and in the *personnel* and the arrangements of their establishments. With all this, they may resist the temptations to actual inferiority; but it is perfectly clear that the more costly arrangements, and the sole regard for perfection of material and method, are those things which we seek to secure for our patients, and which they have the greatest interest and desire to have, where they can afford to pay for them. We are not all concerned to defend druggists against charges of extortion, or to uphold a system of unduly high prices; but we feel assured that the danger lies chiefly in the other direction. We have more to guard against in the interests of effectual prescribing, in the interests of healing, and for the security of the public and ourselves, in dealing with cheap, than with dear druggists. Those medical practitioners who dispense their own medicines will certainly not be the last to recognize the truth of this proposition. Those who prescribe only well know how important it is for their patients to fall into the hands of conscientious and well-educated dispensers, who have studied their business, and charge a fair price, and supply fresh and honestly prepared medicines, without that single eye to cheese-paring which is characteristic of the cutting down system in retail businesses. Above all, it is certain that the worst evils of counter-practice go always hand in hand with cheap dispensing. If any success should attend an attempt to reduce dispensing to a system on which it could yield even smaller profits than it now does in the aggregate, the probable results, we think, would be greatly to diminish the number of places to which we could confidently allow our patients to apply for their medicines, and to degrade the practice of pharmacy to an injuriously low level. This would be both inconvenient and disastrous to all concerned. But we do not expect that any success will attend so ill-favoured and unreasonable a proposition.

The *Medical Times and Gazette* remarks that "The controversy which has been going on for some time past in the pages of two of our contemporaries is amusing, if not instructive. One result, however, may be gathered from it—viz. the accusers of pharmaceutists as overchargers know little or nothing of the matter; and the pharmaceutists are unnecessarily irate at a charge brought against them at once unfounded and absurd."

The Pharmaceutical Journal.

SATURDAY, DECEMBER 31, 1870.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

THE PROPOSED POISON REGULATIONS.

Our correspondence columns are again crowded with letters that have been forwarded on this subject, and we have been enabled to lay before our readers the following important communication:—

[Copy.]

"*Medical Department of the Privy Council Office,*
"23*rd December*, 1870.

"Sir,

"I am directed by my Lords of Her Majesty's Council to request that you will call the attention of your Council to the power which is, by the Pharmacy Act, 1868, given to the Pharmaceutical Society to make, with the consent of the Privy Council, regulations as to the keeping, dispensing, and selling of poisons.

"My Lords believe it to have been the opinion of Parliament that proper regulations in this matter are required for the protection of the public, and, as more than two years have elapsed since the passing of the Act without the Pharmaceutical Society having proposed any such regulations, my Lords think it right to inquire whether the Pharmaceutical Society intends, within any time you can specify, to propose such regulations to their Lordships. They direct me therefore to request that you will have the goodness to give me, at your earliest convenience, the information required by their Lordships.

"I am,
"Sir,
"Your obedient servant,
"John Simon.

"*The Registrar,*
"*Pharmaceutical Society.*"

Considering the near approach of the opening of Parliament, the importance of this official statement of the views held by the Privy Council will be apparent to our readers.

As further material for consideration by the readers of this Journal we also add the following extract from the editorial columns of the *Lancet* of last week.

"We are glad to observe that the Council of the Pharmaceutical Society have again decided to recommend to the Annual Meeting of the Society for its adoption certain specific regulations for the keeping of poisons. It is to be hoped that these, or similar regulations, will be accepted by the body of pharmaceutists as the solution of a much-vexed question. In the discussions which have from time to time taken place on the subject of accidental poisoning, public opinion has expressed itself in unmistakable terms in favour of the enforcement of precautionary measures of the nature of those now just formed by the Council of the Pharmaceutical Society, and which, indeed, are identical with those rejected by the Society last year. The public, moreover, will not be satisfied until some regulations of the kind are in force.

"A large amount of new blood was infused into the Council last year, and in such a way as to make it truly representative of the different interests of pharmaceutists; and it is this Council which calls upon the latter to accept certain alternative and compulsory plans for keeping poisons, viz. in separate "poison" compartments or drawers, or in bottles of a distinctive kind, or in vessels secured in such a way as to arrest the attention of the dispenser.

"It is with regret that we still observe in a few persons a spirit of antagonism to the acceptance of any regulation whatsoever for the keeping of poisons. We venture to hope, however, that they will find themselves in a very small minority at the approaching Annual Meeting of their Society. If the pharmaceutical body allows the present opportunity of legislating for themselves in the matter of the keeping of poisons (and thereby augmenting the confidence of the public towards themselves) to slip, they may find the tables turned against them, and the pressure of public opinion from without subjecting them to enactments of a still more stringent and, to them, even of a vexatious character."

MISNOMERS.

We take this opportunity of protesting against an instance of the abuse of names, which may be in itself harmless, though it is none the less a violation of the principle that the names given to things should be distinctive and not liable to be mistaken for each other. We refer to the application of the term "Chloralum" to a solution of muriate of alumina which is being introduced as an antiseptic and disinfectant by Professor Gamgee. Without wishing in any degree to disparage the usefulness of this material, we cannot omit to point out the great similarity between the name given to it and the term chloral—long before in use—as an objection which makes the term chloralum altogether inappropriate and inadmissible.

There is the more reason for urging this objection, since the use of a hyphen between the two syllables would obviate the difficulty, especially if a capital letter were used for the initial of the second syllable. We therefore suggest that it would be advantageous to the prospects of this material if its name were always written Chlor-Alum, and pronounced in such a manner as not to be confounded with chloral.

PRESCRIPTIONS FOR PROVINCIAL ASSOCIATIONS.

We have been requested by Mr. Joseph Ince to make known his thankful acknowledgment of the receipt of sixty assorted prescriptions, contributed by Mr. Albert Ebert, of Chicago, and we willingly comply with his request.

The London collection is now finished, but 876 still remain to complete the provincial series. A few words of explanation may be of service.

Both collections (London and Provincial) are under the direct sanction and personal approval of the Council and the London Board of Examiners.

They are in no way the private speculation of any individual collector—being in fact the free gift of the Pharmaceutical Society. Owing to the pressure of other engagements the task of arrangement has been abeyance during the months of November and December, but once more the work is in course of active progress.

It is hoped that each of the twelve volumes forwarded to the Country will represent a small library in itself, as no single collection will contain more than a divisional assortment of recipes kindly forwarded. The books have been bound and prepared by the Messrs. FISHER, who supply King's College, London, and many artists' firms: the insertion of the formulæ is intrusted to skilful hands. Each separate compilation will if possible illustrate the Pharmacy of England, America, France and Germany. Surely when the vessel is so near the haven where it would be, none will hesitate to lend a helping hand in order that it should pass the bar.

An easy but questionable reputation might have been gained for rapid execution, had each folio been carelessly filled up, but this has been resolutely avoided. Mr. INCE asks respectfully but earnestly, that as only 876 recipes are required, he may be allowed to finish the original design in all its integrity. The last report is as follows:—(*December*) I. Chicago—(60) II.—(11) III. (6) IV.—(23) total 100. Aid from Italy is expected daily.

The Examiners require a student to recognize objects constituting what is termed Materia Medica, as well as specimens illustrative of Chemistry—he must also show a certain familiar acquaintance with plants dried and fresh. To acquire this practical knowledge ample facilities are provided—an attempt has of late been made, in London most successfully, that the same aid may be within the reach of every learner with regard to accuracy and facility in understanding the directions of the Medical Profession, How large a share these Autograph Formulæ have in direct teaching can scarcely be conceived.

IMPORTS.

WE venture to think that the returns of the Board of Trade for 1869, as published in our columns last week, must have contained much that was interesting to pharmacists generally, many of whom, like ourselves, in perusing the list of imports officially called "other articles," must have been furnished with material for thought and reflection. The import of ether in quantity of nearly two thousand three hundred gallons (16,550 lb.) much impressed us.

Although we have little doubt that a considerable portion of this ether (manufactured entirely from pure alcohol) was exported "in bond," or in other words was consigned to the various depots of shipment under the eye of the Customs, without passing out of the bonded warehouses in which it was landed for reception into the private stores of the owners; —nevertheless we are aware that a large quantity paid the duty of twenty-five shillings a gallon, and was thereby made free to compete with the ether manufactured in this country from pure spirit of wine.

Now, let it not be thought that we purpose writing against competition generally, for we fully acknowledge that nothing can surpass, or even equal it, for bringing prices to a proper average; but we do say that the competition produced by this import is not fair, inasmuch as the advantages of the parties concerned are unequal.

On the Continent alcohol is (in quantity) of the market value of fivepence a pound. In Great Britain its cost, even of production, is ten times that amount.

Now, as few processes are conducted without some loss being entailed before the final product is brought into a state of purity, it does not require an expert to see that one might safely class such a volatile body as ether among those manufactures likely to be conducted with considerable losses.

This is of the greatest concern to the operator in this country, for, although he may take immense pains in perfecting his apparatus in order to reduce his loss to minimum, he is still at a disadvantage as compared with the Continental manufacturer in the ratio of ten to one, for he is compelled to sustain a loss upon "duty paid" spirit, while the other has the boon of "free spirit." The result is that pure ether can be offered in quantity in Germany at *ninepence* a pound, a rate at which ether cannot be made for the arts from methylated alcohol.

If asked for a remedy, we should suggest that either the Legislature grant permission to make ether from pure spirit, previous to its duty being paid, or upon which a "drawback"* has been allowed, in laboratories under Excise supervision, the duty being finally paid upon the product perfected; or to put a somewhat higher duty than the present upon imported ether, taking as a precedent the extra duty of *fivepence* per gallon proof (10*s.* 5*d.*) imposed upon foreign spirit, as compared with spirit of home manufacture (10*s.*). Such an arrangement would afford a protection to our manufacturers, and still leave room for healthy competition.

While we write upon this subject, we cannot refrain touching upon a kindred one,—*the manufacture of alcohol.* The remarks of the previous case are equally applicable; but, in addition, the evil in the latter is greater and without a parallel in the former, inasmuch as the Excise allow anhydrous ether to be freely made from methylated spirit, but will not allow anhydrous alcohol manufactured from the same spirit to be made or sold.

* A refunding of the money paid as duty, such as is practised when spirit is methylated.

Until most recently, alcohol was manufactured either by the Pharmacopœia process or by a modification of it; now, however, its production has been entirely discontinued, on account of its cost being much in excess of the market value of imported alcohol *duty paid.*

The injustice here seems to us to be the levy of duty at the ordinary rate of foreign spirit (ten shillings and fivepence per proof gallon), no cognizance being taken of the home manufacturer's loss in bringing his alcohol to such a strength,—which loss, although probably not in excess of that of his competitor, is upon *duty paid* as compared with *free spirit.*

Every one knows that our legislators care but little for private interests, their wish being to serve the public only; all, however, will agree that it should be no less their perpetual aim to offer the greatest advantages in their power to the arts.

In the case before us they have not only ignored the home manufacturer, but have at least put great restrictions upon that important branch of science, photography.

Our contemporary, the *British Medical Journal*, condemns the proposed appointment of an Apothecary-General for Ireland, on the ground that such a post will afford opportunities for unlimited jobbing and will leave no room for appeal. It is suggested that a better course would be to appoint inspectors, who should see that the contracts are properly drawn out for medicines and drugs, and that they are supplied of good quality and at a fair price.

Proceedings of the Pharmaceutical Society.

EXAMINATION IN LONDON.

December 23*rd*, 1870.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Garle, Hanbury, Haselden, Ince and Southall.

Twenty-three Candidates presented themselves for examination; the following passed and were duly registered:—

MINOR (as Chemists and Druggists).

*Hadley, Thomas .... Hereford.
*Freeman, Ernest .... Stourbridge.
*Pickering, Samuel Whaley .. Chester.
*Gower, Alfred John .... Tonbridge.
*Fowler, William Ratcliffe .... Ipswich.
*Fegan, John .... Exeter.
Weaver, Edwin Thomas .... London.
Tebbutt, Edwin .... Hemel Hempstead.
Equal. { Braddock, James .... Manchester.
Equal. { Marden, George .... Fareham.
Holmes, Charles Joseph .... Kingston.
Woolstencroft, Joseph ...... Northwich.
Griffin, Alfred William ...... Havant.
Hannaford, William .... Peterborough.
Watson, Horace .... Laceby.
David, John .... Newport, Mon.
Burn, Henry .... London.
Butler, William Harsant .... Frome.

The above names are arranged in order of merit.

* Passed with honours.

FIRST, OR PRELIMINARY EXAMINATION.

The Certificate of Examination of the undermentioned by the University of Cambridge was accepted in lieu of the Preliminary Examination.

Keeling, Charles James ...... Stafford.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The members of this Association inaugurated their connection with Anderson's University on the evening of Wednesday the 7th inst.; Mr. T. Davison, President, presiding. The attendance was very large. After the ordinary business had been transacted, Mr. W. R. Kermath submitted his motion, of which he had previously given notice, in regard to the compiling of a dispensing price list. The motion was seconded by Mr. David P. Walker, and carried unanimously. Twelve gentlemen were appointed a committee, with full powers to prepare a suitable price list to be ready for distribution at the next meeting of the Association. A new code of rules was then discussed and agreed upon.

The Fifth Meeting of the Session was held in Anderson's University on Wednesday evening the 14th inst.; the President in the chair. The usual business having been transacted, Professor Hennedy delivered the second of his course of lectures on 'The Histology of Plants,' which was of a very interesting and instructive nature. After the lecture the following gentlemen were unanimously elected honorary members of the Association, viz. Drs. A. M. Robertson and R. C. Moffat, James M'Donald, Esq., James Taylor, Esq., Robert R. Hatrick, Esq., and Roger Hennedy, Esq. A paper on 'Volumetrical Analysis' was announced for next meeting.

The Sixth Meeting of the Session was held in Anderson's University, December 21st. In the absence of the President, Mr. Brodie, Vice-President, occupied the chair. The minutes of last meeting having been read and approved of, Mr. Joseph Duncan, Ph.C., was elected a member.

Mr. James L. Macmillan then read a paper on "Volumetrical Analysis," which he treated in a very elaborate and painstaking manner. In course of his remarks he referred to the great need for every chemist being able to analyse his own drugs when required, owing partly to the fact that inferior articles were often sent into the market for sale, and partly because even in the best regulated houses mistakes occurred, and analysis was often the most convenient way of getting the matter cleared up. He explained at length the B. Ph. process, and described the method for making several of the solutions, also the apparatus required. After performing some experiments in testing, he drew attention to the value of the burette, and concluded by urging the younger members especially to practise analysis for themselves.

In course of a short discussion which followed, Dr. Moffat recommended Sutton's work on volumetrical analysis as being less complicated than that of the B. Ph. process, and better suited not only to the amateur analyst, but for all practical purposes in the laboratory.

The Chairman complimented Mr. Macmillan for the instructive manner in which the paper had been delivered, and proposed a vote of thanks for the information conveyed, which was heartily responded to.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Third General Monthly Meeting was held in the Rooms, Music Hall, on Wednesday, December 14th; Mr. WILSON, the President, in the chair. A lecture upon "The Laws of Heat" was given by an honorary member of the Society, W. Baker, Esq., F.C.S. It was of a very interesting and suggestive nature, illustrated by experiments, and elicited much applause. The following is a short abstract:—

Heat is only known to us by its effects. We are familiar with the sensation of heat; we observe that it causes a change of volume in matter, that it renders bodies luminous and so forth. Heat may be conveniently studied under two heads, absorbed heat and radiant heat. Sensible heat is measured by thermometers; but it must be borne in mind that what we really observe is the expansion of a liquid or gas in making use of such instruments, and the requirements for a good thermometer are not easily fulfilled. Allowance must be made for the expansion of the glass as well as the fluid it contains. The meaning of 212° Fahr. must not be lost sight of; it is really the temperature at which water boils under a barometric pressure of 29·905 at London.

The dilatation of solids, liquids and gases was noticed, and the superiority of air thermometers shown by the fact that the coefficient of expansion of all gases was practically the same; hence all air thermometers are comparable one with another. The applications of a knowledge of these laws of expansion were shown to be extremely numerous in the arts. The quantity of heat was measured in various ways, and constituted a separate chapter on heat called calorimetry. The combustion of a weighed quantity of fuel under water by means of a mixture of potassic chlorate was shown to raise a certain bulk of water so many degrees, and thus furnish a practical measure of its calorific value,—the unit of heat being 1 lb. of water raised from 32° to 33° Fahr. The change of specific heat upon compression was noticed and illustrated. The general facts attending liquefaction and solidification, and the effects of heat, stored up as it were in a liquid, were shown to have important effects upon our climate. One ton of water upon freezing was stated to give out sufficient heat to raise one ton of water from 32° to 174° Fahr. Development of heat upon solidification was illustrated by the sudden crystallization of a solution of sodic sulphate, which had been previously cooled in a flask; upon removing the cork the contents became a mass of crystals in a few seconds, and the heat could be observed by an immersed thermometer. Hope's experiment upon the changes of density of water near its freezing-point was mentioned.

The phenomena of evaporation, ebullition and the spheroidal condition of fluids were described. Conductivity of heat in metal bars was illustrated by attaching light balls by means of wax to the bars and heating the ends. The superior conductivity of copper over iron was thus easily perceived. Finally, the general laws of radiant heat were enunciated, and the effect of concentrating the radiant heat from a hot ball upon an air thermometer, shown to be very considerable at a distance of many feet.

At its conclusion a cordial vote of thanks to Mr. Baker was proposed by Mr. WILSON, seconded by Mr. DOBB, and carried unanimously. In consequence of the lateness of the hour no further business was done.

BRISTOL PHARMACEUTICAL ASSOCIATION.

On Friday, December 16th, the second monthly lecture of the current session in connection with the above Association was delivered by their Professor of Chemistry, THOMAS COOMBER, Esq., F.C.S. The subject was "Heat," and the following notes indicate the range and order of the phenomena treated of by the lecturer.

Introductory.—A current of electricity controls the position of a proximate magnetic needle. Such a current is established by the addition or subtraction of heat from two different metals in contact. This arrangement used in conjunction with the magnetic needle becomes therefore a thermoscope.

(1.) An experimental inquiry into the nature of heat.

(2.) Observation of the effects of heat upon matter. (*a.*) Change of volume. Experiments to study this change on solid, liquid and gaseous bodies. Thermometers. The Trevelyan instrument. Observation of the exceptional deportment of water. (*b.*) Change of temperature. Experiment to illustrate the dissimilar capacities of different bodies for heat. (*c.*) Change of physical condition. Latent heat of vapours and liquids. Effects of congelation.

(3.) Study of the modes by which heat may be transmitted. (*a.*) By conduction. Experiments to show that dissimilar bodies conduct heat at different rates, and that liquids are sluggish conductors. (*b.*) By convection. Experimental illustrations of this mode of transmitting heat. (*c.*) By radiation. It may be shown by experiment that heat travels in straight lines, that the angle of reflection is equal to the angle of incidence, and that dissimilar surfaces radiate at different rates.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.*

ON FERMENTATION.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture IV.

We had occasion last week to notice the effect of the atmosphere on processes of fermentation in several instances. I mentioned, among other things bearing on that question, an experiment of Gay-Lussac, in which he squeezed some very ripe berries of the grape under mercury, and kept them, with due precautions for the exclusion, as far as he knew, of everything except the grape-juice; he kept this expressed juice for some time quiescent, and then introduced a bubble of air, or a bubble of oxygen, the active substance of air, but he subjected the air or the oxygen, before introducing it into this juice, to various strong influences, which must have destroyed any vital organism in it; and he found that the mere addition of the air to the quiescent juice caused a process of fermentation to commence and a formation of organisms to begin, that they developed themselves, and that the liquid fermented in the usual way. The fact of the fermentation commencing is, if we bear in mind the general results of M. Pasteur's researches, to be attributed to the presence in the mercury or in the grape-juice, or somewhere or other in the substances present, of bodies which, by the mere access of oxygen, were stimulated so as to develope themselves into these little vital cells. It is now known, I may say, that there are in mercury, unless it is purified with extraordinary precautions, always present some such organisms, capable of developing themselves under such influences; and it is probable, I will not say more than that, for I do not know, that in the grape-juice there may also be similar germs present. The functions of oxygen appear from that experiment—which has since been confirmed by other observers—to be essential, at all events, to the initiation of the process, and there is, in that respect, a remarkable analogy, which I think is interesting to recall to mind, with the action of oxygen

* Cantor Lectures.

on other bodies, as shown by an experiment made by Humboldt many years ago. He got some grains of wheat from Egyptian mummies, which had been so long at rest that they were not inclined to grow, in fact, they could not be got to grow in the ordinary way. However, he stimulated them to activity by immersing them in a little chlorine water. It is well known to chemists that chlorine in the presence of water does oxidize, or cause the oxygen to separate and pass over to common organic substances capable of combining with it. Humboldt actually stimulated these sleepy wheat grains to life, so that they grew and germinated, and their descendants are still in existence, by the mere action of oxygen developed in that way.

In the processes of wine-making and wine-keeping, the presence of air is one of the most important matters which have to be considered, and there has prevailed, and I ought to say there still prevails, to a certain extent, a difference of opinion regarding the functions of oxygen in these processes. On the one hand, it is known, as a matter of fact, that processes of fermentation are performed under conditions such as that air has access to the substance. No actual wine or beer-making has yet been performed on a large scale on such conditions as to exclude oxygen. On the other hand, the experiments of Gay-Lussac established clearly that it is necessary. In some cases, however, in wine-making, it has been thought desirable to facilitate the access of air to the substance; while other wine-makers think, on the contrary, that in the first process as little air should be present as possible; but there has always been some. The juice first expressed from the grapes has been very carefully examined with regard to the gases contained in it. If air has access to it, it is always necessary to know, in order to judge whether the air acts upon it, whether the air is dissolved by it, and whether, if dissolved by it, it is still to be found in the grape-juice as such, or whether it has undergone combination. Now, every case of the examination of must, or fresh grape-juice, which is not fermented, has shown that it contains a considerable quantity of gas, but no case has been established of free oxygen being present in it. Carbonic acid gas is present in it in a considerable quantity, and also nitrogen, in proof that air had had access to it, but the oxygen which was taken up at the same time with the nitrogen from the air, was not to be got out from that must again. It had been taken up, and it had entered into combination with the substance, so that all the oxygen present was actually combined chemically with it. In that respect a good many observations have been made by various chemists, but I ought especially to quote those of M. Pasteur, which are exceedingly careful and valuable. He has shown that this substance not only eats oxygen, but digests it. The oxygen is not to be found in it as such. It is only present in the form of a compound, which is formed by its action on the organic matters there present. Then, when the wine-juice has been expressed, and when it has been allowed to remain some time in a suitable place, so as to undergo fermentation, with a considerable variety of treatment in different places with regard to air, for in some places it is thought desirable that the fermentation should be allowed to take place in open vessels, or in vessels to which the air can have access as freely as possible, whereas in other cases special care is taken to cover as completely as possible the vessels in which the fermentation is taking place, so that the air may have as little access as possible to the fermenting substance,—and I believe it is impossible to give any one general rule with regard to the best process for all cases of fermentation, because the materials which are subjected to fermentation vary so considerably; they differ from one another in their composition so materially, and there are also other circumstances which are different,—for instance, the temperature, which has an important influence. Not only is the temperature in some localities higher than in others, but other circumstances are also different, and it would not be right to say, because air is found to be perfectly useless in some well-established cases during fermentation, that for that reason, it ought to be excluded, or even that it may be excluded, in all other cases of apparently similar fermentation. As far as a general rule can be laid down from present experience, I think it does appear certain that oxygen plays no part in the process after the first expression of the juice. Once the fermentation has commenced, it appears to go on as well if air is excluded from the substance as if air has access to it. There is, however, one circumstance which is considered by persons of considerable experience to be important in this matter, and which I ought therefore to mention, viz., that when fermentation takes place at a low temperature—and some fermentations are, with great care, kept at a low temperature—the products are found to be superior if the whole process is carried on, the temperature being kept exceedingly low, and in those cases it appears that an open vessel is certainly not in any degree detrimental. It is customary, in fact, to use an open tub when the temperature is low; and, on the contrary, it is usual to use a partially closed vessel, of course allowing for the escape of carbonic acid, when the temperature is comparatively high. When the first vinous fermentation has completed itself, it is customary, in the wine-growing countries, to put the still active liquid into casks, and the slower process of fermentation then goes on, which lasts a considerable time. During this second fermentation, there is very much the same kind of condition present as in the first, and there is always formed, in this subsequent fermentation, a considerable quantity of deposit, which is afterwards removed with much care; either the supernatant liquid is carefully decanted, or, in some cases, it is removed by a process of rough filtration. The subsequent treatment of the wine, I mean the keeping of it in casks or cellars, and the subsequent keeping in bottles—and these two processes of keeping it in casks and keeping it in bottles are quite distinct,—are not usually considered as forming part of the process of wine-making. It appears, however, from the investigations of M. Pasteur, that changes take place in the composition and the materials by these processes, which really are as essential to the composition of the product as any other part of it, and that they ought to be considered as later parts of the process of wine-making. In fact, the process of wine-keeping is, in theory, not to be separated from the process of wine-making, the keeping being a process making it more perfect than it was when first turned out of the fermenting vessels. Common experience corroborates that in a very remarkable way. Everybody knows the difference there is between new and old wine, and the changes which take place when the wine is being kept constitute certainly one of the most important parts of the general subject of wine-making. Wine, when its fermentation has been completed, is found to absorb air with considerable rapidity and avidity, and when endeavours are made to get out from this wine again the air which has been dissolved in it, it is found that some kinds of wine allow it to go, or part with it again, whilst other wines do not; and in this respect, a distinctive test is found between the qualities of the wine; for by observing this difference in the facility with which they give up the air which they have dissolved, and by comparing that with the qualities of wines in each case, a remarkable generalization has been arrived at. In this matter I speak upon the authority of others, for I have not confirmed it by my own observations. But all that I do know fully corroborates it. The rule is this, that whereas low-class wines, which people will not pay much for, give up again almost completely the air which they have dissolved, superior kinds of wine do not give it up again, they only give up the nitrogen, and hold the oxygen fast. The oxygen, which is dissolved in both cases, is held firmly, or is digested by the high-class wines; but it is not digested, but simply eaten by low-class wines. Observations have been made in this direction by a great many observers, especially Berthelot and Pasteur, to whom we owe most decisive results in this respect.

(*To be continued.*)

MEETINGS FOR THE ENSUING WEEK.

MONDAY, *Medical Society*, at 8 P.M.

WEDNESDAY, *Pharmaceutical Society of Great Britain*, at 8.30 P.M.—Adjourned Discussion on Mr. Howden's paper, "Notes on Pharmacy in America."—"Notes on Australian Opium." By J. S. WARD.

BOOK RECEIVED.

A LABORATORY TEXT-BOOK OF PRACTICAL CHEMISTRY, OR INTRODUCTION TO QUALITATIVE ANALYSIS. A Guide to the Course of Practical Instruction given in the Laboratories of the Royal College of Chemistry. By W. G. VALENTIN, F.C.S. London: John Churchill and Sons. 1871.

Parliamentary and Law Proceedings.

ATTEMPTED POISONING BY A "VERMIN KILLER."

At the Norfolk winter assizes Hannah Willmet was charged with administering poison to the infant child of her master. It appeared that her master had purchased some "vermin killer," which he had carefully put away out of the reach of his children. The prisoner obtained possession of this, and administered some of it to the child. She confessed to putting her finger into the mixture, and then putting it into the child's mouth. She said that she wished she had not done it, but that if there had been no addition to the family she would have been better able to do her work. The infant's mouth was wiped by its mother with a piece of rag, which was deeply stained with blue.

Mr. Sutton, analytical chemist, Norwich, by whom the jar of vermin killer and the rag had been examined, said that he found phosphorus in both. The mixture in the jar consisted of phosphorus, fat and malt flour, containing about one part in forty of phosphorus.

The prisoner was found guilty, and sentenced to six months' imprisonment.

Obituary.

We regret to have to announce the death of Mr. T. W. GISSING, Pharmaceutical Chemist, of Wakefield, which took place after a few days' illness, on Wednesday, the 28th inst. Mr. Gissing was one of the gentlemen nominated at the last election of Council, and a letter from his pen on the Poison Question appeared in this Journal as recently as last week.

The following journals have been received:—The 'British Medical Journal,' Dec. 24; the 'Medical Times and Gazette,' Dec. 24; the 'Lancet,' Dec. 24; the 'Medical Press and Circular,' Dec. 28; 'Nature,' Dec. 22; the 'Chemical News,' Dec. 23; 'Journal of the Society of Arts,' Dec. 22; 'Gardeners' Chronicle,' Dec. 24; the 'Grocer,' Dec. 24; the 'English Mechanic,' Dec. 23; the 'Produce Markets Review,' Dec. 24; the 'Philadelphia Medical and Surgical Reporter,' Nos. 716–718; 'Vierteljahresschrift für Praktische Pharmacie' for December; the 'Food Journal' for January.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department,* 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[63.]—GREEN FLUID FOR SHOW-BOTTLES.—I beg to offer a good form, inexpensive and easily made.

Cupri Sulph. ℥i.

Rub down in mortar and add liq. ammoniæ *fort.*, q. s., at once a very dark blue will be produced; then add aqua to a suitable colour. Add a little potass. bichrom. if a green is required; lastly filter.—CHEMICUS.

[75.]—DECAYED TEETH.—Ol. Caryoph. with a few drops of ac. nitric. pur. Mix well and apply on wool.—CHEMICUS.

[77.]—DISPENSING.—It is impossible for "*Exhibeatur*" to make his mixture otherwise than milky, but he will find, on allowing it to stand for an hour or two, after dispensing it in the ordinary way, that the precipitate will re-dissolve and it will become quite clear.—A. CARTER.

[102.]—CIVET, AMBERGRIS AND CASTOR.—*F. C.* will, I think, find in Rimmel's 'Book of Perfumes' detailed information about civet and ambergris. The imports of these are very small; of ambergris in some years none at all, and in others about a hundred ounces. Castor is the only one of the three enumerated officially in the Board of Trade returns of imports. We received in 1869 2408 lb., valued at £742, nearly all from the Hudson's Bay territories in North America.—P. L. S.

[111.]—YLANG-YLANG.—"*Utile,*" in answer to "*Chemicus*" in No. 22, gave an excellent recipe for a lasting perfume containing "ylang-ylang," the composition of which is greatly desired by ALPHA.

[112.]—HORSE AND CATTLE SPICE.—*W. R.* (Scarborough) would be glad of a good recipe for horse and cattle spice for feeding purposes.

[113.]—DISPENSING.—Will some of your readers kindly inform me the best mode of dispensing the following prescription, and if it is possible to get a mixture of decent appearance?

R. Liq. Hydrarg. Perchlor. ℥ij
Potassii Iodid. ʒij
Tinct. Quinæ Co. ℥iss
Syr. Aurant. ℥j
Aquæ Dest. ad ℥vj.
M. ft. mist.

S. D.

[114.]—ARECA NUT TOOTH-PASTE. — "*Scilla*" would be glad to hear of a good formula for this tooth-paste.

[115.]—MARKING INKS.—I shall be glad to be informed of the best method of preparing and using aniline marking ink, and to know whether it effectually answers the purpose. Also the cause of carefully prepared silver inks making holes in the fabric, this being sometimes asserted.—Q.

[116.]—DISPENSING.—I wish to learn the correct method of dispensing the following prescription, and also what appearance it should present:—

R. Ferri Citrat. ʒj
Sp. Ammon. Ar. ʒiv
Potass. Bromid. ʒiv
Aq. ad ℥ij.
M. f. guttæ.

Capt. coch. j min. bis die ex aq. cyatho vinario.

I suppose it is unnecessary to remark that the *ammonio-citrate* is not intended; this I know for certainty, as the prescriber is, I understand, in the habit of frequently writing a similar prescription.—F. G. G.

Correspondence.

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

Proposed Regulations for Storing of Poisons.

Sir,—The Council having determined by a majority of 10 to 4 to recommend to the members at their next annual meeting the adoption of the proposed regulations for the storing of poisons, it now remains for the members themselves to give expression of approval or otherwise in the Journal or by letters to the Secretary. Messrs. Vizer, Wilkinson, Eve and others have already done so. The present manifestation is decidedly against the compulsory adoption of any regulations; and believing, as I do, that this feeling will be found very general throughout the country districts, there need be no unseemly exhibition at the annual meeting as some of your correspondents seem to imply; but a simple resolution, either to modify or negative the recommendation of the Council, would, no doubt, meet with the support it deserved. There seems to be an impression that the Privy Council expect the Council to take some action respecting the storing of poisons. However, I cannot think that either the Pharmaceutical Council or the Privy Council would interpose any obstacles to the generally-expressed opinion of the members. I concur with much that has been said in favour of non-interference; the educational legislative measures already obtained and self-interest are sufficient guarantees to ensure every precaution being taken to avoid mistakes.

Another Pharmaceutical Chemist.

Sir,—I am sorry to see from the report of the proceedings of the Council that the majority think it necessary to compel Pharmaceutical Chemists to keep poisons in certain places set apart for that purpose or in distinctive bottles, and I want to know the reason why. Have any deaths occurred or has any injury to health been recorded in Great Britain since January 1st, 1869, which would have been prevented by any regulations for storing poisons? I am inclined to think the Council have no stand-point from which to start their proposition.

I read the Journal regularly and the daily papers, and I do not recollect one instance within the last two years where the proposed regulations and restrictions would have been of any use. If before the passing of the Pharmacy and Poisons Bill many deaths were caused through the negligence in storing and carelessness in selling poisons, the present fact that such accidents have been reduced to a minimum, if not to *nil*, since the Act came into force, appears to me to be a most forcible argument to "let us alone." We chemists require no "hard and fast line" drawn for us in this matter. If we find the bottles containing crystals of citric acid and sal acetos. hugging each other, we naturally and prudently forbid the close connection; we do not keep our tinct. opii bottle by the side of haust. nigr., decoct. sarsæ co., or tinct. myrrhæ co.; we do not store strychnia, morphia *et id genus omne* in similar bottles and on the same shelf with p. antim. co., hyd. subchlorid. and antim. tart. In a business like mine, we do not keep our penny packets (pennyworths we are obliged to sell) of precipitate, red and white, in the same drawer with jalap and rhubarb, or Epsom salts near oxalic acid, or sugar of lead and cream of tartar in close proximity. We know better, and we act upon our knowledge and experience, because it is our interest to avoid the penalties which must fall upon the careless and ignorant.

I am one of those who think we owe much to the gentlemen of the Council who devote their time and intellect to the management of our affairs, and in most matters connected with our Society are well fitted to lead and guide; but on this subject I am so entirely opposed to them, that I have ventured to intrude my opinions on your notice.

December 21st, 1870. James Slipper.

Sir,—Will you allow me a few remarks with regard to the keeping and storing of poisons? I quite agree with the sentiments contained in Mr. Hampson's letter. I presume it is the feeling of the majority of our brethren that the improved education now demanded is a sufficient safeguard to the public, and that each chemist should be guided by his sense of responsibility.

In my own case I have always used precautionary measures, and did so many years before the Pharmacy Bill passed, and I am sure it was the usage in all respectable establishments in my locality.

If it is true that the Government are putting a pressure on the Council of our Society, I should like a member of the former to visit our town, containing a population of half-a-million, where fully one-half of its drug retailers are surgeons; it would show him (after inspection) the folly of adding or desiring to add vexatious restrictions upon properly-qualified men, and exempting those who are allowed to manage their businesses as they think fit, leaving them the greater part of the day under the care of boys and girls, who cannot be expected to adhere to the requirements of the Pharmacy Act, or feel its responsibility.

I am justified in saying that mistakes are necessarily numerous. It therefore seems to me odd that such a state of matters should exist. If a surgeon or doctor wishes to become a druggist, why should he stand exempt from our penalties and restrictions? We must of necessity employ well-paid assistants to take charge in our absence; should they not be compelled and expected to do so likewise, if the public are to be protected? Until the Privy Council begin to use the right end of the rod, it seems to me absurd to push the matter further so far as the city of Glasgow is concerned.

Glasgow, December 21st. Pharmaceutist.

Sir,—The storing of poisons being again an object of discussion, allow me to recommend to the members of our Society the expediency of avoiding any very loud expression, either of assent or dissent, to any proposals put before them.

Views expressed through the medium of the Journal or circulated among ourselves as a body, would be much preferable to any open demonstration.

The public is often slow in arriving at facts where legal questions are concerned, and might feel disposed to view those who support measures for regulating the storage of poisons as supporting regulations for "incapables;" at the same time those who are noisy in advocating resistance to any regulations whatever might be thought reckless.

Chemists have certainly some claim to exemption from forced details in business which are not absolutely necessary, for what with the Poison Act, the Petroleum Act and the Excise supervision, quite sufficient is known of the "powers above."

To ventilate our grievances too much before the public would be a confession that hitherto all our rectitude had been a matter of chance, and public alarm would follow. We have some anomalies in the sale of poisons which our customers cannot at present comprehend, and to attract further public attention to what we ourselves at present confess to be a chaotic state would be suicidal, so far as our reputations go. The necessity for fresh "leading-strings" would not confirm our supporters in an opinion that we were capable of running alone.

It must be expected that opinions will diverge here as elsewhere, but the less they diverge into public notice, the better for us.

It is unfortunately a position which none can envy us—that of being repeatedly told that we cannot manage our own professional affairs after the sacrifice of time and money in attempting to learn how so to do; but if we let our friends outside know our grief, we shall be only extending our troubles rather than settling them.

M.P.S. (by election).

Brighton, December 24th, 1870.

Sir,—The regulations for storing poisons, scheduled by the recent Pharmacy Act, 1868, are now so much simplified that no reasonable person can complain of their being oppressive, or unduly interfering with the dispatch of business or requirements of trade.

I would suggest that each individual should look at the question from a broad point of view, and not as affecting any particular branch, adapting the regulations to the best of his ability, according to the circumstance of each case.

What can be easier than for the retail chemist who has a cupboard in the shop or wareroom where he probably already keeps strychnine, aconite, atropine, cantharides, prussic acid, etc., to add in addition to the name of the article in the vessel a distinctive label such as I have enclosed, with the word "*Toxicum*" written or printed legibly on a plain gummed label, placed on a larger piece of pink capping paper, showing a border beyond which must strike the eye, and attach a band of glass paper to the ends of it, going round the back of the bottle, or vessel, just above the bottom, where the hand would take hold when required for use?

Here there would be two safeguards at once, a distinctive white label on a red ground in front to catch the eye, and a rough surface detected by the touch.

These precautions may be adapted to large or small packages, either in the cupboard, on the shop shelves, or in warerooms; and where bottles or packages are not in every-day use, an additional precaution of tying over, or fastening down by a simple contrivance, would obviate every difficulty, put an end to this unseemly controversy, and meet the requirements of a wholesome regulation.

This inexpensive method every chemist can at once carry into effect for himself, by the aid of pen, paper and gum pot.

I trust our brethren will be unanimous, and adopt the regulations in a spirit of fairness; for captious resistance will inevitably lead to further legislation on the subject and enlargement of the schedule of poisonous articles.

A FOUNDER OF THE PHARMACEUTICAL SOCIETY.

Dec. 24th, 1870.

Sir,—As this poison question is again being brought prominently forward, I should like to be permitted to state in the columns of the Journal my own personal experience in reference to this subject before and after adopting precautionary measures in the storing, keeping and dispensing of poisons.

I have always felt one of the greatest drawbacks to the profession of pharmacy to be the possibility of some very serious mistake being made in the dispensing of dangerous drugs and chemicals, even when carried out by thoroughly qualified assistants. This always pressed heavily and unremittingly upon my mind before adopting precautions. But some six years since I separated the most dangerous of these medicines, such as strychnine, aconitine, hydrocyanic acid, liq. arsenicalis, and placed them in a small lock-up case, with each article distinctly labelled "poison;" whilst to the preparations of opium, morphia, and tr. belladonnæ and analogous drugs, I used caps of india-rubber, which from their elasticity required no fastening, and marked each cap with the word "poison." I can with truth say that considerable relief accrued to my mind from a conviction that an additional element of security against mistakes had thus been introduced.

Probably most of my brother pharmacists have more or less felt oppressed by our great responsibility, especially in connection with the dispensing of poisons; I believe this simple precaution would relieve them as it has done me from a considerable part of this, and frequently prevent the occurrence of serious mistakes; whilst at the same time it would meet the wishes of the Council, to whom surely some deference is due, composed as it is of some of the leading men connected with the Pharmaceutical Society, as well as being a representative body.

Of the other alternate proposals, viz. 1st. A separate compartment for dangerous articles, it is evident that this is next to impossible in a great many small shops for want of space. Or 2ndly. Distinctive bottles or vessels would involve considerable outlay, which would press heavily in businesses where the returns are small and inadequately remunerative for the skill and labour employed, which is unfortunately too often the case.

Edinburgh, Dec. 26th, 1870. H. C. BAILDON.

Sir,—As a very old member of the craft, allow me to say one word on the subject now agitating it. I do not see anything very hard in our being obliged to submit to such simple regulations as were last set forth by the Council, in itself. But I do see something very hard, very unjust, and contrary to the spirit of fairplay, so much loved by all Englishmen, and which is such a characteristic of English legislation, if all persons who dispense poisons are not equally compelled to submit to the same regulations. If there is to be one law for one class of her Majesty's subjects, and another law for another class, then I would oppose the Council's action through thick and thin.

If the Council will only seek to extend their regulations to all persons alike, without fear or favour, they would disarm a great deal of opposition.

Manchester, Dec. 27th. A LOVER OF FAIRPLAY.

Sir,—The above subject is of so much importance to us as a body that I will not offer an apology for asking you to grant me a small space for a few remarks, which I hope may be regarded as relevant to its discussion.

The whole subject appears to me to be embraced in the following questions:—(1.) Are these proposed regulations needed? (2.) Under what circumstances is it sought to impose that which is justly regarded as an unwise interference with an arrangement which has hitherto worked well? (3.) If we adopt the course which appears favourable to our parent Society, and reduce ourselves to the position of mere automatons, requiring no thought or consideration in the execution of our duties, shall we under this proposed new order of things, in the event of error, still be responsible and liable to damages? Finally, if these regulations eventually come into force, will it tend to elevate us in the estimation of the thinking public?

First, I will endeavour to prove that they are not needed. If these innovations are meant to prevent poisoning by misadventure, it seems to argue that this calamity is of frequent occurrence; but is this so? I think not. Indeed, so seldom does it happen (and, be it remembered, that we have no means of sheltering ourselves behind a curtain of obscurity), that when a case is brought before us we stand aghast, and inquire, How did it occur? Very rarely indeed by the chemist in compounding his prescriptions, as he becomes, by force of habit, a thoughtful and reflecting man, well knowing his great responsibilities, and as a rule is most conscientious in the fulfilment of his duties. It may more frequently be traced to the unwise parsimony of medical men, who order liq. strychniæ to be taken in five-drop doses, and thereby make the uninformed public their own dispensers, with what result I need not say. Facts are stronger than theories. Considering the number of potent poisons which many of us have daily to manipulate, our various duties interspersed with interruptions which often annoy, it argues much for our present order and arrangements, combined with energy and concentration of mind, that a less number of accidents could not occur, unless we were suddenly to arrive at a state of perfection; but, as this condition is not common to man, I take it that we are not likely at present to attain this point.

Secondly, the time for introducing this arbitrary measure appears most unfavourable and inopportune. If chemists, as a whole, were less competent in their particular sphere than other tradesmen or even professional men,—or if they, being incompetent, set their faces rigidly against reform, or persistently refused any measure which would tend to increase the public confidence; or, if poisoning by misadventure were of more frequent occurrence than formerly,—there might be a colouring of plausibility for thus introducing a measure which, to say the least, will be exceedingly onerous and excessively distasteful. But, if we look calmly into the facts, we shall soon perceive the very opposite of that which I purposely placed in the subjunctive mood. Who were most anxious for the passing of the Pharmacy Bill of 1868? The chemists, Sir. Who were most anxious that this Bill should be complete and effective, and the standard of education such as would entitle us to the respect of all? The chemists. To whose interest is it that all our plans should be well matured and well arranged, promote unity of action, cohesion and strength, and thereby avoid our greatest enemy—internal dissension? I say again, the chemists. While I believe that the Pharmaceutical Society are especially desirous of watching over our interests, and doing all in their power for our united good, I do hope that their great zeal will not lead them into the greatest of all errors, viz. that of doing too much.

Thirdly, the chemist must always be inevitably responsible to the public for the manner in which he conducts his most important duties. But, may I ask, is it wise to attempt to introduce any measure which will have for its object the simplifying (or more properly mystifying) of our present arrangements, and which will necessitate engrafting a new set of ideas upon our dull sensibilities? If this plan should be enlarged upon, we may soon find that, instead of labels to our bottles, we shall have to learn that a bottle with one angle means one thing, with two angles another, three angles another; and when our angles are exhausted, we shall fly to colours as another order of insignia, until the public will begin to doubt whether beings with such peculiar tendencies, and grotesque ideas, are quite the proper persons to trust with their lives; and some of our dear friends, who envy our wealth because of our overcharges, will not forget to point out to their patients, who pay them for their physic as well as their advice, that these changes have been considered necessary by the authorities, in order, if possible, to avoid the many and fatal blunders into which we are so constantly falling.

Finally, if we allow this measure to pass without raising our voices in opposition, and showing clearly and logically the ground of our objection, our moral and intellectual force must be weak indeed; and the public will not be slow to learn that those who exhibit such inability to manage their own affairs must be equally incompetent to undertake, and carry on successfully, the important interests of others.

Although I have gone over this subject very superficially, I fear you will regard it as extremely prolix; yet I beg you will accept it, with all its faults, as an earnest conviction of one deeply interested. NEMO.

INFORMATION WANTED.

Sir,—In answer to *E. B.*, p. 520 of your last Journal, I beg to state that magnes. ferri et quinæ sulph. is composed of 1 gr. of sulphate of quinine, 3 grs. sulphate of iron, and 16 grs. of sulphate of magnesia in each 20 grs. of the compound salt. G. S.

Renfrew, December 29th, 1870.

Sir,—We perceive in the Journal of the 24th inst. an undated and anonymous communication wherein our name is introduced as having compounded a prescription containing "Mag. Ferri et Quin. Sulph." and evidently treating it as a nostrum of our own.

The prescription in question was sent to us a short time since by a customer, to be dispensed. Not having the foregoing preparation, we wrote to our firm in Bruton Street, Berkeley Square, to procure it, which they did, at the Apothecaries' Company in Berners Street.

We now beg to make the following remarks: some individual (evidently "*E. B.*") went to our establishment in Bruton Street, last week (we believe on the 21st), and asked if they had a preparation of magnetic iron and quinine; he was told they had not; he then produced the identical prescription we had made up at Oxford, and was politely told it was a compound of the sulphates of magnesia, iron and quinine, and where he could obtain it; we were therefore extremely surprised to see his uncalled-for letter, especially as it is our invariable practice to give every information which may be desired of us.

It is evident that your correspondent has a sinister motive in view, for after taking the trouble to translate the prescription for him, which he was unable to do, and to tell him where he could procure the medicine, it is too bad that he should drag our names in such an invidious manner into print.

Oxford, Dec. 27th, 1870. HITCHCOCK AND SONS.

[*** The letter of our correspondent *E. B.* was inserted at the moment of going to press, and under the belief that it was a *boná fide* request for information. We do not now perceive that it was otherwise, or that there was any intention to annoy Messrs. Hitchcock.—ED. PH. JOURN.]

PHARMACY IN IRELAND.

Sir,—In their efforts to secure rights analogous to, and a basis as nearly as possible resembling, that which governs the Pharmaceutical Society of Great Britain, the Chemists and Druggists' Association of Ireland would deem it a favour if the members of that Society, individually or as a body, if occasion require, would exercise their influence with members of Parliament on the introduction into Parliament of the draft Pharmacy Act of the Apothecaries' Hall Company of Ireland. We look on the said Draft Act, as at present compiled, as unjust,—a barrier to the future progress of our Association, in its ultimate working a monopoly, and in no way likely to supply the grievous want so ably filled by the Pharmaceutical Society of Great Britain.

The importance of the subject to us, Sir, will be, I trust, a sufficient excuse for trespassing so much on your valuable space.

HENRY FLINT.

Laboratory, 108, *Patrick Street, Cork.*

A POINT OF ETHICS.

Sir,—"*Chemicus*" will be good enough to remember that the point at issue is not the mode of dispensing prescriptions containing morphia, etc.

He has not yet disproved the assertion that acid. sulph. dil. is not to be added to a mixture containing quinine unless specified.

There are eminent medical men here and elsewhere that frequently specify that the quinine is not to be dissolved unless specially ordered.

Bath, Dec. 27th, 1870. D. T. W.

Sir,—With reference to the prescription alluded to by "*Magnesia,*" I see that "*Chemicus*" still adheres to his assertion that the medical man forgot to add the acid. sulph. dil., and as proof is wanting, I think it best to give him the benefit of the doubt; but I quite agree with you that your correspondents were not justified in adding acid. sulph. dil.

If such was allowable, it would produce a rivalry amongst dispensers, as to who could supply the same medicine so as to present the most elegant appearance, regardless of the wishes of the prescriber or the comfort of his patients. I quite agree with "*Chemicus*" that a dispenser is justified, and in duty bound, to use his discretion in compounding a medical man's prescription (for medical men, like ourselves, are often pressed for time, and a slip of the pen might be productive of serious results); but he has no business to touch it up to suit his own fancy, and if any alteration be necessary, it is his duty to refer to the medical man. About a month ago the following prescription was handed to me to be dispensed, and was supplied accordingly:—

℞. Potassæ Chlor. ℈ij
Quinæ Sulph. gr. viij
Acid. Sulph. Dil. ʒi
Syr. Limonis ℥j
Aquæ ad ℥viij
M. ℥j 4tis horis.

When the medicine was finished, the same person brought the empty bottle and presented a prescription containing the same ingredients as the above, minus the acid. sulph. dil.

It immediately occurred to me that the acid had been forgotten, especially as the medical man sometimes prescribed acid. citric. with chlorate of potash and quinine, but as I had not an opportunity of referring to him, I felt bound to dispense the prescription as ordered, and of course I did so.

A few days after I happened to mention the circumstance to the medical man, who told me that he omitted to add the acid, as his patient complained of the medicine causing irritation of the bowels, and that the omission had produced a satisfactory result.

Imagine the annoyance of the medical man and the discomfort of his patient if I had presumed to act upon the suggestion of "*Chemicus of twenty years' standing.*"

Darlington, Dec. 26th, 1870. J. SWENDEN.

DISPENSING CHARGES.

Sir,—There can be no doubt that the plan proposed by "W. Wilkinson" in last week's Journal is most valuable, and would tend to lessen the great evil of different charges for the same prescription when dispensed at different shops; but still I fancy it would meet but half the difficulty. I have been in business for over twenty years, and in a town of about 7000 inhabitants. There are two chemists besides myself; often they undersell me and as often I undersell them, not intentionally on my part, and I am willing to believe not on theirs; but how is it to be avoided? For all trade communication between us we might as well live fifty miles apart: and I see no chance of effecting a better state of things till all in a town or district will agree to meet, say once a month, and, sinking all petty jealousies, talk over business matters in an amicable and friendly spirit. If this could be brought about, I am sure the evils so often complained of in your Journal would be much lessened.

Just to give an example of low charges. Some time since a commercial traveller (in the drapery line) brought me a prescription for an 8 oz. mixture, and on calling for it a little time afterwards, put down a shilling on the counter. I said I could not possibly charge less than 1*s.* 6*d.* for it. "Oh," said he, "I never pay more than a shilling." I insisted on the fairness of my charge, and the result has been that from that time I have dispensed but very few prescriptions from the hotel at which he was staying (the leading one in the town), whereas before I continually did so.

GREY HAIRS.

Bridport, Dec. 17th, 1870.

Sir,—The price-mark recommended by the Manchester Chemists' Association, and a dozen others adopted by leading firms, seem to have two defects, which should be supplied previous to general adoption. There is no "repeater," nor any provision for expressing the cypher. The letter "W," naturally suggesting the idea of reduplication, answers well as a repeater, and the cypher may be expressed by any letter not otherwise used.

I would, however, suggest two alternative schemes. There is a system of artificial aid to memory, somewhat extensively known in schools, which makes use of all the consonants. It has the advantage of various letters to express figures above five. I append the system.

1	t	Consisting mainly of *one* stroke.
2	n	" " *two* "
3	m	" " three "
4	r	Fourth letter of *four*, which has *four* letters.
5	l	In Roman numerals suggests *five* decads.
6	d	Supposed to resemble a reversed six.
7	c g k q	The "K" sounds.
8	b h v	Consonants in "beehive." H is the *eighth* letter of the alphabet, and its name suggests sound of *eight*.
9	p f	Consonants above and below the line.
10	y	Has a *two*fold connection as consonant and vowel, and represents *two* figures.
0	s x z	A circular figure, represented by letters suggesting sound of circle, cipher and zero.
	w	Repeating whatever letter has preceded it.

The Greek method of notation recommends itself by its classic use, as distinct from a merely fanciful scheme, and its exposition would be found in any Greek grammar. It is to be regretted, for the sake of the general benefit resulting from its study, and especially because it is the language *par excellence* of scientific nomenclature, that all chemists are not fairly acquainted with the Greek language; it would, however, require a very slight effort on the part of such an intelligent class to acquire a dozen characters. If desirable, shillings might be expressed by capitals, and pence by small letters, avoiding the intervening stroke, and the appearance to the public of a price.

HENRY H. POLLARD.

Ryde, I. W., December 20th, 1870.

OBSCURE PRESCRIPTIONS.

Sir,—I have perused with peculiar interest the correspondence and your remarks thereon which have appeared in the late numbers of the Journal respecting the obscure writing of physicians and surgeons. Having had very considerable experience—much more than falls to the lot of most men—in a large dispensing house in London, I can with some authority bear testimony and endorse all that your correspondent, "*M.P.S. by election,*" has advanced with reference to the slovenly and loose manner in which the great majority of medical men are in the habit of writing their prescriptions, which in justice to the patient, as well as to the dispenser, ought to be clearly and distinctly written. To my mind it is all fiddle-faddle about the "Latinity" of the prescription; it matters not to the patient if some of the terminations are written *ā* when they should be *æ*, or if there should be one or two *i*'s. It is not as if every prescription written was to be subjected to the criticism of an Oxford professor. Any one can understand what is meant by tinct. belladon. Never mind the termination; the all-important thing to be observed by the writer should be that when he orders tinct. belladon. it is so clearly inscribed that it cannot be mistaken for anything else by the dispenser. With respect to the gross blunders occasionally made by even the most eminent medical men, I have seen very many, some of which would have proved fatal to the patient at the first dose had the prescription been dispensed as actually written. What would be considered trifling errors or omissions, such as quantities left out, vehicle not mentioned, pills no number, and many other little inaccuracies, I found of almost daily occurrence.

A few words respecting the possibility of a case occurring when it would be of importance the patient should not be cognizant of the drugs he is taking. I have had many applications from medical men to suggest some means by which this might be overcome. As an instance, a lady had been taking for some time "liq. Fowleri" and with great benefit unfortunately one day she pushed the question as to what this "Fowleri" meant. Very reluctantly I told her it was a preparation of arsenic; nothing could persuade her afterwards to continue its use from the fear of being poisoned, as some one had told her that arsenic was cumulative in the system. In another instance, a gentleman travelled some sixty miles from the country to consult a medical man in London; two names having been submitted to him by the local apothecary, he called on me and asked my opinion which of the two I considered best. They both happened to be of equal calibre, so I told him he could not do wrong in consulting either, the one in the City and the other at the West-End. He returned in a few hours and presented me with the City doctor's prescription, at the same time observing he was not satisfied. He desired me to read over the articles prescribed (he is a dabbler in physic); having done so, he asked my opinion, what should I consider the ailment of the patient? I unhesitatingly told him, judging from the general run of prescribers, it might be for a slight cold, etc., as it would induce perspiration, etc. (it was composed of pot. nit., vin. ipecac., liq. amm. acet., mist. camph. and also a mild aperient pill, h. s.). He took the prescription from my hand, remarking he was sure from the questions asked, the doctor knew nothing of what he was about, also that none of the ingredients ordered ever suited him; at the same time, to my surprise, handing me another prescription, written by the West-End doctor, desiring to be informed what he had ordered. When I told him it was a very mild dose of "strychnine" and other things he would not hear anything more about it, as he assured me he was determined, if possible, to die a "natural death." The most laughable part of the story remains to be told; he then asked me to prescribe something for him: this I politely declined, telling him if he was not satisfied with the advice of two eminent doctors, mine would be of no service to him. In both these cases, had it been possible to keep from them what drugs they were taking, both might have been benefited. It must not be supposed I could advocate the plan adopted by Mr. Bradshaw, nothing can warrant such practice; a patient consults a doctor and pays his guinea for the prescription,—if he refuse to take the medicine prescribed because he objects to some particular ingredient or otherwise, it is his own business, but the prescription itself ought to be as plainly written as A B C, and in accordance with the B. P.

W. M.

St. Lawrence, Ramsgate, December, 1870.

G. W. Fox and Co. (Birmingham).—We have just received a long letter from these gentlemen, which we are prevented from inserting by the pressure on our correspondence columns. It will, however, receive early attention.

H. Machon (Saffron Walden).—A still must be paid for unless the Inland Revenue authorities give exemption, as they have sometimes done, when it has been shown they can do so without risk to the Revenue.

Nemo (Wolverhampton).—See "Answers to Correspondents," *G. A., ante*, p. 180.

Frank Adams (Stoke-on-Trent).—Yes.

A. (Carlisle).—1. No. 2. No.

Bolton.—1. No. 2. No.

"*An Old Subscriber.*"—Chemist and Druggist; Member, 1870.

In consequence of want of space, we are obliged to postpone the insertion of answers to several correspondents.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Fairlie (Glasgow), Mr. H. B. Brady (Newcastle), Dr. de Vrij, Mr. A. Carter, Mr. R. Mountain (Harrogate), Mr. H. A. Thompson, Mr. M. C. Cooke, Mr. G. Dymond (Birmingham), Mr. O. Davies Owen, W. B. (Dudley), G. S., A. H. E., A. P. S., "Biondino" (Scarborough), "Pestle and Mortar" (Dorking), "Anxietas" (Macclesfield), Jestyn ap Gwrgan.

CHLORAL.

Hydrate—Alcoholate—Tests—Therapeutical Value—Pharmaceutical Preparations.*

BY ALFRED H. MASON.

The principal object of this paper is to show that the hydrate of chloral of commerce is not all pure hydrate of chloral, but that other compounds have been put upon the market. I have examined samples, obtained from different sources, varying very seriously in the proportion of chloroform they produce upon decomposition with alkaline reagents, and I feel it a moral duty to pharmaceutists to advise them of these facts. When it is considered that one agent alone in London has disposed of twenty-two thousand pounds' weight † during the past twelve months, it is certainly high time for us to be alive to the necessity of dispensing a guaranteed article.

Chloral, C_2Cl_3HO, is formed by the prolonged action of chlorine upon absolute alcohol.‡ To prepare it, the current of chlorine must be kept up as long as hydrochloric acid gas continues to escape, and the product is to be agitated with three times its volume of concentrated sulphuric acid. On gently warming this mixture in a water-bath, the impure chloral separates as an oily liquid, which floats on the surface of the acid; it is purified by distillation from fresh sulphuric acid, and afterwards from a small quantity of quicklime, which must be kept completely covered by the liquid until the end of the operation. The chemical reactions which take place in its formation were described in a valuable paper by Mr. Henry Sugden Evans, of London, last session.

Chloral is a thin, oily, colourless liquid, of peculiar and penetrating odour, which excites tears, and it has but little taste.

Liebreich says,§ if chloral be left in contact with concentrated sulphuric acid, it is transformed into polymeric insoluble chloral; this body is more easily purified, since it is not soluble in alkalies or acids, and it may be treated a long time with these substances without decomposing. Warm this insoluble chloral, and it converts itself into soluble chloral. The sp. gr. of soluble chloral is 1·502. By degrees it thickens, and is sometimes transformed suddenly into soluble chloral evolving a large amount of heat.

When we mix anhydrous chloral with water, we obtain in a short time acicular crystals of hydrate of chloral, this body being distinguished from ordinary chloral by containing one molecule of water. Its formula is $C_2Cl_3HO + H_2O$.

This method is the one alone authorized by Dr. Liebreich, of Berlin,‖ who took out a patent in July, 1869, for the sole use for anæsthetic purposes of chloral, hydrate of chloral, and trichloroacetic acid, $(C_2HCl_3O_2)$.

The physiological and therapeutical experiments made by Liebreich led to the introduction of this product as a medicinal agent, and since he has published his formula,* with the results of his experiments, I think we should fix upon his method as the OFFICINAL one. The superiority of the hydrate of chloral manufactured under his supervision I shall prove to you (i. e., *if the larger proportion of chloroform produced by alkaline reagents from the chloral compound employed* is to be the test, which is, I think, self-evident). He tells us that numerous experiments show that this method is far the most trustworthy.

Chloral is obtained in other ways; for instance, by the method of Stædeler, from starch, by distillation with hydrochloric acid and dioxide of manganese, formic acid, carbonic acid and other bodies accompanying it; but Liebreich states he has made experiments with this preparation and finds it is not to be depended upon in its action, from the great difficulty of preventing the formation of other compounds, especially chlorides of carbon, which serve to contaminate the chloral and render its administration dangerous.

It was contended by M. J. Personne† that the hydrate of chloral described by M. Roussin as pure, was nothing more than a compound of chloral and alcohol. Differences being observed in the physical properties of the preparation made by Liebreich and that made by Roussin, it was found that they were two entirely distinct compounds, which was fully confirmed by an appeal to analysis. Theoretically, hydrate of chloral should contain 64·35 per cent. of chlorine. M. Personne found that the preparation he had made contained 63·79 per cent., whilst a sample of that made by M. Roussin yielded only 54·89 per cent. Following this indication, Personne endeavoured to ascertain by experiments whether the hydrate of chloral prepared by Roussin did, or did not, contain alcohol. The results were very satisfactory in proving the presence of this compound. Further, by combining anhydrous chloral and absolute alcohol in proper proportions, Personne was enabled to prepare synthetically a substance having properties entirely similar to those of the supposed hydrate of chloral prepared by Roussin.

It is this preparation, alcoholate of chloral, represented by $C_2Cl_3HO + C_2H_6O$, that we meet with in commerce, also hydrated alcoholate of chloral, which are not to be trusted as therapeutic agents according to the system laid down by Liebreich.

At a meeting of the Pharmaceutical Society, Mr. John Williams suggested that an alkaline reagent would show the percentage of chloroform the chloral preparation would produce. Mr. Charles Umney has also made some very valuable experiments, and instituted what is now known to pharmacists as "the ammonia process" for testing hydrate of chloral. The mode of operating, and the results of his experiments, are published in the PHARMACEUTICAL JOURNAL.

I find that hydrate of chloral is insoluble in *cold* chloroform, tetrachloride of carbon, turpentine and bisulphide of carbon, but on the application of heat, solution is effected. The hydrate is, however, perfectly soluble in cold water, ether (·735) and absolute alcohol (·805); after the application of heat, and upon cooling, the hydrate separates in beautiful crystals, generally needles, but from bisulphide of

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* Read at a meeting of the Liverpool Chemists' Association, held December 22nd, 1870.

† This includes both kinds of hydrate of chloral, as distinguished *now* by the agents themselves,—guaranteed and unguaranteed.

‡ Fownes' 'Manual of Chemistry,' p. 813. 1868.

§ 'L'Hydrate de Chloral,' O. Liebreich, 1870, p. 15.

‖ *Idem.*

* 'L'Hydrate de Chloral.' Oscar Liebreich.

† *Journal de Pharmacie et de Chimie.*

carbon in prisms. True hydrate of chloral is not acted upon by nitrate of silver or by acids.

Alcoholate of chloral is perfectly *soluble* in chloroform, ether, tetrachloride of carbon, absolute alcohol, turpentine, and bisulphide of carbon, and upon heating does not present any change, nor can I produce crystals from these alcoholic solutions. Why, I do not quite understand. In cold water alcoholate of chloral is nearly insoluble; and I venture to suggest this as a *simple* test for these two forms of chloral compound.

If twenty grains of the chloral compound is *soluble* in thirty minims of cold chloroform, it is not a hydrate; on the other hand, if the same quantity of chloral compound is *insoluble* in chloroform, I should consider it a hydrate,—solubility in cold chloroform and partial insolubility in cold water being quite sufficient test to lead *to doubt;* and so in proportion to the solubility, should I judge the probable quantity of chloroform which the ammonia process would yield.

Now if the theory of Liebreich, that the hydrate of chloral coming in contact with the alkalies in the blood evolves chloroform in the human system, be correct, a moment's glance will soon convince you of the immense superiority of samples No. 1, 2 and 3, and the decided obligation that pharmacists should dispense this manufacture only until it can be shown that hydrate of chloral of equal composition may be procured elsewhere.

Therapeutical Value.—If we review the pages of the medical journals for the therapeutical effects of hydrate of chloral, we shall find many cases where its action has been attended with marvellous results. There does seem not a little danger of its being erected into a kind of panacea for all the ills that flesh is heir to, of its true worth and fame suffering from too indiscriminate use, and from the administration of some of the impure compounds which are being supplied. Its value, however, is too real for actual collapse by its abuse; but its repute may be, and doubtless has been, dangerously compromised.

We find it employed in cases of "maniacal paroxysms," "delirium tremens," "traumatic tetanus," chorea, diarrhœa, whooping cough, convulsions (epileptic or otherwise), with more or less benefit; it allays vomiting, and prevents sea-sickness; in puerperal mania it is well reported of; in fact, as a sleep compeller it is, in a very large number of cases, unrivalled; for while in power opium alone can be compared with it, there is this superiority to opium, that its use entails no unpleasant after symptoms, no headache, no nausea, no anorexia, no constipation, whilst

Sample No.	Manufacturers, or by whom supplied.		Boiling Point.	Chloroform Layer.	Percentage of Chloroform produced from 500 grains of the chloral compound.	General Remarks.
			Centigr.	Grains.		
1	Hydrate of Chloral, prepared under the supervision of Dr. Liebreich, by Dr. Martius and Dr. P. Mendelssohn Bartholdy, of Berlin.	Cake.	97°	240	357·6 grains, or 71 p.c. (71·5)	A crystalline cake, white, easily powdered, with an agreeable melon odour, slightly pungent. Soluble in water, ether, alcohol; insoluble in chloroform, carbon tetrachlor.; partially soluble in turpentine, and bisulph. carbon without heat. With heat, dissolves and, on cooling, needle crystals are formed, except in the case of bisulph. carb., which seems, as it were, to gelatinize it.
2		Powder.	96·5°	240	357·6 grains, or 71 p.c. (71·5)	A white powder. Results same as above.
3		Crystal.	98°	235	351·7 grains, or 70 p.c. (70·3)	Bright rhomboid crystals, melon smell, more pungent. Results as above.
4	Manufactured by Messrs. De Hane and Co., Hanover.—Cake.		100·5°	190	283·1 grains, or 57 p.c. (56·6)	Semi-transparent crystalline cake, rather hard, slightly deliquescent, much more pungent smell, caustic. Soluble in water, ether (with slight effervescence), alcohol; insoluble in chloroform, carbon tetrachlor., bisulph. carbon, and turpentine (slightly), without heat; with heat, soluble in all, and upon cooling crystallizes.
5	From Messrs. T. Morson and Son, London.—Crystal.		100°	190	283·1 grains, or 57 p.c. (56·6)	Thin, deliquescent, colourless, crystalline plates (in appearance resembling potass. chlor.), slightly pungent, melon smell. Soluble in water (with argent. nit. shows slight opalescence), ether, alcohol; insoluble in chloroform, carb. tetrachlor., turpentine, bisulph. carb., etc.
6	Manufactured by Messrs. Dunn, Squire and Co., London.—Cake.		100°	190	283·1 grains, or 57 p.c. (56·6)	Hard, thick flakes, very white, pungent melon smell. Soluble in water, ether (but soon turbid), carbon tetrachlor. (on heating separated), alcohol (heat no change); insoluble in chloroform, turpentine (with heat deposit at the bottom of the tube), bisulph. carb.; separates, and heat will not combine.
7	Supplied by Messrs. Schoetensack and Co., London.—Cake.		100·5°	190	283·1 grains, or 57 p.c. (56·6)	Hard white crystal cakes, very pungent. Soluble in water, alcohol, ether (with slight effervescence), partly soluble in turpentine, bisulph. carb.; insoluble in chloroform. On the application of heat, when cooled the ether solution shows fine needle crystals, the bisulph. carb. solution solidifies.
8	Manufactured by Messrs. De Hane and Co.—Crystal.		105°	185	275·6 grains, or 56 p.c. (55·6)	A white crystalline powder, slightly deliquescent. Soluble in water, ether, alcohol; insoluble in chloroform, carbon tetrachlor., turpentine, bisulph. carbon.
9	Manufactured by Messrs. Gehe and Co., Dresden.—Crystal.		110°	180	268·2 grains, or 54 p.c. (53·6)	Transparent needle crystals, caustic, rather deliquescent, slight smell. Very soluble in chloroform, ether, carbon tetrachlor. (crystals formed again without heat), alcohol, turpentine and bisulph. carbon (crystallizes at bottom), partly soluble in water.

the sleep it produces is gentle, calm and continued; at least, this is the general rule, but, of course there are exceptions, and medical men complain that its administration is attended with uncertain results, and that its quality is not so good as it was when first introduced, and can anything justify these assertions more than the foregoing results; but even with true hydrate of chloral we must expect to find exceptional cases so long as human beings differ so greatly in temperament, constitution, and sensibility to the action of medicine.

That hydrate of chloral ought to be perfectly pure when used in medicine is unquestionable; the substitution of alcoholate is quite sufficient to produce most of the ill effects attributed to chloral. In fact, instead of being a hypnotic, it has a tendency to produce mental excitement, as ordinary stimulants.

The dose of hydrate of chloral is from 5 grains to 30 or 40 grains, according to the purpose for which it is required. A case is on record where 100 grains were taken accidentally without any evil results; but I am informed that there is danger in continued small doses. Very unexpected results have, in a few instances, occurred. And here I would strongly caution pharmaceutists not to prescribe its use themselves, or supply it to the public without the sanction of a medical man.

Hydrate of chloral has been successfully administered as an antidote to strychnia.

Hydrate of chloral cannot, in consequence of its chemical properties, be administered in the shape of pills or in the form of powder; it is, therefore, necessary almost to confine its use to solutions. For dispensing purposes, Liebreich recommends a solution of the hydrate in its own weight of water. In small doses it can be given without the addition of a corrective, but simply dissolved in distilled water.

There are several pharmaceutical preparations in which the hydrate of chloral is disguised, or its taste modified, in various ways. Of the syrups containing 10 grains of Liebreich's hydrate in each dram, one made with syrup. pruni virg. is used in America; it is most palatable. Another is made with syr. tolu; others with syr. flor. aurant., syrup. cort. aurant. (as suggested by Liebreich). Another is flavoured with almonds (Ferris). There is also a draught containing half dram chloral, with syrup tolu, tinct. ginger and peppermint water. Lozenges containing 1 grain hydrate of chloral in each are manufactured by Messrs. Meggeson and Co.

Spiritus chloralis is made by Savory and Moore. It has a very agreeable taste and smell, but I was not able to obtain any deposit upon evaporating a little.

Limousin's capsules are known to contain alcoholate of chloral, because true hydrate cannot be secured in a gelatinous envelope.

In prescribing and dispensing hydrate of chloral, it should be borne in mind that no corrective with alkaline reaction can be employed with it, because such an administration would bring about the transformation of the substance.

In concluding this paper, I must add that I have no interest whatever in putting forward the claims of Liebreich's manufacture, further than a feeling of moral duty to the medical profession, pharmacists and the public, together with the *conviction* that other manufactures which have come under my notice do not attain the desired standard. It appears that the importers of this article now know a guaranteed hydrate of chloral and an unguaranteed hydrate of chloral. There is a guarantee to the consumer, which is the protection of the hydrate manufactured under Leibreich's supervision; this is a registered trade mark. It is offered in three forms—cake, crystal and powder; but the action of the cake is more to be relied upon. Each product should be kept in well-stoppered bottles. The large quantity which the bottles with the registered trade mark contain is, I think, a drawback to its more universal application; and I think, if the agents of this manufacture could be induced to supply it in smaller bottles,—say from 1 oz. upwards,—with the registered label on each bottle, and could produce it at a cost more in proportion with the competition, they would not only further the objects of the discoverer by more satisfactory and uniform results being produced, but also benefit mankind in general.

NOTE ON AUSTRALIAN OPIUM.*

BY J. S. WARD.

The large sum paid as duty on all opium imported into Australia has caused the experiment of growing poppies for the production of opium to be tried for two or three years in different parts of the colony of Victoria with good success. The product has been of a tolerably uniform quality, and the samples have yielded variable quantities of morphia.

The sample of which I shall treat was sent by Mr. Francis, a Melbourne pharmaceutist, formerly with Messrs. J. Bell and Co., 338, Oxford Street, to Mr. T. H. Hills. I have been requested by the latter gentleman to examine it and lay the result before this meeting.

But before going into particulars as to its quality, I shall read an extract from Mr. Francis' letter referring to the cultivation of the poppies and the collection of this opium:—

"The poppies, from which the present sample was extracted, were grown in Gipps Land, a vast tract of country forming the south-east portion of the colony of Victoria. The land taken up was one quarter acre. The plants were placed nine inches apart, in rows two feet six inches from each other. They were planted in July, the opium was extracted in the December following. Each plant attained a height of from five to six feet, the number of capsules on each averaging ten. The mode of gathering was as follows:—The capsules were nicked in the afternoon of the day by one person, another following immediately after, gathering the drops as they fell. The liquor, being very thick, was then placed in tin dishes and exposed to the sun till a proper consistence was attained. The gross yield of opium from the quarter acre of the consistence of the sample sent was 14 lbs. weight. You will notice that the mode of collecting is somewhat different to that spoken of by Pereira, and it was found better to collect towards evening than in the morning, on account of the heavy morning dews.

"I have seen other samples of opium prepared and grown in the colony, but got up more closely to resemble the ordinary article of commerce; they compared very unfavourably with the one sent.

"I might, perhaps, mention that I paid 52*s.* per lb. for the opium; but I bought it rather on account of its novelty than for any other reason. I have not

* Read at the Evening Meeting of the Pharmaceutical Society, Jan. 4, 1871.

yet used it in business, nor tested it, so as to arrive at my conclusions as to its commercial value.

"All imported opium is subject to a duty of 10*s.* per lb."

This opium, when first received, was of a light brown colour, and in appearance like a well-made hard extract; but on keeping became like other opiums, much harder and darker; when quite dry, it breaks with a smooth regular fracture. These characters are explained by its being a pure dried juice.

Its odour, which is very fine and marked, is similar to that of Smyrna opium, but scarcely so powerful. Cold water takes up 46 per cent. of soluble matter. A tincture made according to the Pharmacopœia is of a very light colour, being no darker than the tincture of myrrh.

The most important character of this sample is its richness in morphia. On submitting it to quantitative analysis I obtained the following result:—

Morphia	9 per cent.
Narcotine	4 " "
Meconic Acid	6 " "

I have not examined it for any other alkaloids, not having a sufficient quantity of the sample to work on. I can only find one report of an analysis of this opium, namely, by Mr. Bosisto, of Richmond, who, in a paper read before the Royal Society at Melbourne, stated that it contained 10 per cent, of morphia and 3 of narcotine.

By these characters, it will be seen that Gipps Land opium will compare favourably with the best Smyrna; and it cannot, I think, be doubted that its more extensive cultivation in this district would prove a source of large increase to the revenue of the colony, and, consequently, of great advantage to its inhabitants, while, at the same time, it will supply us with another new and important source of this valuable drug.

THE NAMES OF THE CINCHONA ALKALOIDS.

BY DR. J. E. DE VRIJ.

In No. 18, of October 29th, 1870, of this Journal, I found, on page 342, an article upon Java cinchona bark, abstracted from Herr Jobst's paper in *Neues Jahrbuch für Pharmacie*, xxxiv. 18, which induces me to make a few remarks.

If anybody not thoroughly acquainted with the chemistry of the cinchona alkaloids, in reading this paper, compares the results obtained by Professor Gunning and by Herr Jobst, he will very probably suppose that there exists much discrepancy between the results of these two chemists; as the one found (for instance) in Java Calisaya bark much quinidine, whilst the other found therein no quinidine, but conchinine, etc. The cause of this apparent discrepancy is that Professor Gunning, like the majority of chemists, calls the alkaloid discovered by Henry and Delondre, and later admirably well described by Pasteur, *quinidine;* whilst Herr Jobst uses for this alkaloid the name of *conchinine,* which name was given to it about two years ago by O. Hesse. If this chemist had discovered the alkaloid in question, I should have no objection to the name; but as the name quinidine has, since it has been confirmed by the investigations of Pasteur, been accepted by the majority of chemists, and particularly by Mr. Howard in his celebrated 'Quinology,' I consider it in the interest of this branch of science not to alter the name which it has now borne more than thirty years. In the same paper Herr Jobst uses the name of quinidine for what the majority of chemists, and also Mr. Howard in his 'Quinology,' call cinchonidine. I hope that the Editor of this Journal will agree with me on this topic, and for the convenience of the readers always use the names of quinidine and cinchonidine, as they have been used since 1848 by Pasteur and the majority of chemists.

The Hague, December 10th, 1870.

GLYCERINE EXTRACTS OF PEPSINE AND OTHER FERMENTS.*

Mr. M. Foster reports, in *Nature*, the result of a repetition of some experiments, published a short time ago by Von Wittich in *Pflüger's Archiv*, upon the isolation of pepsine and other so-called ferments by means of concentrated glycerine.

After washing the mucous membrane of a pig's stomach, it was freed as much as possible from water, minced, bruised, and covered with pure glycerine. Having stood twenty-four hours, a few drops of the glycerine, diluted with acidulated water, digested fibrin rapidly. This process was repeated four times, each resulting extract manifesting strong peptic powers. Treated, after filtration, with an excess of alcohol, these extracts gave a slight precipitate, which, separated by filtration and redissolved in acidulated water, was strongly peptic.

Salivary gland and pancreas yielded to glycerine a starch-converting ferment, and a "laden" pancreas gave a ferment digesting fibrin in an alkaline medium. Ungerminated barley gave up a non-proteid diastase; almonds a ferment acting on amygdalin.

The author thinks that glycerine offers advantages in the investigation of this subject not presented by any other medium, as the extracts remain unchanged for a long time, while the tissues, being little altered after exhaustion of their ferment by repeated treatment with glycerine, may be examined under conditions hitherto impossible. He claims that these results are also of practical value in the preparation of the so-called pepsin for medical purposes; as by glycerine a pure palatable peptic liquid, apparently keeping any length of time and certain in its action, can easily be obtained.

IODOFORM.

BY J. HENRY CARSTENS, M.D.

Teriodide of formyl, or sesqui-iodide of carbon as it was formerly called, has a chemical composition of CHI_3. It was discovered in the year 1822 by Sérullas, who procured it by adding chlorinated lime to an alcoholic solution of iodide of potassium. Claimed by Dumas to be analogous to formic acid, the iodine taking the place of the oxygen (also chloroform and the like preparations).

A good method for making this compound is given by Wittstein. Two parts of carbonate of potash, two parts of iodine, one part of alcohol, and five of water, are mixed in a retort, which is then heated by means of a water-bath till the contents are perfectly colourless. After the retort has cooled, the liquid is poured into a beaker and allowed to settle. The yellow scaly mass is then collected on a filter, washed thoroughly with water,

* See *ante*, p. 403.

and dried between filter-paper. Reaction (according to new nomenclature) :—$6(K_2CO_3) + 16I + 2(C_2H_5HO)$. Five atoms of oxygen of the carbonate of potash join $2(C_2H_5HO)$, forming $2(HCHO_2) + 3(H_2O) + 2(CH)$; $2(HCHO_2)$ combines with $K_2O = 2(KCHO_2, H_2O)$; $10K + 10I = 10$ (KI); while 6I and the $2(CH)$ of the alcohol form $(2CHI_3)$, carbonic acid escaping.

According to this, the gain of iodoform would be 38 per cent.; but the reaction never takes place so completely, and we must remember that all these changes take place at once, and that iodoform is very volatile (must never be made in an open vessel); the alcohol evaporates, and must be used in larger quantities; the excess of carb. of potash does not retard, but seems to increase the reaction.

By using six ounces of iodine only one ounce of iodoform is collected, or about 17 per cent. It would therefore be very expensive if we could not make use of the filtrate for making iodide of potassium. This liquid contains, besides traces of iodoform, the balance of the iodine as iodate of potash and iodide of potassium, and also formate and carbonate of potash.

Evaporate this solution to dryness and triturate with one-eighth of its weight of charcoal, and then heat to redness for a short time in an iron crucible, then digest in alcohol and filter; the residue is carbonate of potash, while the filtered solution contains the iodide of potassium; the alcoholic solution is evaporated and allowed to crystallize. By this means no iodine is lost, and teriodide of formyl ought to be not more expensive than iodine.

Iodoform appears in the shape of yellow, shining, six-sided scales, with a spicy odour (like saffron or iodine and chloroform); is volatile at ordinary temperature. Almost insoluble in water (one part in 13,000), but more soluble in alcohol (one part in 80). If it be used in a mixture, it is necessary to avoid alcoholic solution of potash, which decomposes it, forming formate of potash and iodide of potassium :—

$$CHI_3 + 2(K_2O) = KCHO_2 + 3KI.$$

Besides the well-known effects of iodine and its preparation, iodoform has the advantage of the former preparation of being stronger and more uniform in its action on the system; that is, does not corrode, nor act as a local irritant, and that, therefore, it may be given uninterruptedly. It is anodyne, and, consequently, often useful in neuralgia; producing also a local and partial anæsthesia of the colon. It has less anæsthetic powers than chloroform, although recommended by Eugenio Franchino (*Gaz. Sard.* 28, 1858) as a general anæsthetic in place of chloroform. First used by English physicians in form of ointment for exanthema; used by Litchfield in porrigo and lepra; by Glover for psoriasis, impetigo, scabies, etc.; also recommended for croup (internally), and used with good success (*Monthly Journal, Feb.*, 1848). On the recommendation of Moretin and Mouzard (*l'Union*, 1857), used as a local anæsthetic, in the form of suppositories, in the prostate; it also seems to relieve tenesmus, easing defecation.

Iodoform has lately been prominently brought to the notice of physicians in the United States as a remedy for chronic ulcers (Proc. Penn. State Med. Soc. 1868), obstinate neuralgia, scrofula, strumous ophthalmia, consumption, and even in cancer is stated to have relieved the excruciating pain of this malignant disease, without seeming to arrest the same (*Medical and Surgical Reporter*, Phil., vol. xvi. xvii. xviii.). It is also a valuable dressing in chancre.

It is best administered in pill form, one to two grains, three times a day. Quevenne's iron may often be advantageously added. Externally it is used as an ointment, one-half to one drachm of iodoform to one ounce of lard, or it is dissolved in hot alcohol and glycerine added; these to be used *pro re natâ.—Detroit Rev. of Medicine.*

APOMORPHIA.*

Apomorphia, a very curious organic base, was discovered by the late Dr. Matthiessen and Mr. C. M. A. Wright, while experimenting in the laboratory of St. Bartholomew's Hospital, in April, and reported on to the Clinical Society by Dr. Gee, in May, 1869.† It is obtained by submitting the chloride of morphia for several hours to the action of strong hydrochloric acid at a high temperature. The result is the chloride of apomorphia, from which the base may be obtained without difficulty; but as it is very unstable, the salt has been used. Chemically the base, apomorphia, differs from morphia by containing the elements of a molecule of water less. Its chloride is a white crystalline powder, soluble in thirty parts of cold, and in much less of warm water. As a medicine it possesses most remarkable emetic powers, acting rapidly and certainly. Dr. Gee says, "We have never yet failed to produce vomiting when we wished to do so, and by a single dose." The salt is free from all local irritant properties, and can therefore be used hypodermically; its dose is very small—one-fifth of a grain by the mouth, or one-tenth of a grain hypodermically, acting rapidly and freely; and its action is not accompanied or followed by any ill effects. "The vomiting," Dr. Gee says, "seems, in most cases, to be critical, as it were, and put an end to itself; there is no subsequent nausea."

The only other information on the use of this salt is a short communication from Dr. F. M. Pierce, who confirms Dr. Gee's statements. He says, "It is the most speedy and most certain emetic known—the tenth of a grain of the chloride, or even less, is the dose required. It may be given safely to children, and acts more rapidly when hypodermically administered" than when given by the mouth.

Should it turn out that the drug has no other medicinal value than as an emetic, it will be a most important addition to the materia medica. No other emetic can be administered hypodermically; and all others are bulky in dose, very uncertain in action, and produce distressing nausea and depression.

THE KATIPO, OR POISON SPIDER OF NEW ZEALAND.

BY DR. WRIGHT.

The author, in a paper communicated by him to the *Medical Times and Gazette*, reports the case of a man who, while employed in carrying firewood which had been stacked in some sedge or coarse grass, was bitten by a katipo on the shoulder. Within an hour, upon attempting to eat his dinner, he found that he could not open his mouth, and was scarcely able to articulate in consequence of stiffness about the jaws. He immediately applied to Dr. Wright for medical assistance, but was scarcely able to make himself understood. Upon examination of the spot the surface was found to be raised to an extent as large round as a teacup. This swelling was white, and surrounded by a halo of red not unlike an exaggerated wheal of the nettle-rash. He complained of considerable pain in the part. During the examination he became faint and almost pulseless, his countenance and body assumed a hue of extreme pallor, his extremities were cold and flaccid, his respiration almost ceased, and there were fears that he was about to expire. Ammonia was applied to the wound, and ammonia and water combined with brandy, in considerable doses, administered; but it was upwards of two hours before the man was sufficiently recovered to return home. Several days elapsed before he was able to resume work, in consequence of great lassitude and nervous depression.

* Abstracted from a series of papers on the "Progress of Therapeutics," published in the *Medical Times and Gazette*.

† *Transactions of the Clinical Society*, vol. ii. 1869, p. 166.

The information concerning this insect which the author has been able to obtain is to the following effect:—The katipo is a small spider, from half to three-quarters of an inch in diameter, measured across the body and legs. There are said to be two kinds, one with a dark glossy brown or black spherical body and compact legs, found amongst dead wood in gardens, or with a slight web among the rafters of lofts and outbuildings; the other, which is the most poisonous, has a black body with a vermilion spot upon its back, and inhabits the sandy beaches of the seacoast, taking refuge among the driftwood and roots of sedge or rushes found there. The author considers the poison to be of a narcotico-irritant nature, similar in its effects to those recorded as following the bite of the tarantula.

In corroboration of the nature of the accident, an account of three cases of katipo bites met with by the Rev. Mr. Chapman, a missionary to the Maori race in the interior of New Zealand, is appended. In one case a native girl was bitten near the beach, and, although ammonia was applied, and wine and other nourishment given, died after lingering two months. In the second, a boy was bitten in the thigh, and did not recover for nearly six months. In the third case the sufferer was a native chief, with whom the missionary was travelling. We give the account of it in his own words:—"We were travelling together up the coast from Whatakane, and, halting to dine, he seated himself upon a large tuft of sedge. He had not been sitting many minutes before he sprang upon his feet, saying he had been badly bitten by a katipo on the upper part of the thigh. I directed him to lie down; I then dissolved some carbonate of soda in a very small quantity of water, and, adding to this some brandy from my flask, quickly made a crucial incision over the part bitten, squeezed out forcibly the blood, and rubbed in this antacid solution, keeping up this action for ten minutes, when he said he no longer felt the pain. He remarked on rising, 'Had you not been with me, I should have had a long illness.' Only two or three minutes could have elapsed after the bite before a spot about the size of the top of the little finger appeared, of a peculiar white colour, in strong contrast with the dusky shade of Toke's skin. He was very careful to secure all the blood I had forced out of the wound I had made by absorbing it in a piece of rag torn from his shirt. This relic, now so doubly sacred, he carried into the middle of a swamp close by, and I saw him stamping it down into the ground very violently, to preserve it from possible desecration."

SWEET TINCTURE OF RHUBARB.

Take of Rhubarb, bruised,
Liquorice Root, bruised, of each 2 ounces.
Aniseed, bruised,
Sugar, of each 1 ounce.
Diluted Alcohol, 2 pints.

Macerate for fourteen days, express and filter.—*New York Druggists' Circular.*

BOTANY IN MEDICAL SCHOOLS.

In an introductory lecture, delivered by Mr. Leo Grindon at the opening of the current session of the Manchester School of Medicine, the lecturer, alluding to the utility of a knowledge of materia medica, remarked that it would especially ill become him to undervalue the right use of drugs, since the germ of the science of botany was found in the study of the vegetable portion of the materia medica by the pupils of Aristotle; and although an eminent physiologist and lecturer had quite recently expressed his opinion that both chemistry and botany should be omitted from the curriculum of study in medical schools, he could not but exclaim, God forbid that the day should ever come when it should be said that medicine was unfaithful to its first love, and that the allegiance of more than 2000 years had come to an end. It might be that Professor Huxley objected rather to the particular portion of botany to which the student was too often required to give his first attention,—an attention quite as frequently repelled by it as allured. The student who was wishful to learn how to distinguish *Dulcamara* from *Belladonna*, and to possess clear notions of the general aspect of deleterious plants as contrasted with harmless ones, could not be expected to feel either gratification or encouragement in minute details respecting *Phyllotaxy* and *Bothrenchyma.* To the student, botany so initiated may well seem a useless burden, and he (the lecturer) could not see how the student was helped towards the practical knowledge of pharmaceutical and poisonous plants by being saturated with minute vegetable anatomy. Vegetable histology was one of the noblest pastimes of every true botanist, and a large acquaintance with it was one of the special ornaments of his profession, but to commence with it was to enter the temple through the roof instead of the portico. He did not believe that Professor Huxley or any one else could deem it superfluous that the medical student, in addition to receiving a good groundwork of structural botany, with its complement of physiology, should be shown, as in their Manchester school, specimens, or other intelligible illustrations of every plant mentioned in the Pharmacopœia, and of every plant the name of which cropped up periodically in connection with deaths by accidental poisoning. That the practical department of botany involved in its teaching far more labour and anxiety of preparation than was needed for illustrations of histology might account for the preference given to the latter; and if teachers were not able or willing to undertake that labour, it certainly was a reasonable question,—had not botany better be out of the curriculum?—*Gardeners' Chronicle.*

Tinted Honey.—A specimen of rose-coloured honey has been presented by Messrs. Fortnum and Mason to the Food Department of the South Kensington Museum. It is of great beauty and delicacy. The comb is virgin, the wax almost white, the honey limpid, pure and of the colour of pale red currant jelly. The secret of its production is not revealed, except that it is the result of artificial feeding. The *Gardeners' Chronicle*, after alluding to the various opinions held as to the change which honey undergoes between the time of its being taken from the nectary and that of its being deposited in the comb, remarks that honey from white clover has a greenish-white hue, that from heather a rich golden yellow, and no doubt other colours might be observed according as certain flowers are in particular abundance. It is even possible that feeding the bees upon currant or raspberry jelly or jam would answer the purpose equally well. But it is clear that this step in the refinement of honey being reached, we shall not stop here. With the help of the chemist, the beekeeper will be able to turn out, in a few weeks, to order, honey of any hue, blue, pea-green, orange, or apricot-coloured, or even,—by a little ingenious manipulation of the present system of hives, which will allow of any part of the comb being shut off or made accessible to the bees at pleasure,—a parti-coloured honey, arranged in artistic patterns and devices.

Wax-Varnish.—Benzine will dissolve a large proportion of wax, especially when heated to the boiling-point, which can be easily effected without danger of explosion, by placing a bottle containing the liquid in water heated to between 150° to 200° F. The solution, however, will deposit a cloudy sediment upon cooling. Nevertheless, it can be readily used for producing wax paper, or, in fact, for all manipulations where the object is to produce a thin uniform coating of wax on any foreign substance. The benzine evaporates completely within a few hours without leaving a trace of smell behind. The best solvent, however, I found to be bisulphide of carbon. This substance readily produces a concentrated clear solution of wax, even without the aid of heat, and evaporates so quickly, that wax paper produced by its aid is ready for use within a few minutes after being impregnated. The latter manipulation should be performed quickly and on both sides by means of a soft sponge. This solution will be found especially adapted for coating gypsum statuettes and other similar work. It may also be used for closing up small cracks in furniture prior to being varnished or painted, as also for bedsteads to exclude bed-bugs. For the former purpose it may be coloured to harmonize with the furniture. The use of this "Wax-Varnish" will be found very convenient, especially during the summer months, when gas stoves and charcoal furnaces are in general use, which will not produce the uniform heat over a large surface that is necessary to make good wax paper according to the usual plan.—*Hermann Koch, in Druggists' Circular.*

Test for Chloric Acid, by M. R. Bœttger.—Three years ago M. Braun described an extremely delicate test for nitrates and nitric acid; it depended upon the intense red coloration produced by these bodies upon sulphate of aniline dissolved in sulphuric acid. M. Bœttger suggests the same reaction for the detection of chloric acid and the chlorates. The smallest possible trace of a chlorate introduced into the solution of sulphate of aniline in sulphuric acid will develope almost instantaneously a blue colour throughout the mass.—*Journ. de Pharmacie et de Chimie.*

Flavour for Chloral Hydrate.—A correspondent of the *New York Druggists' Circular* says that the taste of chloral hydrate may be successfully disguised by the addition to a solution of the chloral of a little simple syrup and a few drops of oil of sassafras.

Tin-lined Water Pipes.—In an article upon the subject of the poisoning of water by pipes used for domestic purposes, the *Boston Journal of Chemistry* warns its readers against the tin-lined pipes lately introduced, which it asserts are dangerous because (1) tin by itself is often more readily attacked and dissolved by water than is lead; (2) where there is water contact between lead and tin, both metals are dissolved with increased rapidity. It adds that galvanized pipe is just as dangerous, for in this case salts of zinc are formed and gradually dissolved.—*Food Journal.*

Poisoning by a Disinfectant.—A fatal mistake occurred on Monday, December 26, at Winchmore Hill. Mrs. Gardiner, of Edmonton, having called to see her sister, Mrs. Eaton, whose family had been suffering from small-pox, was invited to partake of a glass of rum. After drinking a small quantity she complained of the taste, saying that it was very hot. Her sister then tried a little diluted with water. Shortly afterwards both ladies were taken seriously ill, when it was found that instead of rum, they had been drinking a disinfecting fluid kept in the house by order of the doctor. Mrs. Gardiner lived only a few hours, and her sister lies in a very dangerous state.—*Standard.*

Poisoning by Tincture of Squills.—A case of poisoning has occurred at Penzance, the particulars of which are as follows:—The wife of a miner being ill a messenger was sent to Mr. Chenhalls' surgery for some medicine. While preparing it, Mr. Chenhalls found he had not sufficient tincture of squills. He therefore asked the messenger, who is rather deaf, to take a bottle to a chemist's and have it filled for him. Instead, however, of returning with the filled bottle to Mr. Chenhalls, the messenger gave it to the patient's little boy, requesting him to tell his mother to take the same quantity as before. The patient did so, drinking nearly an ounce of the tincture. Mr. Chenhalls, finding the messenger did not return, acted promptly when he discovered the mistake, but nothing could prevent death.—*Times.*

Botanizing in Honolulu.—A correspondent in Honolulu, after making a botanical tour in the Kaala range, writes, "Botanizing on this island is not without considerable danger. Only imagine descending a steep decline of 70°, which had to be done chiefly by swinging from the roots of one tree to the branches of the next one below, and that at the height of 2000 feet above the deep gorge beneath our feet." Nature, however, seems in all cases to provide a reward for her admirers who voluntarily expose themselves to such dangers for the purpose of bringing to the eye of science her numerous hidden beauties, for the writer continues to say, he was not a little surprised by the discovery of a violet with splendid snow-white waxy flowers, some of which were almost half an inch in diameter and exquisitely perfumed. He considers it probably a variety of *Viola Chamissoniana*, which he found in its ordinary state lower down in the forest; but the pure white flowers, stretching out their long peduncles above the surrounding low undergrowth and luxuriating in the full sunshine of an azure blue sky, far exceed in beauty those of *V. Chamissoniana*, which are of the ordinary violet colour.—*Nature.*

Poisoning by Mistake.—An inquest was held on Monday, January 2, in Bell Street, Edgeware Road, upon the body of a child two days old, to whom a dose of laudanum had been given by the nurse in mistake for castor oil. As soon as the error was discovered, medical assistance was obtained, but the child died twelve hours afterwards. A verdict of death from misadventure was returned.—*Standard.*

THE SALE OF POISONS IN CANADA.

At the Toronto Police Court, on Friday, November 25, twenty-five druggists were charged with having sold poison contrary to the law. *The Canadian Pharmaceutical Journal* has the following editorial remarks concerning this prosecution:—

"Many of our readers will, by this time, have learned of the recent prosecution of a number of our city druggists for alleged infraction of the law regarding the sale of poisons. The case is one of considerable interest to all classes of the community, and to druggists especially so. Nor is this interest of a purely local nature, inasmuch as the statute relates to all parts of the province, and should the decision, which is now pending, be rendered in favour of the prosecution, it is probable that druggists in other cities and towns would soon have to suffer a like humiliation with their Toronto brethren, by becoming a prey to the treachery of that most despicable of creatures,—a common informer.

"Some time during the middle of last month, the notorious informer, Mason, accompanied by one of his satellites, made a circuit of the drug stores of the city, and from twenty-five of these establishments succeeded in obtaining, by virtue of various artful misrepresentations, quantities of laudanum varying from forty minims to an ounce. Information was at once lodged with the police magistrate, and the offenders were, in due course, brought before that functionary. As the information was in all cases the same, it was proposed to try one as a test, which was accordingly done. From the evidence of the informer, it appears that the laudanum was procured with considerable difficulty, and it was not until the purchaser gave full particulars as to the purpose for which he wanted it, urging, as a reason, that his rest had for several nights been broken, that the druggist consented to let him have the quantity required,—a little over half an ounce. The question arose as to whether laudanum came within the meaning of the statute in being 'a deadly poison.' A number of witnesses, including Professor Croft and Dr. Lizars, were examined, but all agreed in their testimony that laudanum could not be so regarded, and could not, with propriety, be classed in the same category with arsenic, corrosive sublimate and strychnia. The case was remanded from day to day, but nothing contradictory to this was elicited. The magistrate declined giving judgment when the evidence was concluded, and although nearly three weeks have elapsed, the decision has not yet been rendered.

"It is not for us to say what the end of the case may be, but *from the evidence taken*, we certainly think that the point upon which the case appears to turn is clearly made out, and that laudanum cannot be considered a deadly poison, in the same light with poisons such as strychnia and arsenic. That the intent of the law is to include poisons such as these, and these only, will be apparent from a consideration of the following quotation from the Act in question:—

"'No apothecary, chemist, druggist, vendor of medicine or other person shall sell or deliver any arsenic, corrosive sublimate, strychnine, or other poison, mineral or vegetable, simple or composite, commonly known as a deadly poison (or which being incautiously or secretly administered may cause immediate death), to any person who does not then produce and deliver a certificate or note from some person duly licensed to practise as a physician or surgeon, or some priest or minister of religion, resident in the locality, addressed to such druggist, etc., and mentioning the name, calling, or profession of the person requiring such poison; and stating the purpose for which it is required, and that it ought to be sold to the persons requiring the same; and such certificate or note shall be kept by the persons selling or delivering such poison as his justification for so doing.'

"What is a deadly poison? This is a question somewhat difficult to answer. It is true we might give a general definition of the term, which might convey its commonly understood acceptance, but this definition might be widely incorrect. Happily, in this difficulty, the framers of the statute have plainly indicated what they, at least, understood by the term; that is—a poison 'which being incautiously or secretly administered may cause immediate death.' Certainly laudanum cannot come under this designation, for we know that 'immediate death' has never been known to result from its use, even in the most enormous quantities, and in all cases a sufficient time elapses for the exhibition of the proper remedies. Some persons have endeavoured to assign a wider and more general meaning to the term as used in the Act. Thus, an erudite correspondent of the *Globe* informs the readers of that paper that a deadly poison is one 'that will kill,' 'or produce death in man.' A moment's reflection shows this to be erroneous, but, assuming it to be correct, we might find hundreds of articles in a druggist's stock which might be classed under the term. The mere enumeration of these would be sufficient to show their character, but let us go to fields less promising and find what the grocer does in the 'deadly poison' line. Take one of the commoner articles—saltpetre—we find that in doses of one ounce it will prove fatal, and instances of such a termination have been recorded (Wood and Bache); cream of tartar, four or five teaspoonfuls have been found a fatal dose for an adult (Taylor's 'Medical Jurisprudence'); essence of ratafia, a teaspoonful is a fatal dose,—a case of poisoning by this quantity is reported in the *Lancet* in 1841; cayenne pepper, one ounce of which would cause death as certainly as a like quantity of laudanum. We might enumerate a number of similar instances, or might allude to alcoholic liquors which are, as a rule, comparatively slow in their action, but nevertheless remarkably sure; but think we have adduced sufficient to show that if a deadly poison is one which will produce death in man, and that such is the meaning of the term as used in the Act, the informer Mason need not in future confine his attention exclusively to druggists.

"We do not, at present, intend to pursue this subject further, but shall postpone our remarks until a legal decision has been given. In the meantime, we do not wish it to be understood that we treat the matter of the sale of poisons, with undue laxity; we hold to quite the contrary, and think that every legal obligation compatible with the lawful use of dangerous substances, should be laid down and enforced with the utmost rigour, but we believe that the present law is altogether insufficient for the purpose for which it was intended, as demonstrated by the fact that for over ten years it has remained a dead letter on our statute books, and when it is ultimately revived, it is only for the purpose of extorting money from one of the most respectable classes of the community, and placing it in the hands of one whose very avocation is a by-word and a disgrace.

"The most impracticable and pernicious feature of the present law is that of requiring a physician or minister's certificate as authority for the sale of poison (let the rendering of the word be what it may). On this subject one of the *Globe's* correspondents very sensibly remarks, 'Is a doctor or a minister any better qualified than a druggist to determine the uses to which a person may apply poison after having purchased it? Or, do they keep any record of the name, occupation, residence, etc., of those to whom they grant these certificates? I believe the answer—No! will apply to both these questions. And I also believe that there is no druggist in the dominion who would knowingly and willingly contravene the law as it now exists, if he could avoid it. But the thing is impossible! There is scarcely any article in the whole Pharmacopœia which can strictly be termed "innocuous," and one-half of the stock usually found on the shelves of a drug-store might easily be termed "poisons." So that keeping to the precise letter of the law, a druggist would be compelled to give up his business and say with the Moor, "Othello's occupation's gone," or by infringing it, as in the instance now on trial, place himself at the mercy of any one who through spite or impecuniosity may see fit to visit him with the terrors of the law.'

"The druggist is the party with whom the responsibility of the sale of poisons should rest. The nature of his calling presupposes an intimate knowledge of their properties and uses; of these matters he is certainly a better judge than the priest or minister. His standing in the community is, as far as morality is concerned, as high as any. Care and watchfulness form an essential part of his education, and, in this respect, he is not a whit behind the physician. We are not unduly sounding the praises of the class we represent, for we find that others entertain an equally high estimate of the character of the profession. On this subject a city contemporary editorially remarks: 'As a rule the educated druggist is one of the most careful of traders. A high sense of responsibility governs his proceedings, whether dispensing or retailing his goods. Not a few of them can point to occasions on which even the physician's prescription has been corrected, and a catastrophe arising from a slip of the M. D.'s pen, averted by the watchfulness and intelligence of the dispenser.' Let the druggist be allowed to use his own discretion in regard to the sale of poisons, and in thus assuming the guardianship of the public safety, we are sure that the welfare of the community will not suffer.

"In speaking to druggists it is needless for us to remark that the passing of the proposed Pharmacy Act, as amended at the last sitting of the Legislature, would prove an effectual remedy for the evils and inconveniences with which both druggist and people are now harassed. It would ensure adequate qualification on the part of those engaged in selling poisons, and at the same time guarantee all that the law can ask in regard to their sale. We hope that druggists, as well as lovers of good order, will do all in their power to promote the passing of this measure, by representing to members of the House, with whom they may have influence, the true state of affairs and the great necessity for putting this vexed question of poisons on a just and solid basis."

The Pharmaceutical Journal.

SATURDAY, JANUARY 7, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

THE OPENING YEAR.

THOUGH the present number is neither the commencement nor the conclusion of a volume, the fact of its being the first to appear this year will, we hope, be received as a sufficient excuse for a brief allusion to some of those points of pharmaceutical interest which may be expected to constitute for us characteristic features of the year now opening.

First, in regard to the general organization of pharmacy, as a business in which the interests of the public demand above all things certified competence in those who practise it, we may expect that measures will be taken to secure for Ireland the same advantages as we now enjoy in other parts of the United Kingdom.

In the matter of education, which is now engaging the earnest attention of all classes of the community, we may expect that pharmacists will be no exception; but that the means by which rising members of the trade may acquire that thorough knowledge of chemistry, botany and the materia medica, which is as essential to an accomplished pharmacist as the practical training gained during apprenticeship, may be developed and made still more generally accessible than they are at present.

Within the year now opening we may also expect the Pharmaceutical Society to take an important step in reference to the storing of poisons, by deciding whether or not it will prescribe regulations for that purpose. In this respect the forthcoming Annual Meeting of the Society will probably be one of unusual interest.

The alteration of the laws relating to patent medicine stamps and licences, will probably be dealt with during this year.

Among the prominent events of the year, the second meeting of the Conference, north of the Tweed, must not be forgotten, and while the fact that it is to be in Edinburgh will be an earnest of its brilliancy to all who know Scotland, it will be especially so to all who remember the success of the meeting at Dundee.

Last, but not least, we may be permitted to hope that within the present year any question which may remain as to the desirability of altering this Journal from a monthly to a weekly issue may be disposed of. We will also take this opportunity of addressing ourselves to all who are interested in the success of this Journal, as the property of the Society and the organ of its Council, to solicit from them such individual assistance as they can afford, with the object of rendering it a worthy representative of British pharmacy. There are probably few, if any journals connected with pharmacy which enjoy such advantages as this one, but we are inclined to believe that its general character no less than its utility might still be largely enhanced by the freer cooperation of those practically engaged in the business of pharmacy throughout the country.

We desire to return hearty thanks to those who have spontaneously come forward and given their help by contributing information, news and comments on matters of interest to the trade. We hope such contributions will still continue, and that they will become more general under the conviction that they may tend to the good of the entire body.

Nor must we forget to thank some grumblers who have favoured us with complaints which we have found both useful and beneficial in their influence, for we fully recognize the obligation of making this Journal generally acceptable and interesting, while at the same time endeavouring to perform the duty of elevating and leading opinion in all matters with which it is concerned.

In conclusion, therefore, we ask not only for the assistance of all who approve our endeavours, but also for the complaints of those who disapprove or are unsatisfied, and if these requests be responded to as we desire they may be, we do not doubt that the new year will be as prosperous for the Journal as we hope it will be for all its readers.

DISPENSING CHARGES AND ALLIANCES.

WE think the Pharmaceutical Society would lose influence if it responded to the suggestion of correspondents by promulgating a scale of dispensing charges. We by no means underrate the importance of the question of proper remuneration, but unless we were prepared to advocate uniformity of price (which appears to us eminently calculated to repress the best kind of emulation), we must leave the actual determination of prices to the judgment and good sense of the parties concerned.

Fixed rates are not, according to our experience, adopted by other trades, and the difficulty of assessing them is increased by the semi-professional nature of dispensing operations, in which personal qualification and reputation become positive elements of market value. In the professions there is still greater elasticity, and we see that one barrister will demand a hundred guineas for services which another would willingly render for ten, without concluding that the first is extortionate or the other unprofessional. If we offer any advice at all upon this tender topic, it will be to recommend our readers to follow the barrister's example, to be a little more independent of the conduct of others, and to have more confidence in right principles of business, which it should be their object to discover and to practise.

But while we hold ourselves apart from the contentions of Mr. A. with his neighbour Mr. B., we are thoroughly cognizant of the points involved, viz. the honour and credit as well as the pecuniary interests of Pharmacy; and in promotion of these objects we propose to divert our readers' attention from a personal to a general discussion upon which an expression of opinion may exercise some beneficial effect:—we have in view the alliances more or less overt between members of the medical profession and pharmaceutists.

It would be impossible to specify the many forms under which these alliances exist. Some have recently been brought to view in the correspondence columns of this Journal, and have elicited the disapproval of the medical profession as well as of our own body. Whatever the precise character of the compact may be, the essential feature is that the doctor hands his patients over to a particular chemist, and in some shape or other receives a premium for so doing. We will speak only of the more avowed and, to our thinking, the least objectionable arrangement, where the doctor is the ostensible purveyor of the medicines, the chemist acting as his dispenser or agent. In these cases the doctor receives the full remuneration for work *which he does not do*, while the pharmaceutist is preposterously underpaid for the work which he does,—only receiving, in fact, about half the remuneration to which he is fairly entitled for his services.

What then is the operation of arrangements such as these, and how do they affect the interests of pharmacy collectively and of individual pharmaceutists? These questions deserve the thoughtful consideration of our readers. Obviously the effect is to lessen the remuneration fairly earned by pharmaceutical labour, in order that the lion's share may be appropriated by members of the medical profession to whom it does not legitimately belong, thus realizing that interested dream of the *Lancet*, which recently aroused so much pharmaceutical indignation. Why is it then that pharmaceutists will give themselves up in detail to that which they repudiate in gross? We fear that it is because they have not sufficient *esprit de corps* to refrain from snatching a selfish advantage at the general expense. But does it even yield a selfish advantage? We think not. Speaking with competent knowledge of the large percentage to which the working charges upon dispensing trade amount, we state our deliberate conviction that the customary prices of this sort of dispensing do not pay; and we know that this conclusion has been arrived at by many who have made the experiment. But if it does not pay in itself, it may be said that it brings other business which does pay, and is thus indirectly advantageous. Assuming it to be so, we are directed to the unfair operation of the system upon neighbouring chemists, who are compelled to see their own legitimate connection poached upon by an occult competition against which there is no defence, and we can imagine the jealousies which may and do arise from this cause; for such is the daily experience of those who are brought within the baleful influence of these combinations. A Nemesis does, however, attend them; for the faculty as a body have a reasonable mistrust of chemists who are too closely identified with this or that individual practitioner. Of course medical men recommend those pharmacies in which they have most confidence, and it is quite right that they should do so. We are no friends to artificial restrictions, and we claim a reciprocal freedom for our members who are often consulted as to the skill and reputation of professional men. Provided that no self-interest underlies these recommendations, the public is benefited, and no one has any just ground of complaint. Nor would we interfere with medical men who dispense their own medicines, which is often a matter of necessity to meet the circumstances of a scattered population. We do not expect that the practice of dispensing will be altogether given up by the medical profession; but in the interest of pharmacy we desire to see it reduced to its minimum, and we think that considerable diminution might take place without inconvenience to the profession or to the public. Unfortunately pharmaceutists have lent themselves to the perpetuation of the custom by these very alliances of which we have spoken, and by means of which they preserve the whole profit of the business to the doctor, who, being anxious to relieve himself from this irksome duty, would otherwise probably abandon it altogether.

We are aware that in the foregoing remarks we have only reproduced facts already familiarly known to our readers. It has not been our object to advance anything new, but to invite serious reflection upon an old abuse, and we trust that a laudable *esprit de corps* will bring such influence to bear upon this really important subject as will serve (not suddenly but surely) to put an end to a custom which is injurious to pharmacy, unjust to pharmaceutists and a fruitful source of misunderstanding and jealousy.

The programme of the London Chemists' Association for the next three months includes papers on the following subjects:—"The Preservation of Vegetable Substances," by Mr. E. Beynon; "Belladonna and its preparations," by Mr. R. Pick; "Filtration," by Mr. De Putron; "Structural Botany," by Mr. J. H. Jessop; and "Phosphoric Acid," by Mr. G. Brownen. The Annual Dinner will take place on Thursday next.

Proceedings of the Pharmaceutical Society.

PHARMACEUTICAL MEETING.

Wednesday, January 4th, 1871.

MR. HASELDEN, VICE-PRESIDENT, IN THE CHAIR.

The SECRETARY read the following list of Donations to the Library and Museum:—

Liebig's Familiar Letters on Chemistry, fourth edition: from Mr. Daniel Hanbury,—On Santonin and its Detection in the Urine: from Walter G. Smith, M.B.,—An Address on certain aspects of Medical Reform: from Mr. John Jaap,—Journal of the London Institution, first number: from the Institution,—Large specimen of Arsenious Acid, manufactured by Messrs. Drayton and Co., of Cornwall; also, Two Leaden Bullets found in a sample of Turkey opium: presented by Mr. Slater, of Romsey,—Specimen of the bark of *Cinchona Pahudiana* grown in the Darjeeling Plantations, India, and offered for sale in London: presented by Mr. J. E. Howard,—Specimens of a large parcel of bark obtained from *Cinchona succirubra* and *officinalis* grown in Ceylon and offered for sale in London: presented by Messrs. Jenkins and Phillips, Lime Street, City,—Specimens of *Pakoe kidang*, being the hairy stipes of *Alsophila lurida* of Hasskarl from Java: presented by Mr. Hanbury.

Professor ATTFIELD drew attention to a large photograph of the members of the American Pharmaceutical Association, which met last year at Chicago, a copy of which had also been presented to the British Pharmaceutical Conference. It was sent by Mr. Ebert, with the greeting of the Chicago College of Pharmacy.

Mr. HOWDEN remarked, with reference to the photograph sent by Mr. Ebert, that one of the leading pharmacists in Chicago, Mr. Buck, was an Englishman, a native of Rochester, and a member by examination of the Society.

Mr. HANBURY, referring to the specimens of *Pakoe kidang*, said they were the stipes of a large species of fern, covered with peculiar golden-brown hairs that formed a very pretty object under the microscope. This hairy substance was extensively used in Java and the adjacent parts as a mechanical styptic, but he was not aware that the plant possessed any active medicinal properties.

PHARMACY IN AMERICA.—*Adjourned Discussion.*

Mr. HOWDEN said there were one or two points of detail, with reference to pharmacy in America, to which he might allude as an introduction to the evening's discussion. First, he would mention a very ingenious and pretty device, in common use in the States, for washing soda-water tumblers, which, owing to the shortness of the hot season in England, might not be worth while to introduce here, but would doubtless find its way into Continental cities and warm latitudes. On almost every soda-water counter in America was to be seen a silver or plated salver, surrounded by perhaps a dozen inverted tumblers, upon the inside of each of which played a jet of water, so arranged as to strike the inside of the glass obliquely, and so communicate to it a rotary motion, it being balanced on the centre. The weight of the tumbler acts on the stopcock through which the jet flows, so that on the removal of the glass there is no escape. Another curious thing to an Englishman, in connection with pharmacy in America, was that no coin of any kind ever passed over the counter, payment for everything being made in bank-notes or greenbacks.

When visiting the College of Pharmacy in Philadelphia, he heard a very interesting lecture from Professor Parish, the subject being "Specific Gravities." The lecturer particularly impressed upon the students the importance of taking proper precautions in ascertaining specific gravities,—the fact being that it is customary for physicians to request pharmacists to perform analyses of the urine of patients suffering from diabetes and similar diseases, proper fees of course being charged. Professor Parish also called his attention to a drug extensively used in America for coughs, etc., which he thought might advantageously be introduced into English medicine, viz. Wild Cherry Bark, or *Prunus Virginiana*. It was used in the form of a syrup, many hundred gallons being consumed, and its advantages were that it combined the properties of a pectoral and tonic medicine. He also called his attention to syrup of ipecacuanha made by treating the powder with spirits of wine, distilling off the superfluous alcohol until the residue became thick, then adding acetic acid and water, boiling, and adding sugar to the liquor when cool. This was recommended as superior to ipecacuanha wine. With reference to the subject of specific gravities, it had occurred to him that, whereas the specific gravities of all the preparations in the Pharmacopœia were given at a temperature of 60°, it would be very difficult to test them in that way in many parts of the world. No doubt 60° was a very convenient standard in England, but now that the art of pharmacy was extending all over the world, it must be remembered that many of their brethren were placed under great disadvantages in that respect, as he had had opportunities of noticing in America. In many cities there the temperature was never below 90° in the summer; while at a place called Minniapolis, to which it was usual to send patients afflicted with phthisis, the thermometer during the winter often stood as low as 45° below zero, the mercury freezing in the bulb. Now there was a growing practice in the States of buying drugs not from wholesale dealers, but from a class of men who might be called brokers, who sold by sample and delivered the goods in small original packages as imported. It was of great importance to the chemists that they should be able properly to test the purity and strength of the remedies thus furnished them; and, therefore, it appeared to him that it would be a great boon not only to Americans, but also to chemists in the colonies and various parts of the world if tables were issued under the authority of the Pharmaceutical Society, giving the specific gravities of the more important articles of the materia medica at temperatures ranging from 32° to 100°. Such tables might be found here and there, but they were incomplete and without authority. In conclusion, he desired to recommend every member of the Society, as far as opportunity allowed, to exercise hospitality towards the large number of strangers of their own profession who were constantly visiting London. He had met with so much kindness when travelling through the States that he could not but contrast the two national characteristics in this respect. Not that an Englishman's heart was not warm, but he often did not take proper means to let the heat radiate. He did not allude to knife-and-fork hospitality, but to a readiness to sacrifice time, and take a little trouble to show a stranger those objects in London which would be most interesting to him, such as Kew Gardens, the Botanic Gardens, and their own Museum and Library. If this were carried out more extensively both by the individual members and by the Society itself, he believed it would have the effect of raising up a number of friends throughout the world to remember the kindness which had been shown them throughout their lives.

Professor ATTFIELD said Mr. Howden was perhaps not aware that in nearly every London hospital a notice was exhibited informing strangers and visitors that they were invited to inspect the arrangements, and that if they would be good enough to make themselves known all possible attention would be offered them. In their own Institution scarcely a week passed, and sometimes not a day in a week, in which some stranger was not shown everything he desired to see by one of the officers. Perhaps as much had not been done as might be in pointing out the objects of interest in the metropolis, but it must be remembered that London was a large city. It might, however, be desirable that such a notice as he had described, should be exhibited in the hall, so that any stranger would at once see on entering that he would be welcomed and that every attention would be afforded.

Mr. Carteighe desired to know if the figures given in Mr. Howden's address—as printed, with regard to the salaries paid to assistants—were strictly accurate, because, although £100 to £250 as a maximum seemed high compared to what was paid in England, yet when the different circumstances and arrangements were taken into account, and the enormous expense of rent, food, etc., he did not think assistants in America had much to boast of. Again, with reference to the practice of prescribing, he had been much pleased at learning that every prescription went to the druggist, who received them by tens and hundreds daily, but since then he had seen in the *Medical Times* an abstract from a paper read before the King's County Medical Society in New York, in which the author complained much in the same strain as medical men did in England, of the large amount of prescribing done by druggists, at the same time acknowledging that a certain section of the medical profession were in the habit of compounding their own drugs. He wished, therefore, to ask Mr. Howden whether it was not possible that in his travels he had come in contact only with the *élite* of the pharmacists and of the medical profession, and so obtained an impression which did not quite adequately represent the facts with regard to the majority of the trade.

Mr. Howden said he had taken great pains to establish the accuracy of his facts, from the time he entered the States until he left. In every place he visited he inquired, not of one but of several pharmacists the amounts they paid their chief clerks, and the figures were those quoted by Mr. Carteighe. As a rule, the outside limit was £200 a year; but in Chicago, and one or two large and wealthy cities, this sum might be exceeded. With reference to the other question, he had been assured most emphatically over and over again, without a dissentient voice, that pharmacists had nothing to do with dispensing; that they steadily discountenanced it. At the same time it was admitted that there was sometimes a difficulty in preventing the younger men from prescribing for persons with trifling maladies; but, as a rule, prescribing was avoided both by principals and assistants. If done at all, it was practised by the less prosperous members of the trade, who carried on business in obscure districts, but they were not countenanced in so doing by the more respectable members of the profession. On the other hand, some of the less successful members of the medical profession encroached somewhat upon pharmacists' prerogatives, some of them being partners in drug stores, if they did not keep them themselves. Still this was done on a very small scale relatively, and generally in outlying districts, where civilization had not yet been thoroughly established.

Mr. Hanbury asked if he had correctly understood that druggists were in the habit of keeping original prescriptions, furnishing the patient with a copy if he required it? He did not think such a practice could be followed in this country.

Mr. Howden said it had been the practice in America from the earliest times for the chemist to retain the prescription, but not to furnish a copy; thus the first person who dispensed a prescription retained a sort of proprietorship in it. This was one of the points on which the Americans prided themselves on being ahead of the old country.

Professor Bentley said the thanks of the Society were due to Mr. Howden for the practical details and interesting information he had given with regard to pharmacy in America. Nothing could be more interesting or useful than for gentlemen who had travelled to come forward and give the result of their experience, and he believed that high as Pharmacy stood in this country, there was much to be learned from other nations. He cordially concurred in the remarks which had been made with regard to showing hospitality to strangers, but every one who knew that Society would be perfectly aware that immediately on entering the doors and asking for the Secretary or any of the officers, they would at once meet with every courtesy and attention. In times past the same facilities had not been afforded. Now, however, the doors were thrown open, and they expected that every pharmacist, from whatever country he came, would walk in and make himself as much at home as might be. Perhaps, however, it would be well if a notice were inserted in the Journal, that visitors from abroad would have the *entrée*, and that every facility would be given to persons desirous of information. There was, no doubt, much to be learned from America in the way of new remedies; for instance, podophyllum had been in constant use in America long before it was introduced to this country, but it was now becoming appreciated, and had been included in the Pharmacopœia. The same with regard to the remedy mentioned by Mr. Howden, *Prunus Virginiana*, which was much approved of by those who had tried it, particularly the Scotch physicians. He would therefore repeat a remark which he had often made before, that it was very desirable in issuing new editions of the Pharmacopœia, to follow the plan adopted in America, and issue a "secondary list" of new remedies which had not yet been experimented on and thoroughly approved. By this means new remedies had an opportunity of being tested; if they were worthless, they would soon be thrown on one side; if they were valuable, they would take their places in the regular list in future. He wished to know if he had correctly understood Mr. Howden that it was the practice of physicians, when they wished to test the urine or any other secretion of their patients, to hand it over to the pharmacist instead of doing it themselves.

Mr. Howden said he inferred from the minute instructions given to the students that this was the practice. It must be remembered that in America every one was called a physician who practised medicine, many not having any diploma at all.

Professor Bentley said he did not think any competent physician would do as was suggested.

Professor Attfield said that during the past four or five years he had had a very large number of applications from different pharmacists throughout the kingdom for short directions which would enable them to take the specific gravity of and otherwise chemically test urine for medical men, so that it was evident there was demand in this country for such knowledge on the part of chemists. This had induced him to write a short article, which was published in the 'Chemist's Almanac' for 1870, and in his own 'Manual of Chemistry,' and to his knowledge it had been extensively made use of. It was well known that medical men had not always the opportunities of testing specimens of urine, and that it could be more quickly done by instructing the patient to take it to a neighbouring chemist than by themselves taking home the specimen and testing it in their own surgeries. With regard to the temperatures at which specific gravity was taken, there could be no doubt that a table, such as Mr. Howden had referred to, showing the specific gravity of official articles at three or four different temperatures, would be very useful. Such data were given with regard to certain matters in several works on chemistry, and if this were carried out for most of the official articles it would be one of the most useful tables that could be compiled. This work could be well undertaken by any young pharmacist who was anxious to distinguish himself, and it might well form the subject of a paper at any future meeting. Similar work had been done by an associate of that Society a short time ago. He referred to the table compiled by Mr., now Dr. Watts, who was then an associate, which showed the strength of solutions of phosphoric acid of different specific gravities, and that table had since been introduced into nearly all the text-books of chemistry recently published.

Mr. Howden said it must be remembered taking specific gravity was not entirely an intellectual feat; it could not be done by means of any formula of proportion. A table to be useful throughout the world could only be arrived at by actual experiment, and frequent experiment on each substance, because the capacity of the bottle altered with the temperature, and no formula could meet that.

Professor Attfield said a much greater difficulty was this, that whereas the expansion of all gases for equal increments or decrements of temperature was the same, the expansion of liquids varied with almost every substance, and hence the experiment would have to be performed with every separate liquid included in the table.

The Chairman said he quite concurred with what had been said as to the usefulness of such a table. With regard to hospitality and attention shown to foreign visitors, he did not think Mr. Howden intended to convey that there was any lack on the part, either of their Society or the public institutions in this country, but rather that sufficient public notice was not given of their desires in that respect. Last year Professor Soubeiran visited the institution, attended the examinations for an hour or two, and afterwards visited the Conversazione at South Kensington Museum; and it was constantly the case during the session, that they had visitors attending the examinations and the other work of the institution. He thought, however, it might be possible to make it more publicly known that visitors would be welcomed.

Note on Australian Opium.

The Chairman then called upon Mr. J. S. Ward to read a paper giving the results of an examination of a specimen of Australian-grown opium. The paper will be found printed *in extenso* at p. 543.

Mr. Hanbury said he did not quite catch whether the juice which exuded after the scarification of the capsules was allowed to harden on them before it was collected. It would also be interesting to know whether the capsules were scarified longitudinally, or transversely as was done in Turkey.

Mr. Ward said he had no information beyond that contained in the letter which he had read; but as it stated that a person followed immediately after the one nicking to collect the drops, he should say it was collected when in a soft state.

Professor Bentley said on first exuding, the liquid would be absolute juice, and would be, he should imagine, very difficult to collect.

The Chairman said the opium question was very interesting just at present, on account of the high price of the article. No doubt there was a large demand for its use on the Continent, and anything which would lead to a diminution of price would be of great advantage to every one.

Mr. Howden said one reason for the increase of price was to be found in the enormous consumption in the United States, there being one firm in Philadelphia alone which could sweep the whole of the London market. With reference to the cultivation of opium in Australia, it was very much to be desired that experiments on the growth of plants in various climates and countries should be encouraged, but the results should be regarded with considerable suspicion until the medicinal virtues of the product could be accurately ascertained. The climatic difference in the growth of plants was something enormous, and in some cases it entirely altered the nature of the production. For instance, henbane and belladonna produced very valuable remedies when grown in this country, but in the United States the same plants had no medicinal value whatever. The cereals were, of all plants in the vegetable kingdom, those which bore transplanting with the least injury, growing with wonderful success in all parts of the world; indeed, it is well known that corn from Dantzic, the coast of Chili and Australia was absolutely better than that grown by the best English farmers. But this, however, was not the case with many other plants, and in the matter of drugs careful experiment was necessary to verify the results.

The Chairman asked if the consumption of opium had increased rapidly in the United States, because the price had gone up all at once, and, in fact, had been higher at one time than it was now?

Mr. Howden said large portions of the interior of the American continent were perfectly level, so that you could ride for hundreds of miles over land as flat as the table. The nature of the soil was most prolific, producing most wonderfully fine root-crops; but, as might be expected, the drainage was indifferent, and he had been painfully conscious of the presence of sulphuretted hydrogen gas, not in particular localities, but over areas many miles in extent. This naturally produced ague and low forms of fever, and from some occult reason it was quite certain that wherever this tendency existed the consumption of opium kept pace with it. This was seen in our own eastern counties, where laudanum and opium were used to a much greater extent than in the hilly districts. No doubt when these districts become more thoroughly civilized, and better systems of drainage were adopted, the consumption of opium might decrease.

Professor Bentley said there was really not much information in the paper on the most important point, viz. whether opium could be profitably cultivated in Australia? Even in England it could be produced sometimes of very fair quality, and he believed there were specimens in the Museum which had been found to contain 10 per cent. or more of morphia. The point was not whether a particular specimen could be produced, but whether on the average of summers there was such an amount of light and heat as would enable the cultivator to grow it to commercial advantage. The question raised by Mr. Howden was one of great interest and importance, viz. the influence of climate, culture and soil on the growth of medicinal plants; and he did not know anything more likely to yield useful results than a series of experiments on this subject; but they must be carried out with the greatest care and exactitude. He believed that much of the uncertainty of the action of medicines, in consequence of which blame had sometimes been thrown on chemists in times past, was due to the difference in the plants supplied to them. It was well known that a plant grown in one district would differ very materially in its properties from those grown in another.

Mr. Butt asked if the opium were analysed in a dry state, or when of the usual consistence of Smyrna opium, as this would make a considerable difference in the percentage of morphia.

Mr. Ward said he analysed it towards the end of August, when it was quite soft.

Mr. Hardcastle asked if it had ever been decided which variety of the poppy was best for opium-producing purposes, regard being had to quantity or quality or both.

Professor Bentley said there were only two main varieties used, the white and the black, and opinions varied as to which was the best. The white was more largely cultivated in some districts, but, as far as he knew, careful investigators were unable to find any appreciable difference between the two.

Mr. Umney said if the cultivation of the poppy could be carried on in Australia on a large scale, a quarter of an acre yielding 14 lb. of opium, it would be a fine speculation, as the land would realize from £70 to £80 per acre.

Professor Bentley said there was the seed in addition, which in India paid all the expense of cultivation.

Mr. Carteighe said he was sure Mr. Ward would not go away under the impression that the criticisms passed upon his paper had any personal bearing, since they were founded on the lack of information furnished by his correspondent. At the same time, it could not be denied that the paper lost much of its value from this cause, and Mr. Ward would be doing good service if he would obtain from Mr. Francis further details, which no doubt that gentleman would be happy to furnish.

The Chairman announced that on February 1st and March 1st Dr. Carpenter would give two lectures on the microscope.

Vinum Ferri.

Professor Attfield said he proposed at the next available meeting to read a paper on "Certain Precautions to be Observed in Making Wine of Iron." He should be glad to hear, in the meantime, from any one who had met with new difficulties in preparing this article. It was well known that during the last year or two malt liquors had had a very small quantity of solution of bisulphite of lime added to them, which had proved serviceable in preventing alteration, and it would seem that the process had been extended to wine, especially the cheaper kinds of sherry. The consequence was, that when this was used for making wine of iron, a reduction of the sulphite took place, sulphuretted hydrogen was generated and the sample was spoiled.

Mr. Butt said he had found it impossible to avoid the disagreeable sulphuretted hydrogen smell, although he had tried iron wire, iron filings, iron borings, and different samples of sherry.

Mr. Howden inquired if the sherry had been taken from the wood or from bottle, because it was known that bisulphite of lime was used to a great extent in bottling both wine and beer.

Mr. Butt said he had used it from the bottle and from the wood, and both low and high priced sherries, and always with the same result. It appeared, therefore, that the bisulphite was used both in this country and abroad. They used what was called "the sulphur match" in this country, to bring round inferior wines, to a great extent.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fifth General Meeting of this Association was held at the Royal Institution on Thursday evening, December 22nd; the President, Mr. John Abraham, in the chair. There was a numerous attendance. The minutes of the previous meeting were read and confirmed. Mr. Joseph Roberts was elected a member. Mr. W. T. Case was elected an associate.

Donations of the *Chicago Pharmaceutist*, *New York Druggists' Circular*, *Pharmaceutical Journal*, were announced.

The Honorary Secretary, Mr. Alfred H. Mason, read a paper upon "Chloral Hydrate, Alcoholate, Tests, Therapeutical Value, Pharmaceutical Preparations." (See p. 541.)

The President said the members were much indebted to the author for the paper they had just heard. He did not know that there was so much difference in the samples of hydrate of chloral which were offered for sale; he confessed he felt it was still a medicine of which little was known. He had always purchased his supplies from the first houses, without reference to price, and thought he was getting the right thing.

Dr. Nevins, Lecturer on Materia Medica, etc. at the Royal Infirmary School of Medicine, Honorary Member of the Association, said, that lately he had found that in administering hydrate of chloral, in any form, it produces unpleasant results upon the patients, nausea, headache, sickness, and sometimes vomiting. When the hydrate was first introduced none of these symptoms were present; but he thought the paper they had just heard would somewhat explain this. He drew attention to the fact that the administration of hydrate of chloral in many cases caused great languor and depression. He found it necessary to guard against too long continued doses, as sometimes, quite unexpectedly, unfavourable symptoms presented themselves. Of course the effects of hydrate of chloral differed like those of any other medicine, with different constitutions. He also called attention to the large quantity of caustic alkali used to set free the chloroform, and said he thought it impossible that as much alkali would be found in the blood of a patient.

Mr. Edward Davies, F.C.S., said the subject was one of great importance, and he was very much struck with the serious differences between the salts examined, which had been laid before them. Theoretically the products of decomposition of the alcoholate would be very different from the hydrate of chloral. He urged that in order to obtain a good result one article alone should be used in dispensing. He thought they were much indebted to Mr. Mason for bringing forward proof that there was a great deal of alcoholate of chloral in the market. The two preparations should not be indiscriminately used for the same class of cases. If any one wanted to ascertain whether alcoholate of chloral was a good remedy in other cases, well and good, but he thought it very probable that medical practitioners were now using alcoholate where formerly they used hydrate of chloral, and because they found ill effects where formerly they found benefit, they were apt to decry the hydrate of chloral.

The President spoke of the manufacture of chloral, and much doubted whether any was made in this country. He believed it was all imported from abroad, principally from Germany.

Mr. A. H. Mason said some crude hydrate of chloral had been recrystallized here, as he had been furnished with a small sample, but not sufficient to carry through the course of his experiments. Messrs. Dunn, Squire, and Co. advertised in the medical papers that they were manufacturers, and they had kindly supplied him with samples of the crude and cake hydrate of chloral, of which he had already spoken.

A short discussion followed, in which several members took part.

The President moved a vote of thanks to Mr. Mason for his interesting and instructive paper, which was seconded, in very complimentary terms, by Dr. Nevins, and carried unanimously.

Mr. Mason acknowledged the vote, and the meeting adjourned.

Proceedings of Scientific Societies.

ONTARIO COLLEGE OF PHARMACY.

At the regular November Meeting of this Society, an informal conversation took place upon the criminal prosecution of nearly all the Toronto druggists for selling laudanum contrary to the "Poisons Act." Eventually it was resolved to adjourn the meeting until after the magistrate's decision.

At the adjourned meeting the President said that, although the magistrate's decision had been twice postponed, it had been thought best to call the members together, as the Ontario Legislature had assembled, and it would be advisable to take action with regard to the proposed Pharmacy Bill.

After discussion, it was decided that as most of the members of the Society were non-resident in Toronto, the Society could do nothing with respect to the prosecution, but must leave it for the druggists of Toronto to deal with as they might think best.

Mr. R. W. Elliott said the Pharmacy Bill was crowded out last session, partly through a press of railway business and partly through the supineness of the gentleman who had charge of it. It was for the meeting to say whether it would be advisable to place it in other hands.

A committee was appointed to confer with the Attorney-General, and take such action as they might deem best for obtaining the desired legislation.

PHOTOGRAPHIC SOCIETY OF LONDON.

December 13, 1870.

On Xylonite, a Material applicable to Photographic Purposes.

BY DANIEL SPILL.

The name "Xylonite" is taken from the Greek word *xulon*, "wood," and the material upon which this name has been bestowed is derived from wood or woody fibres. These are converted, by the action of mixed nitric and sulphuric acids, into a rough form of xyloidine, which, being subsequently dissolved into a species of collodion, constitutes the base of a further manufacture.

The material was first introduced to the notice of the public, at the International Exhibition of 1862, by Mr. Alexander Parkes, of Birmingham, at which time it had not yet become an article of commerce; subsequently it was manufactured on a commercial scale, and introduced to the world for a short time under the name of "Parkesine" (named after the inventor). The manufacture having been much improved, and the patented solvents and machinery almost entirely remodelled, it was considered advisable that the name should also be changed, and "Xylonite," as being more appropriate for a derivative of xyloidine, was adopted.

The soluble base of this manufacture may be made from any wood or woody fibre, or fibre-producing grasses, old rags, waste from cotton or flax mills, old rope, starch, Esparto grass, "half-stuff" of the paper-makers, etc., but preferably using waste fibrous material from cotton and flax mills. Either of these substances which may be chosen should be first freed from all extraneous matter by boiling with alkali or soap and water, well washed, and dried, so as to leave nothing but a nearly pure fibre for the subsequent treatment. A bath composed of one part, by weight, of concentrated nitric acid, four parts of concentrated sulphuric acid, and one of water, having been prepared and cooled to about 70° or 80° F., a weighed quantity of the purified vegetable fibres is then immersed therein for a period of from one to fifteen minutes or longer, according to the degree of solubility required. The next step is to remove the uncombined acids as quickly as possible, either by draining or pressure (the latter preferred), and then wash quickly in a copious supply of water until the last washings are neutral to test-paper. If the fibre should at this stage retain any colouring-matter (which is not unfrequently the case), it may be submitted to the action of any of the ordinary bleaching agents without injury to the chemical condition of the xyloidine, which, after it has been carefully dried at a low temperature or by pressure (the latter being preferred), will be ready for dissolving. The solvents commonly employed in the preparation of photographic collodion are too expensive to permit of their use in the xylonite manufacture. The volatile solvents mostly used are wood-spirit, alcohol, aldehyde, mineral naphtha, benzole, and other hydrocarbons; and the non-volatile or fixed solvents are oil and camphor, or natural camphor-oil, linseed, castor, and other vegetable oils. The introduction of these fixed solvents is an important improvement and economy in the manufacture of xylonite, obviating much loss by evaporation and inconvenience arising from contraction of the material. To prepare these solvents, take, say, 100 parts of castor-oil and heat to about 250° or 300° F., then dissolve therein about 50 parts of camphor; while in the heated condition add the xyloidine, which readily dissolves into a stiff paste, and is then ready for a subsequent process. The condition of xylonite may be varied from the flexibility of morocco leather to the hardness of ivory or stone by the judicious combination of xyloidine, oil, and pigments.

Practically it is not necessary to dry the xyloidine thoroughly before dissolving it; pressure alone will remove 90 per cent. of its moisture; in this state it is quite uninflammable, even when held in contact with fire, and yet will readily dissolve in the before-mentioned solvents. Five parts of solvent will reduce one part of xyloidine into a stiff paste by stirring alone; but to blend the materials more perfectly the mixture is masticated or ground between rollers until the incorporation is completed; it is next removed into a strong vessel having a perforated bottom covered with a finely-woven wire sieve, which vessel is then placed beneath the piston of a powerful press, and the paste is thereby forced through the sieve, in order to strain it from all mechanical impurities or undissolved particles of xyloidine. This purified xyloidine is next removed, weighed, and the requisite quantity of oil or pigments added thereto, and then passed to a heated masticator or grinding-rolls, or into a retort provided with mechanical stirrers, which, for volatile solvents, are enclosed in an air-tight casing, the latter being in connection with a condenser and vacuum apparatus during the process of mastication or agitation. The volatile solvents are evaporated by the heat and vacuum, and conveyed away to a condenser for future use. When non-volatile solvents are used, the last-named apparatus is not required, heat and mastication being sufficient. When the paste is masticated into a very stiff condition, it is removed into a powerful calendering-machine, where it is rolled into sheets of any required thickness, after which it is placed in a seasoning-room heated to 100–120° F. for periods varying from fifteen to thirty days, when it is ready for use.

When preparing hard compounds with the non-volatile solvents it is necessary to use oxidized oil, such as linseed-oil, which will dry and become hard in the process of seasoning. The flexible kinds are prepared with cotton-seed-oil or castor-oil, which will *not* become hard. For coating or waterproofing fabrics, the paste may be applied in a semifluid condition with an ordinary india-rubber spreading-knife or machine, or it may be applied in a very stiff paste by the aid of calender-rolls.

In preparing non-actinic sheets for photographic purposes, no pigments are used, but semitransparent colours only, such as will arrest the passage of the chemical rays, and furnish a material suitable for windows of the dark-room in place of the ordinary yellow glass, but of sufficient depth of colour to arrest *all* the actinic rays of sunlight. In this state the sheets are flexible, durable and light. Spread upon fabrics it forms a waterproof material, useful for photographic field-tents, giving the operator an abundance of light of perfectly non-actinic quality, thus having a "dark" room combined with a considerable amount of light for personal comfort, and avoiding the use of yellow glass windows altogether. The applications for the material outside the photographic world are almost innumerable; a few of them may be instanced, viz. insulation and protection of telegraph-wire, coating fabrics for waterproof garments, making artificial leather for furniture-covering and book-binding, writing-tablets, substitutes for ivory, bone, horn, tortoiseshell, hard woods, marble, etc., knife-handles, friction and gear-wheels, also bearings for machinery, spinner's bosses, billiard-balls, pianoforte keys, walking-stick and umbrella handles, etc.

It may be turned in a lathe or wrought by the cabinet-maker's or brass-finisher's tools; can be embossed or moulded by heat and pressure, and may be polished like ivory, wood or stone. It is unaffected by atmospheric influences, heat, water, or grease.

The low combustibility of the xyloidine may be demonstrated by firing a portion on a plate, when it will burn slowly, leaving a considerable amount of carbonaceous residue.

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 9 P.M.
TUESDAY ......*Royal Medical and Chirurgical*, at 8.30 P.M.
Photographic Society, at 8 P.M.
WEDNESDAY *Microscopical Society*, at 8 P.M.
THURSDAY ...*Royal Society*, at 8.30 P.M.
Linnean Society, at 8.30 P.M.
FRIDAY ......*Quekett Club*, at 8 P.M.
SATURDAY ...*Royal Botanic Society*, at 3.45 P.M.

BOOK RECEIVED.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES; being a Digest of British and Continental Medicines. Edited by WILLIAM DOMETT STONE, M.D. Vol. LII. London: J. and A. Churchill. 1871.

Parliamentary and Law Proceedings.

ADULTERATION OF LARD.

In a late trial at Liverpool in which the plaintiff sought to recover the price of some lard which the defendant had returned as unfit for food, evidence for the defence was given by an analytical chemist that some of the bladders he had analysed contained a mixture of lard, mutton fat, rape oil and water, the latter in the proportion of 19 per cent. The Court ordered the plaintiff to take back the lard without payment.—*Food Journal.*

THE SALE OF LAUDANUM.

At an inquest held at Woodbridge on the body of a young woman, whose death was reported to have been caused by laudanum, evidence was given to the following effect:—

Harriett Thompson, a child aged twelve years, said that the previous morning the deceased had called her and asked her to go to Mr. Betts's, the chemist. She gave her sixpence, a piece of paper and a small bottle. A young man at the chemist's filled the bottle with something brown. There was a paper with printing on it stuck on the bottle. She could not read. She had often been to Mr. Betts's for the same kind of stuff, sometimes every day.

James Hartridge, apprentice to Mr. Betts, said he remembered a little child coming to the shop with a phial labelled "Laudanum." She asked for sixpennyworth, which quantity he put into the phial. It was also labelled "Poison." He took the laudanum out of the bottle from which they usually supplied people of that description. He had been with Mr. Betts only three months, and could not say the strength of the laudanum supplied. He had once or twice previously supplied the same child with laudanum. She had told him it was for Mr. Disbury.

John Betts, pharmaceutical chemist, said that on the previous Saturday the deceased had been supplied by him with fourpennyworth of laudanum. He had, on several occasions supplied her with sixpennyworth at a time, on the plea that she wanted it to ease the pain from which her mother, who was bedridden, was suffering. The laudanum supplied was half the strength of the London Pharmacopœia. It was not necessary to register the sale of laudanum of that strength.

Mr. Marshall, surgeon, said that he had made a *post mortem* examination of the body, and was of opinion that death had resulted from the diseased state of the liver and heart. He did not detect the smell of laudanum or any other poison. Had she taken the quantity stated to have been procured on the day of her death, he believed he should have detected it.

The jury returned a verdict of "Death from natural causes."—*Woodbridge Reporter.*

Obituary.

THOMAS WALLER GISSING.

OB. DECEMBER 28, 1870, ÆTAT. 41.

Our last number informed our readers of the sudden removal by death of a pharmacist known and esteemed by many of them, one whose life and character were distinguished by qualities which claim from his professional brethren a more detailed record. Such men as the late Mr. Gissing are, in a sense, the natural outcome of the calling of pharmacy, which, by introducing physical or natural history science to a congenial mind, often supplies the needed motive for action—action directed by the strong common sense belonging to trade in its best aspect, and when united to a capability of enthusiasm, soon associating kindred spirits with itself. It is from these social aggregations that we reap the fruit of progress, for man resembles the single palm-tree that bears no fruit when standing isolated from its fellows.

Thomas Waller Gissing was born at Halesworth, in Suffolk, on August 2, 1829, and there he received his education. He was apprenticed to a chemist and druggist at Ipswich, and afterwards held situations as an assistant in Leicester, Worcester and Salisbury. During a large portion of this period, Mr. Gissing was engaged in the business of Messrs. Whitfield and Son, of Worcester, and the PHARMACEUTICAL JOURNAL furnishes evidence of his active interest in botany at this time, as he established at Worcester a flourishing branch of the Phytological Club, which had its head-quarters at 17, Bloomsbury Square.

In the year 1856, Mr. Gissing succeeded to the business of Mr. M. B. Flick, at Wakefield, and how he spent the subsequent period is recorded by the *Wakefield Free Press*, as follows:—"We know of no tradesman who in the short space of fourteen years has done as much for the public, or done it so well, or gained such a position in the esteem of the town, or who has so well deserved the respect of all classes in the borough, as Mr. Gissing."

Amidst the claims of a business which demanded close personal attention, he found much time for his favourite pursuit of field-botany, and published two small works upon the local Flora, entitled 'The Ferns of Wakefield and Neighbourhood,' and 'Materials for a Flora of Wakefield.' He was an early riser, and often did a day's work before some men left their beds.

In 1857 he was placed upon the Committee of the Mechanics' Institution, and was at once recognized as one of its most energetic and intelligent members, subsequently taking the post of Honorary Librarian. He was a Member of Council of the Chamber of Commerce, the Secretary of the Wakefield Book Society, and an earnest working member of the Microscopical Society. The Industrial and Fine Art Exhibition, held in Wakefield in 1865, enjoyed a remarkable success, which was due to the well-directed efforts of a small band of voluntary workers accustomed to co-operate, and of these, none was more active than Mr. Gissing. The Lancasterian School, the Clayton Hospital and School of Art were institutions in the management of which he occupied a leading position. Mr. Gissing took a lively interest in politics on the Liberal side, and was a member of the Town Council; his last public act, on December

16, being to vote for the establishment of a School Board in the borough.

Mr. Gissing was Local Secretary of the Pharmaceutical Society, and was ever watchful of the interests of his profession, giving a zealous co-operation in promoting measures aimed at by the Society. His conduct in this position combined loyalty to the Society with independence of thought. It is not generally known that when the Pharmacy Act of 1868 was passing through Parliament, Mr. Gissing discovered that in the Bill first presented, two-thirds of the members of Council were to be drawn from London, only seven members being allotted to the rest of Great Britain. He energetically pointed this out in a quarter where his remonstrances received full sympathy, and an appeal being promptly made to the Local Secretaries throughout the kingdom, their opinions showed such unanimity that the Council removed the obnoxious clause. It can hardly be doubted that had Mr. Gissing's life been spared, he would before long have been elected on the Council of the Pharmaceutical Society. He was nominated at the elections of 1869 and 1870, and was almost successful on each occasion.

For a few years Mr. Gissing had suffered from what he believed to be chronic inflammation of the windpipe, which caused him considerable inconvenience and pain, especially in winter. An attack of cold confined him to the house for a few days, but his illness became suddenly alarming to his family, and he died on Wednesday morning, December 28th. He leaves a widow and five children, between thirteen and four years of age.

The funeral took place at the borough cemetery, when the Corporation, the members of the various committees to which Mr. Gissing belonged, and a large number of his fellow-townsmen testified, by their presence, their esteem for his memory.

The following journals have been received:—The 'British Medical Journal,' Dec. 31; the 'Medical Times and Gazette,' Dec. 31; the 'Lancet,' Dec. 31; the 'Medical Press and Circular,' Jan. 4; 'Nature,' Dec. 29; the 'Chemical News,' Dec. 30; 'Journal of the Society of Arts,' Dec. 29; 'Gardeners' Chronicle,' Dec. 31; the 'Grocer,' Dec. 31; the 'English Mechanic,' Dec. 30; the 'Journal of Applied Science' for January; the 'Canadian Pharmaceutical Journal' for December; the 'Woodbridge Reporter,' Dec. 30; 'Wakefield Free Press,' Dec. 31; 'Transactions of the Odontological Society' for December; the 'Educational Times' for January.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[34.]—AQ. CAMPH.—*C. U.* gives the following formula for a preparation that will serve for making aq. camph. extemporaneously:—

Camphor 1 oz.
S. V. R. (56 per cent.) 26 oz.

Dilute with 15 parts of water to make camphor mixture.

[*** Owing to the presence of spirit in camphor water so prepared, it would not be, strictly speaking, aqua camphoræ, B. P.—Ed. Ph. Journ.]

[56.]—HAIR-WASH.

℞. Glycerini ℥ij
Tinct. Myrrh. ℥j
Eau de Cologne ℥j
Tinct. Cantharid. ʒss
Aq. Destillat. ℥xxiv.
M. H. Q. S.

[93.]—PROOF-SPIRIT should *not* be made as directed by one of your correspondents, by adding to 100 parts of spirit at 56 *over proof* 56 parts of water, notwithstanding such a statement is to be found in standard works on pharmacy. A mixture in such proportions would be 2·9 over proof. When a spirit is said to be 56 *or* 60 *degrees over proof*, it means that to 100 parts of such spirit sufficient water should be added to make the product measure, when the contraction in volume has taken place, 156 or 160 parts at 60° F. The contraction in volume in mixing alcohol and water is not constant, but varies considerably when different proportions are taken. The maximum contraction is *almost* attained in making proof-spirit, in which case it is 2½ per cent. The British Pharmacopœia indicates that to 5 parts of alcohol, ·838 (56 overproof) 3 parts of water should be added (100 : 60). On no account should a further addition of water be made in making proof-spirit according to these directions, as another of your correspondents says is usually done in the proportion of 4 oz. to the gallon, or the spirit will be 2·3 under proof.—Chas. Umney.

[101.]—CHERRY TOOTH-PASTE.

Alum. Pulv. ʒss
Pulv. Iridis ℥iss
„ Cretæ ℥iss
„ Pot. Bitart. ℥iss
„ Oss. Sepiæ ℥iss
„ Cocci ʒj
Ol. Caryophyll. gtt. xv
Ol. Amygdal. Ess. gtt. xx
Glycerini q. s.

Mix. Allow it to stand in the mortar till the effervescence ceases, occasionally stirring.—A. A.

℞. Sapon. Gall. ʒi
Quinæ Sulph. ℈ij
Cretæ Præcip. ℥xvj
Magnesiæ ℥vij
Camphor. ℈ijss
Ess. Bergamot ♏xxx
Ol. Caryoph. ♏xxxvj
Otto de Rose ♏xxxx
Ol. Neroli ♏xxx
Liq. Cochineal, q. s.
M. H. Q. S.

[104.]—COUGH PILLS.

℞. Zinci Oxydi xlviij
Ext. Conii xlviij.

M. Divide in pil. xxiv. Dose, 1 night and morning.—H.Q. S.

℞. Pulv. Ipecac.,
„ Scillæ, ana gr. xij
Ext. Conii,
„ Taraxaci, ana ℈j.

M. ft. mist. Divide in pil. xij. Signa, j omni nocte sumend.—A. H. E.

[117.]—WATCH OIL.—"*Virtu*" will be glad of information as to the best *oil* for the works of a watch, and also clocks.

[118.]—STILL.—Can any one recommend a perfect *practical still* for counter use with a Liebig's condenser, giving maker's name?—Biondino.

[119.]—WHITE LIQUID GLUE.—Would any reader give me a formula for making white liquid glue? I have tried to prepare it with sulphate of zinc and hydrochloric acid, but it does not answer.—Pestle and Mortar.

[120.]—EMBOSSING STAMP.—Can any reader inform me where I can procure an embossing stamp the same as illustrated in Maws' Catalogue, p. 126, and price? I understand Maws are unable to supply them on account of the war. —A. H. Hale.

[121.]—SYRUPUS CROCI.—Will some one kindly give me a really good formula for syr. croci which will keep in good condition?—R. J. C.

[122.]—PERFUMED LIQUID AMMONIA.—*R. J. C.* wishes for a good formula for perfumed liquid ammonia for filling smelling-bottles.

Correspondence.

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

PROPOSED REGULATIONS FOR STORING OF POISONS.

Sir,—What ever could have moved the Lords of her Majesty's Privy Council to make the interesting inquiry touching the keeping, dispensing and selling of poisons? Surely they are confounding the serious loss of life which has occurred recently through railway negligence with accidental poisoning. I cannot otherwise understand their anxiety at this holiday time, seeing that no death for a very long period has been reported as arising out of a chemist's neglect or inadvertence. It certainly may help the Council of the Pharmaceutical Society in their high aims of compelling the use of curious cupboards and funny bottles with poison! poison! poison! staring you in the face, till you are so familiar with the word that its influence will be lost.

After the many powerful letters which have appeared in the Journal, showing the absurdity and folly of poison regulations, I feel it is of no use to argue any more upon the subject, but be present at the next General Meeting of the Society, there make your voice heard, resolved to vote only for members of the Council who will pledge themselves to resist the proposed offensive regulations, proclaiming us to society as wholly incompetent for the responsibility which our profession involves!

Kilburn, Jan. 2nd, 1871. JOHN BEATON.

Sir,—By the publication of Dr. Simon's letter from the Medical Department of the Privy Council, the kind of pressure—which to the outside world has apparently put to flight the sagacity of the Pharmaceutical Council—is exhibited to the members themselves. Whether this mighty and portentous missive be a genuinely unsolicited production, to be held *in terrorem* over the heads of refractory members I do not know. We have, however, now the issue placed before us, and if we rouse ourselves I do not fear the result. The position of those opposed to compulsory dispensing poison regulations, with their concomitant corps of inspectors, is, I believe, sufficiently unassailable to withstand, not only most searching criticism, but even parliamentary discussion if this undesirable ordeal be brought about. We have simply at this particular crisis to face the difficulty which the injudicious action of the Council has produced, and defeat any further attempt at Governmental trade restriction. The Pharmaceutical Council seems to think itself bound, either by coercive influence or by an imaginary sense of obligation, to move in this matter; yet if the Pharmacy Act be consulted, it will be found that the introduction of additional regulations is perfectly optional, and in no way obligatory.

The settlement of this question, if no fairer mode be proposed, will be made at the next May meeting by those who are able to attend to give their votes, but how many are there who cannot possibly be present to resist or approve? Anything like a majority of the members, however anxious they may be to vote, will not be present. Hence how flagrantly unjust is this process of arriving at a decision! Is it really needful for us to make a humble and dutiful pilgrimage to Bloomsbury Square, at a sacrifice of time and money, to record our votes? The well-to-do magnates of the trade may be able to afford the time and money, but there are many whose voice in this matter is worthy of being heard who, simply from economic reasons, will not be able to attend. The voting in London in May, if it takes place, will not give a just reflex of the opinions of the members. The greater the distance from London, the fewer the votes that will be recorded. What objection is there to the issuing of voting-papers to every member of the Pharmaceutical Society, so that every member may be enabled to exercise his rightful influence in the settlement of the vexed question? By this means, and by this alone, is it possible to obtain the opinion of the members. If the Council honestly desire, as in duty bound they should, to elicit the opinions of the whole of the members, and if they do not wrongfully wish to carry with a high hand their unwise resolve as to the *compulsory* poison regulations, spite of protest and threatening discord, they will at their next meeting at once decide to use voting-papers instead of the arbitrary decision of an annual meeting.

Manchester, Jan. 3rd, 1871. ROBT. HAMPSON.

Sir,—The keeping and storing of poisons is now a matter of much importance, indeed it is perhaps one of the subjects that interests and concerns the whole trade more than any other. Therefore I trust a few further remarks on this controversy may not be unacceptable. In the first place I will say, it is with sincere regret that I find there are such dissensions on this matter; and although much has been written and said, we are still in a state of unsettlement from so many entertaining such different and tenacious opinions.

The Journal of Dec. 21st contains some very elaborate letters concerning the matter, the writers of which are well known for their many contributions to the Journal; but, strange to observe, each one holds widely different opinions.

Mr. Edwin B. Vizer's letter occupies a good space, but I must frankly remark that it seems more eloquent than logical; and in my opinion, his views, instead of leading to anything of service, are most inconsistent, or, if I might use a political phrase, they are perhaps ultra-radical.

I do not wish to review his letter as a critic would do, but what I wish to point out is the error he labours under in desiring to take up so much of the Journal in putting forth ideas that are not at all compatible with the subject.

He says, "Allow me to put a parallel case, and to ask what would be the feeling of a gentleman after receiving a good education, walking the hospital, going through the usual examination, and who in due course received his diploma authorizing him to practise, were the same authorizing body to come to him and say, 'Now, Sir, you have passed our examinations, you are fully qualified to practise, but before you do so, we must remind you that you must conform to our regulations as to the place and manner of keeping your knives and lancets, lest you should by mistake use the wrong one. You must also have each of these instruments distinctly engraved "dangerous," lest you should by chance forget the fact.'" I glean from this that Mr. Vizer does not deem it expedient that any act or rule is necessary to guide or control those who pass an examination, and, if he had the ruling, he would annihilate it *in toto.* But he must either forget, or he has not been aware, that all who keep open shops for the dispensing and compounding of medicines, are unfortunately not individuals of his ability and qualifications.

Many indeed, although registered as dispensing chemists, have never passed examinations, and I presume this is one of the special reasons which actuate the Council in urging the necessity of a law, to act as a preventive, as far as possible, of the deplorable accidents which have so frequently happened, and which must necessarily raise the indignation of the public against pharmacists in general.

How Mr. Vizer can offer the keeping of a surgeon's knives or lancets as a parallel case with that of storing virulent poisons seems to me ridiculously absurd. I cannot perceive any similarity whatever. If the surgeon should use the wrong knife or lancet, in all probability the harm would be but little; but if the pharmacist should use the wrong powder, such as strychnine for sugar, the mischief is irreparable. The majority of the trade, too, will admit, I think, that there cannot be a doubt as to the actual necessity of an Act for the storing and safe keeping of poisons. I know there is a sort of jealousy entertained by some parties, as this Act does not apply to surgeons, but why should such envy exist? Surgeons are not ruled by the Pharmaceutical Society. They have an Act of their own to practise under, and they consider themselves quite apart from the pharmacist. It also must be borne in mind that the surgery is quite a different kind of place to the pharmaceutical establishment. We may find two or three poisons in the former, while in the latter we have (or should have) all that the "Materia Medica," or Pharmacopœia, contains. Besides, the dispensing in the private surgery is totally different from that of the pharmaceutical establishment.

Therefore, as to having an Act for keeping and storing of poisons, I emphatically say it is necessary. I feel confident, too, that if something is definitely fixed upon, the change will benefit the whole trade. I might add that, as far as I can perceive, the law now in use has raised us considerably in the estimation of the public, for when they are assured that we have such precautions they feel a perfect safety in receiving medicines dispensed by us.

The present arrangement of keeping poisons in a separate apartment or cupboard is, no doubt, to a great extent, a satisfactory precaution; but it must have an improvement, as the dangers are equally bad as, if not worse than, that of mixing them with the usual drugs.

We have had several suggestions on this point. A very useful and practical one came from Mr. Proctor. He recommended "that all poisons intended for internal use as medicines, the usual adult dose of which is less than one drachm, shall bear a label immediately under the name of the article, stating the usual adult dose; and upon such articles the usual adult dose of which is less than, say 5 grains, there shall be added the label 'Poison!' immediately under the label indicating the dose." He also suggests, "that if a poison-cupboard or other additional precaution be deemed necessary, it should only apply to such poisons the adult dose of which does not exceed 5 grains, thus liberating the tincture and wine of opium, etc., from the poison-cupboard, and liberating paregoric elixir and syrup of poppies from any restriction regarding their storage."

In the many suggestions we have had, this seems to be the one that is the most useful, and the one which should be specially laid before the Council for their consideration at the next discussion on this very important subject.

What can be a safer guide to the dispenser, than to have the bottle distinctly labelled with the dose, and the word "poison" placed as prominently as suggested by him?

The doses of medicines are very apt to escape the memory of the most careful; but having it constantly before him is of the utmost importance. He knows then that the quantity he puts in a mixture is safe.

To this very useful suggestion I would wish to add another. In the keeping of the cupboard, one very necessary thing ought to be attended to, that is, the bottles which contain powders of a similar appearance, ought to be of a different character. For instance, strychnine, morphia and emetic tartar, ought to be more conspicuous than those less dangerous. The same rule should also apply to liquids; Scheele's hydrocyanic acid ought to be in a different-coloured bottle from that of the acid of the B. P. strength.

To arrive at some definite result respecting this most important and very necessary Act, we must put aside antagonism and petty prejudices, and ask ourselves whether the rules are so very troublesome that we cannot carry them out. We must do our utmost to assist the Council as much as possible, and let us bear in mind that they are a body of practical and intelligent men, anxious to promote our welfare and raise us to something higher than we have hitherto been. I had commenced this letter early last week, with the intention of submitting it to you for insertion in last week's Journal, but Christmas festivities interfered with my finishing it. I trust, however, it is not too late to point out to Mr. Vizer the mistake he has made.

January 3rd, 1871. JOHN DOWLING ALLMAN.

INFUSIONS.

Sir,—I have only now seen Mr. Allchin's paper on Infusions, which appeared in your Journal of the 17th inst. I hope you will allow me space for a few words on this subject, and they shall be as few as possible, for the matter lies (as I conceive) in a nutshell.

It seems to be generally agreed by several writers on the subject in your Journal, that fresh infusions are to be preferred to those of a concentrated form. I think if this be conceded, it can only be when those infusions really are made fresh daily; at least, one can only be sure of it then. I know very well what frequently happens when freshly made infusions are bottled and put on one side till they are wanted. They may be, and no doubt are, very good sometimes, when wanted a day or two afterwards; but I know they are very often kept in that way too long, and sometimes until they are unfit for use, and there is so great a temptation to use them (no concentrated infusion, perhaps, being at hand) when they are, at all events, in a partly decomposed state. Surely a carefully prepared concentrated infusion must be better than that.

I know it is all very well in theory to talk of using none but freshly-made infusions, but it cannot always be, save in houses doing a large dispensing business. They can and they do, no doubt, make those fresh infusions every morning which are likely to be wanted during the day, and their large daily consumption of such warrants them and repays them for so doing; but chemists in general cannot do this. It would be a great loss to them were they to make fresh infusions daily and throw away those not used, and so in self-defence they must use concentrated infusions. I say in self-defence, and thus it is so. A person, for instance, takes a prescription to one of the large dispensing houses, and has a mixture made up containing some ordinary infusion. The mixture is made at once, and the customer takes it away with him. Some day, when again wanting that mixture, he takes the prescription to some other chemist, who tells him it will take an hour or so to prepare. The customer is, of course, very much surprised, and probably all the explanation in the world will fail to convince him but that this chemist is "a muff," and though he may consent to have his mixture made there then, he determines not to go to that shop again. So it is to meet this, or rather to prevent this, chemists, not doing a dispensing business which will warrant them in keeping fresh infusions ready, must use concentrated infusions to enable them to compete with the larger houses.

There can be no doubt, I think, that infusions can be so prepared as to contain all the extractive matter of the material employed in a concentrated form. Medical practitioners as a rule use them in the concentrated form, and find them answer admirably; and if vegetable extracts are to be believed in at all, I cannot see why they should be prescribed without hesitation in pills, etc., and a concentrated infusion, which is, of course, not nearly so concentrated a preparation as an extract, should be objected to. For my own part I believe the best plan would be to recognize concentrated infusions at once in our Pharmacopœia. They are partially so, I know, by the introduction of the formulæ for ext. cinchonæ liq., ext. Pareiræ liq., etc., but I venture to think if concentrated infusions generally were recognized there, it would put an end to much uncertainty in the matter; it would lead to more uniformity in dispensing, and it would, on the whole, be more satisfactory alike to the prescriber, to the dispenser and to the patient.

HENRY AYSCOUGH THOMPSON.

22, *Worship St., Finsbury Sq., London, E.C.*
27th December, 1870.

PRESCRIBING AND DISPENSING.

Sir,—I presume the time is approaching when medical men will no more be their own dispensers than architects their own builders. The anomalous position of prescribers and pharmacists is doomed, but good service may yet be done in clearing the way.

Are medical men gainers by dispensing? I doubt it much. Dispensing implies a stock of medicine and implements, the value of which is money sunk;—it often implies the salary of an assistant; it always implies employment inconsistent with the duties of a prescriber. Again, it deprives medical men of the support of pharmacists, and gives them opposing interests. Who loses most by this false position? Surely prescribers. Medical men can doubtless do much for chemists, but chemists can do more for medical men. What chemist, possessing in any degree the confidence of the public, does not know that scarcely a day passes when he could not transfer an applicant to the doctor? Make it his interest to do so,—or rather make it unfair that he should do otherwise —and the desired revolution would soon be effected. The practice arising from this altogether new class of patients would more than compensate prescribers for loss of profit on medicine.

These things will doubtless for some time be said and resaid with more or less force before all that is included in the new position of pharmacy, as a recognized and legalized branch of the medical profession, is understood and appreciated. A slow crystallization is however going on, which will gradually assign to the treaters of disease and the preparers of remedies their due form and position. When the process shall have been completed, the substantial benefits of the change, to both parties, will be too apparent to leave an atom of regret for the "good old times" that will have come to an end. T. M.

Glastonbury.

A POINT OF ETHICS.

Sir,—The only way to settle the matter in dispute relative to the prescription dispensed by "Magnesia" would be for him to ask the medical man if he intended to add "ac. sulph. dil." to the mixture. In all my experience in different towns, extending over thirty-six years, I never knew a doctor "but one" to order quinine in a mixture without adding a *little* ac. sulph. dil., "or other acids," to dissolve it, excepting in the case of "inf. rosæ c. quina" or "pills." *D. T. W.* will be kind enough to remember that he charged me with wishing to make the medical men appear more forgetful than they are, therefore I gave him the *two* prescriptions to inspect, and those "not solitary cases."

Liverpool, Dec. 31st, 1870. CHEMICUS.

LISTS OF DRUGS.

Sir,—If any of your readers, especially among wholesale druggists, could furnish me with two or three *stock-books*,—I mean manuscript-priced inventories of drugs,—dating from the early part of the present century, say 1800 to 1825, I should feel much indebted to them. I have some lists of the previous century.

Clapham Common, S.W., 4th January. DANIEL HANBURY.

DISPENSING CHARGES.

Sir,—I had the following prescription brought me this afternoon to dispense. It was marked on the side thus:—

℞.	Tinct. Camph. Comp.,	2
	Syr. Scillæ, ana ℥ss	1
	Acid. Sulph. Dil. ʒiij	1
	Tinct. Digitalis ʒj	1
		—
	Aquæ ℥viss	5

A tablespoonful thrice a day.

As it was for a working man, I thought I would be very reasonable in my charge, and only asked 1*s*. He told me he could get it made up in Newcastle for 5*d*. I refused to make it for that money, so he paid the shilling, but most likely will go to the "cheap man" next time.

Chester-le-Street, Dec. 28th, 1870. A. P. S.

MAG. FERRI ET QUIN. SULPH.

Sir,—My intention in writing to your Journal was to obtain information, and certainly not to annoy Messrs. Hitchcocks. In explanation I will state the facts.

The porter of a chemist brought the prescription, and asked for the article, which he said he was told was kept here (Apothecaries' Hall, Blackfriars). Hence the mistake. I did not go to Bruton Street, nor did I send any one else; but the same prescription has been brought to me by another chemist, also with a request for the article, within the last few days.

I am obliged to *G. S.* for the formula for the drug, which I am since informed was to be seen in a late number of the *Lancet.*

December 31st, 1870. E. B.

Fox's Palatable Oils.—Messrs. Fox, in the letter that they have forwarded, express their opinion that the "Liverpool Chemists' Association has stepped beyond its province, and made remarks without regard to their accuracy and without a sufficient knowledge of the matter they were handling." They dispute the remarks made by the President at the meeting on the 8th December, and add that, since they depend more particularly upon the medical profession to recommend their preparations, they had only sent to medical men the circulars stating what proportion of oil was contained in those preparations. They also state that they hold two patents for these preparations, and that they consider the decided separation of the oil from the other ingredients as a recommendation, inasmuch as it enables medical men to perceive with ease the actual amount of oil. They prefer that their preparations should be in this respect excluded from what is termed "elegant" pharmacy.

Inquirer.—No.

S. N. (Dorchester).—Colenso's Arithmetic.

Nemo.—Consult the papers on Liquor Taraxaci, by Bentley (PHARM. JOURN. 2nd ser. i. 402) and Squire (Brande's 'Materia Medica'). The difference in the appearance of the specimens is probably due to their having been prepared at different seasons of the year. We should prefer the darker for dispensing purposes.

D. D.—We think our correspondent might perhaps obtain a better result by using a calico filter instead of a paper one.

"*Guaco.*"—The iodine will be in a free state. The alkalies present are not in a condition to combine with it. The plants mentioned contain sulphur.

"*Vindex.*"—We do not think that formulæ for proprietary medicines are to be obtained through the medium of the Notes and Queries columns.

J. E. (Cromer).—The following is the formula for a syrup of lactate of iron proposed by M. Cap:—

℞. Lactate of Iron, 1 drm.
White Sugar, 12½ oz.
Boiling Distilled Water, 6½ fl. oz.

Rub the salt to powder with half an ounce of the sugar, and dissolve the mixture quickly in the boiling water. Pour the solution into a matrass placed on a sand-bath, and add to it the rest of the sugar in small pieces. When the sugar is dissolved, filter the syrup, and as soon as cold transfer it to well-stoppered bottles. This syrup has a very light amber colour, and contains about four grains of the salt to the fluid ounce. Dose from two to four fluid drachms.

J. T. Greenwood (Louth).—Distil a known quantity with caustic lime and as much water as may be necessary, collecting the distillate by careful condensation; then determine the ammonia by titration with a standard acid, or by adding a slight excess of hydrochloric acid, and evaporating to dryness, so as to weigh the chloride of ammonium.

John Gregory (Stockton-on-Tees).—The indications afforded by the tests you refer to are scarcely to be relied upon unless the operator has a large empirical familiarity with the results produced under various conditions. Probably the oil referred to was mixed with some substance that resinified on exposure to the atmosphere. This admixture might be accidental or otherwise, and in either case the presence of a very small amount of such substance might be sufficient to give rise to the rose tint observed,—so that this result could not *alone* be relied upon as indicating inferiority or adulteration of the sample in question.

"*Anxietas.*"—We have given full consideration to your suggestion, but we do not regard this Journal as the proper medium for giving such educational aid as that referred to. Moreover, the plan proposed is so admirably carried out in another journal, that we should be in no small degree poaching upon its preserves, if we were to adopt the same course. At the same time, we are much obliged for the suggestion, and will take this opportunity of saying that we should be very glad if members of the trade would more generally communicate their opinions and wishes in regard to such matters as it is the province of this Journal to deal with. In many cases that would be a means of rendering good service to the general interests of pharmacy and of our Society.

"*Inquirer.*"—We cannot furnish you with the address asked for.

"*Veritas.*"—We are unable to give the information concerning the proprietary medicine referred to.

A Student (Harwich).—See PHARM. JOURN. o. s. Vol. XII. for full information on the subject.

W. A. Thirlby.—In order to promote oxidation and facilitate solution of the iron.

C. J. Cann (Greenwich).—Prussiate of potash is exempt from being included in the words "cyanide of potassium and all metallic cyanides," partly because it is not a cyanide but a *ferrocyanide*, chiefly, however, because it is, as a matter of fact, not a poisonous substance.

J. B. Leslie (Sheffield) who expresses his dissent from our Answers to Correspondents in No. 19 and 20, will find in the foregoing answer a solution of his difficulty.

G. Wellborn.—(1.) See Ure's 'Dictionary,' art. "Yeast, Artificial." (2.) The rise of temperature, in the one case, and the fall of temperature in the other, are due respectively to the facts that heat is evolved in the one case, while it is rendered latent in the other. In the former case there is reason to believe that something like chemical combination takes place, resulting in the production of a hydrated salt, while in the latter case the change is merely physical, or the heat rendered latent in the liquefaction of the salt exceeds in amount any heat that may be evolved as a result of chemical combination between the salt and water.

S. D.—Hooper's 'Medical Dictionary' and Mayne's 'Medical Vocabulary' (Churchills).

COMMUNICATIONS, LETTERS, etc., have been received from Mr. A. H. Hale (Ramsgate), Mr. H. B. Brady (Newcastle), Mr. C. R. C. Tichborne (Dublin), P. L. Simmonds, A Stranger, "A. P. S.," "M. P. S."

"ANDREW BOORDE, of Physyche Doctor."

In all Mr. Ince's 'Century of Old Books,'—we speak with reservation, in that we are only partially acquainted even with their titles as yet,—there may possibly not be found one more edifying and amusing than a volume recently issued by the Early English Text Society, containing a reprint of some of the principal works of Dr. Andrew Boorde.* But apart from general interest or antiquarian value, this book has a peculiar claim on the notice of those to whom familiarity with medicines and dietary in the nineteenth century affords common meeting ground with an exponent of the theory and practice of the sixteenth in the same particulars.

Of Andrew Boorde himself not much is known. Some of our readers may perhaps not even recognize his name, others probably will know nothing more than the ill-natured tradition that he was a court physician in Henry the Eighth's time, in whose wandering habits and strange modes of pursuing his avocation the word "Merry Andrew," as applied to the odd being, half mountebank half quack doctor, still sometimes seen at a country fair, had its origin. Mr. Furnivall tells us something more, but not half as much as we should like to know.

We gather from the summary prefacing the reprints, that he was born some time before the year 1490, that he was brought up at Oxford, and admitted, whilst still under age, as a Carthusian monk. He appears to have been "dispensed" of his vows in 1521, in order to be made Suffragan Bishop of Chichester, and to have made use of his liberation by going abroad to study medicine. During succeeding years he made several foreign pilgrimages, extending his travels much further than was common in those days, (to all the universities and approved schools within the precinct of Christendom, he himself says,) and in 1536 we find him practising and studying medicine at Glasgow. After his last Continental tour Boorde settled at Winchester, and probably spent the remainder of his days partly in that city, where he had amassed some property, and partly in London. His end could hardly have been a happy one. Accused by his enemies of immorality, he was imprisoned in the Fleet, and the last information we have concerning him is found in his will, dated from his place of confinement, April 25, 1549.

Mr. Furnivall's first quotations are from the 'Breuyary.' Their phraseology is delightfully quaint, and they serve to give us an idea both of Boorde's theories as to the origin of various distempers and his actual practice as a physician. The specimens selected by the editor generally refer to psychological disorders, and the treatment in these cases is based upon hygiene rather than medicine. Still there are a number of sections devoted to material ills, such as itch, palsy, asthma, stone, chilblains, excoriations, and sundry cutaneous affections, of which the following may be taken as a specimen:—

Boorde's treatment of Itch:—A good pair of Nails.

"¶ The .292. Chapitre doth shewe of Itchynge. *Prurigo* is the latin word. In Englyshe it is named itching of a mans body, skyn, or fleshe,

¶ The cause of this impedimente.

¶ This impediment doth come of corrupcion of euyll bloud, the which wolde be out of the fleshe; it may also come of fleume myxt with corrupt bloud, the which doth putrifie the fleshe and so consequently the skyn.

☞ A remedy.

This I do aduertise euery man for this matter to ordeyne or prepare a good payre of nayles to crache and clawe and to rent & teare the skynne and the fleshe, that the corrupt bloud maye runne out of the fleshe; and vse than purgacions and stuphes & sweates; and beware, reuerberate not the cause inwarde with no oyntment, nor clawe not the skyn with fyshye fyngers, but washe the handes to bedwarde."—P. 97.

Or the following:—

Boorde's treatment of Palsy.

"☞ Fyrst, vse a good dyet, and eate no contagious meates; and yf nede be vse clysters, and anoynt the body with the oyles of Laury and Camomyll; but whether the Palsy be vniuersal or perticuler, I do anoynte the body with the oyle of Turpentine compounde with Aqua Vite, and vse frications or rubbynges with the handes, as one wolde rub with grece an olde payre of Botes, not hurtynge the skyn nor the pacient. And I do gyue the pacient Treacle with the pouder of Peper or els Mitridatum with Peper; or els take of Diatriapiperion. And if one wyll, he may rub the pacient with the rotes of Lylyes, brayed or stamped; after that use dry stuphes as the pacient is able to abyde. Or els, take a Foxe, with the skynne and all the body quartered, and with the herte, lyuer and lunges, and the fatnes of the intrayles, stones and kidnes, sethe it longe in runnynge water with Calamynt and Balme and Carawayes, and bath the pacient in the water of it; and the smell of a Foxe is good for the Palsy."—P. 99.

He does not approve of sending for the "duly qualified medical man" for small ailments, but trusts much to nature. For instance, speaking of some affection of the eyes, he says,—

"I myght here shewe of many salubriouse medecines, but the best medecine that I knowe is to lette the matter alone, and medle nat with it, but were before the eyes a pece of blacke sarcenet and eate neyther garlycke nor onyons nor drynke no wynes nor stronge ale, and it will were away."—P. 101.

He has, nevertheless, a genuine belief in physic properly administered, and his prescriptions often show a definiteness of purpose which, if we may judge by samples we have recently had to print in our pages, the modern prescriber might at times imitate with advantage.

The 'First Boke of the Introduction of Knowledge' hardly concerns us, and though highly entertaining, we must pass it by with the editor's remark, that "It is the original of Murray's and all other

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* The First Boke of the INTRODUCTION OF KNOWLEDGE made by ANDREW BORDE of Physyche Doctor (1547).—A Compendyous Regyment or A DYETARY OF HELTH made in Mountpyllier, compyled by ANDREWE BOORDE of Physyche Doctour (1542).—BARNES in the DEFENCE OF THE BERDE: a Treatyse made, answerynge the Treatyse of Doctor Borde upon Berdes (1542 or 3).

Edited, with a Life of Andrew Boorde and large Extracts from his Breuyary, by F. J. Furnivall, M.A., Trin. Hall, Camb.

LONDON: Published for the Early English Text Society, N. Trübner and Co. 1870.

English Handbooks of Europe." A good deal of it is in verse, and it seeks to inform its readers on matters of Continental travel, with some foreshadowing even of the polyglot phrases of the modern tourist's guide.

The "Dyetary of Helth" is a complete system of regimen, not only as its title would impart, for people already sound in body, but for those afflicted with disorders of divers sorts. It begins by directing how and where a man should build his house; how order his household so as to live in quietness; how the head of a house should exercise himself for the health of his soul and body; and how order himself in sleeping, in watching and in apparel. Surfeiting is shown to do much harm to nature, but "abstynence is the chyfest medyson of all medysons." A number of chapters are devoted to the consideration of the virtues of various forms of diet, whether meat or drink, and many of the conclusions would startle the modern physiological chemist; then follow dissertations on roots, herbs, fruits and spices. We quote the following as a contribution to therapeutics:—

"Pennyryall doth purge melancoly and doth comforte the stomacke & the spyrites of man. Isope (hyssop) clenseth viscus fleume, & is good for the breste and for the lunges. Roosmary is good for palses, and for the fallynge syckenes, and for the cowghe, and good agaynst colde. Roses be a cordyall, and doth comforte the herte & the brayne."

The diet of men should differ according to their temperaments, the sanguine, the phlegmatic, the choleric, and the melancholy, will each find a chapter for his guidance. In times of epidemics and pestilence an additional precaution is needed in the form of fumigation, and a formula for a sort of incense is given. Then follow the diets for gouty and leprous patients, for the stone, colic, fever, dropsy, ague, and the like. And lastly,

"The xl. Chapytre doth shewe an order or a fasshyon how a sycke man shulde be ordered, And how a sycke man shuld be vsed that is lykely to dye."

We would gladly dwell on the curious glimpse this book affords us of the practice of medicine in the time of the Tudors. In Mr. Furnivall's estimate of his author every thoughtful student will concur. "I think," says he, "the reader will find Andrew Boorde worth knowing, a man at times of great seriousness and earnestness, yet withal of a pleasant humour; reproving his countrymen's vices and ridiculing their follies; exhorting them to prepare for their latter end and yet to enliven their present days by honest mirth. A man eager to search out and know the truth of things, restless in that search, wandering far and often to see for himself. Yet a man bound by many superstitions of the time, though free from many. * * * Sound at the core, a pleasant companion in many of England's most memorable days, worthy, with all his faults, of respect and regard from our Victorian time." But our space at present permits no more than to thank Mr. Furnivall and the Early English Text Society for the results of their labour, and to bestow a passing word of admiration upon Mr. W. H. Hooper's masterly reproductions of the droll wood-cuts that adorned the original works.

H. B. Brady.

METHYLATED SPIRIT.

BY P. L. SIMMONDS.

It is curious to trace the progress that has been made in the use of methylated spirit since it was first introduced about fifteen or sixteen years ago, as given in the detailed reports of the Commissioners of Inland Revenue. The high price of duty-paid spirit in this country not only repressed scientific research, but seriously interfered with trade, by compelling manufacturers to resort to cheaper and inferior substitutes for spirits, which injured the character of the goods, and, in some instances, made it doubtful whether the manufacturers in this country could much longer compete with those on the Continent, where the duty on spirit is inconsiderable.

In the year 1853, a gentleman who had obtained a patent for an artificial lubricant as a substitute for sperm oil, applied to the Lords of the Treasury to be allowed to use spirit in the manufacture of his lubricant, duty free, or at least at a reduced rate. After a careful examination of his invention, it was found that the spirit was rendered unfit for drinking, and that it could not by any process be restored to its original purity. A mixture of 10 per cent. of purified wood naphtha with spirit of wine effects the object. An Act was consequently passed in 1855 allowing such a mixture to be used duty free. Although there was good reason to believe that the methylated spirit would be so unpalatable that it would effectually repel ordinary drinkers, yet as it was not, in a peculiar degree, pernicious to health, it was impossible to predict what might be the result if such a means of intoxication at a cheap rate were readily accessible to habitual drunkards. It was, therefore, deemed necessary to impose such conditions on the use of methylated spirit as would guard against its possible perversion to purposes for which it was not intended. Persons who wished to use this spirit were required to make a written application to the Board, and to engage under bond that it should be properly applied. They were then furnished with forms of requisition, by means of which they could at pleasure obtain such quantities as they might require, not being less than ten gallons at a time. These regulations still apply in cases in which the spirit is required to be used in quantities greater than can be met by supplies not exceeding one gallon at a time, but by Act 31 & 32 Vict. c. 124, the minimum quantity that may be supplied at one time is reduced to 5 gallons.

The following are the principal purposes to which the spirit was at first applied:—Making furniture polish, varnishes and lacquers; dissolving resins for hat manufacturers; manufacturing hypospem oil, chloroform, sulphuric, nitric and chloric ethers, sweet spirit of nitre, fulminating powder and transparent soaps; extracting vegetable alkaloids, such as quinine, morphine, etc.; making soap liniment and extracts required in veterinary medicines; preparing gold-beaters' skin, floating mariners' compasses and filling spirit-levels; preserving objects of natural history, and in chemical and anatomical researches.

It was not at first allowed to be adopted as a source of heat or light for domestic purposes. In order, however, to accommodate a large class of work-people, known as French polishers, the spirit was permitted to be sold in smaller quantities than those prescribed by the Act, on condition that a certain proportion of shellac or other resin was dissolved in it, so as to make the preparation which is technically termed "polish," from its being employed to complete the polishing of the goods. There cannot be a doubt that this measure has been very beneficial in its operation.

Besides the direct encouragement which it has given to scientific research and to manufacturing industry, it has materially lessened the demoralizing practice of illicit distillation which was carried on (in London at least) principally for the supply of persons who use spirits as a solvent for gum resins, or in the manufacture of ethers or spirits of nitre.

In 1861, sufficient experience having been gained to warrant the conclusion that there was no danger of the preparation being converted into a beverage, some of the restrictions on its sale and use were removed. In July of that year an Act was passed which enabled any one (other than persons dealing in excisable liquors) to obtain a licence for retailing methylated spirit in quantities not exceeding one gallon at a time, and removing, in respect to the small quantities sold under such licence, the restrictions which confined its use to the various processes connected with the arts and manufactures.

It may now be purchased in small quantities for domestic use, and is largely consumed in a great variety of appliances to luxury and comfort, from the spirit lamp on the breakfast table to the singeing apparatus in the stable. The duty on the retail licence which was first fixed at £2. 2*s.*, was in 1867 (by the 30 & 31 Vict. c. 90) reduced to 10*s.*

Methylated spirit has found an extensive application in the preparation of the brilliant new dyes which were introduced about ten years ago. The French had long been in the habit of using alcohol in dyeing, but the high duty on spirit in this country formerly acted as a complete prohibition of their use for this purpose, and enabled the French to maintain an undoubted superiority.

In 1863 the high price of turpentine, caused by the war in America, led to an attempt to use rum as a substitute for it in paint. As it was represented that the methylation of rum for that purpose would be a great boon to the West Indian colonies, by affording an outlet to inferior produce, which was scarcely saleable as beverage, the authority of Parliament was obtained for allowing the mixture of rum in bonded warehouses with wood naphtha. The expectation of its utility as a substitute was not realized. The same Act legalized the exportation of methylated spirit.

Up to the year 1866 the consumption of methylated spirit had, by an almost regular progression, continued to increase, rising from 218,103 gallons in 1856 to 1,070,897 gallons in 1865. The fraudulent practice of making a compound of methylated spirit, which under the pretence of being used as a medicine, was in reality sold as a stimulant in the place of ordinary spirits, although not extensively prevailing, had, in 1866, become an increasing practice, and from every point of view, it appeared most desirable that it should be suppressed. It was also intimately connected with the application of methylated spirit to purposes for which it was never intended, though not expressly prohibited, namely, the preparation of tinctures and of medicines for internal use, an application of that spirit which the Pharmaceutical Society considered highly objectionable.

It was therefore necessary to resort to legislation, and to prohibit entirely the use of methylated spirit in any preparation which could be used internally as a medicine. Sulphuric ether and chloroform, on account of their being used extensively in arts and manufactures, were excepted from the prohibition above specified. Methylated spirit may also still be employed as a solvent or agent in the production of medicines, provided no spirit or derivative thereof shall remain after the completion of the process. In addition to this prohibition, it has been found advisable to impose a legal restraint upon any alteration in the character of the compound known as "finish," except by the introduction of more resin or colouring matter.

The object is to prevent "finish," which may be procured in unlimited quantity by the general public without certificate or a compliance with any forms, being applied to other than its legitimate purposes, that of a polish for furniture.

Attempts have at times been made to purify and render drinkable the methylated spirit, but apparently without success. The presence of the required portion of gum-resin in finish was considered to be a sufficient safeguard to the revenue, but there is no doubt that large quantities of finish were turned to improper account, either by covering the nauseous flavour with aromatics or by distillation with acids, which effected a conversion into potable ethers.

As an additional security to the revenue therefore, as well as to ensure the using of the finish for none but the approved purposes in the arts, a provision in the law was made to the preceding effect. This legislation has checked consumption to a considerable extent, by confining it to legitimate purposes. In the year ending March 1866, 1,070,897 gallons were used; 1867, 1,031,214; 1868, 854,844; 1869, 885,957. This decline probably represents the extent to which this spirit was applied either to fraudulent purposes, or to those such as the preparation of medicines for internal use to which its application was undesirable.

The increase in the last year may be fairly considered as representing the natural growth of a legitimate consumption. The number of licences granted to makers in 1869 was only 6 in England, 2 in Scotland, and 1 in Ireland. The retailers who had licences, however, numbered 991 in England, 148 in Scotland, and 41 in Ireland.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Cadmii Iodidum.—[§ It may be formed by direct combination of iodine and cadmium in the presence of water.] Cadmium is a metal which accompanies zinc in its ores, and resembles it in many respects very closely, but is more volatile. It is also distinguished by giving a yellow sulphide when sulphuretted hydrogen is passed into any of its acid solutions, and this yellow precipitate is not soluble in sulphide of ammonium. The latter character separates it from the sulphide of arsenic, which is of a similar colour. [§ Iodide of cadmium, in addition to the preceding reactions, gives a white gelatinous precipitate with excess of solution of potash, the filtrate from which is unaffected by sulphide of ammonium.] If any zinc compound were present the filtrate would retain it, and would give white sulphide of zinc on the addition of sulphide of ammonium. [§ Ten grains dissolved in water and nitrate of silver added in excess, give a precipitate which, when washed with water and afterwards with half an ounce of solution of ammonia and dried, weighs 12·5 grains.] The precipitate is, of course, iodide of silver, and the object of washing it with ammonia is to remove adhering traces of the cadmium salt. It should be remembered that the precipitate is not absolutely insoluble in ammonia. Since CdI_2 is the formula of iodide of cadmium, it will yield 2 molecules of AgI. 366 parts of iodide of cadmium give then 470 parts of iodide of silver; 10 grains will therefore yield, theoretically, 12·84 grains.

Calcii Chloridum.—[§ It may be formed by neutralizing hydrochloric acid with carbonate of lime, adding a little solution of chlorinated lime and slaked lime to the solution, filtering, evaporating until it becomes solid, and finally drying the salt at about 400°.]

The object of this process is to remove from the salt ferric oxide and alumina, which are very commonly present. When thus prepared, the product answers to the Pharmacopœia test. [§ The aqueous solution is not precipitated by the addition of limewater.]

Calcis Carbonas præcipitata.—Solutions of chloride of calcium and carbonate of soda are mixed together, the precipitate collected, well washed and dried at 212°:—

$$CaCl_2 + Na_2CO_3 = Ca\,CO_3 + 2\,NaCl.$$

See *Creta Præparata.*

Calcis Hydras.—The operation of slaking lime is familiar to every one. In operating upon small quantities hot water is best. Slaked lime should not be exposed to the air for any length of time, as it absorbs carbonic anhydride, becoming converted into carbonate.

Very pure lime, free from the alumina, iron, silica and alkaline chlorides commonly present in the ordinary kind, is now prepared commercially from marble, and can be procured at a cheap rate.

Calcis Phosphas.—Bone ash is digested in diluted hydrochloric acid, and the filtered liquid mixed with solution of ammonia in slight excess. The precipitated phosphate is to be thoroughly washed with hot water. Bone ash is composed of:—

Tricalcic phosphate . . .	$Ca_3 2PO_4$	
Monocalcic phosphate . .	$CaHPO_4$	
Calcic carbonate	$CaCO_3$	
Magnesic phosphate . .	$MgHPO_4$	traces.
Calcic fluoride	CaF_2.	traces.

Mixed with particles of carbonaceous matter. When treated with hydrochloric acid, all dissolve except the particles of carbon and sandy matters that are generally present. On filtering the solution and adding ammonia, the chloride of calcium, which was formed by the solution of the carbonate, supplies calcium to the monocalcic phosphate, and thus a precipitate, composed chiefly of $Ca_3 2PO_4$, is produced. For detection of phosphate of lime, see Bism. Subnitras.

Calx.—See Calcis Hydras.

Calx Chlorata.—[§ A product obtained by exposing slaked lime to the action of chlorine gas as long as the latter is absorbed. It possesses bleaching and disinfecting properties.] This compound is very commonly represented as a mixture of hypochlorite and chloride of calcium—

$$2\,CaO + 2\,Cl_2 = \underset{\text{Hypochlorite.}}{Ca\,2\,ClO} + \underset{\text{Chloride.}}{Ca\,Cl_2}.$$

Many of its characters, however, indicate that this view cannot be correct. Thus, it is not so soluble in water as it should be on such a supposition; it is not particularly deliquescent, and yields but a small amount of chloride of calcium when treated with spirit. It is more probably a compound intermediate between the chloride and hypochlorite, the constitution of which may be represented by the following formulæ:—

$$\underset{\substack{\text{Chloride}\\ \text{of Calcium.}}}{Ca''\begin{cases}Cl\\Cl\end{cases}} \qquad \underset{\substack{\text{Calx}\\ \text{Chlorata.}}}{Ca''\begin{cases}Cl\\(ClO)'\end{cases}} \qquad \underset{\substack{\text{Hypochlorite}\\ \text{of Calcium.}}}{Ca''\begin{cases}(ClO)'\\(ClO)'\end{cases}}$$

[§ The solution evolves chlorine copiously upon the addition of oxalic acid, and deposits at the same time oxalate of lime.]

$$CaClClO + H_2C_2O_4 = CaC_2O_4 + H_2O + Cl_2.$$

[§ 1 gram mixed with 3 grams of iodide of potassium, and dissolved in 4 fluid ounces of water, produces, when acidulated with 2 fluid drams of hydrochloric acid, a reddish solution, which requires for the discharge of its colour at least 85 cubic centimetres of the volumetric solution of hyposulphite of soda, corresponding to 30 per cent. of chlorine liberated by the hydrochloric acid.] The action of the hydrochloric acid on the chlorinated lime is this:—

$$Ca\,ClClO + 2\,HCl = Ca\,Cl_2 + H_2O + Cl_2,$$

and each atom of chlorine thus produced liberates an atom of iodine from the iodide of potassium. When that salt is present, therefore, in sufficient quantity, part of it is decomposed, and not chlorine, but iodine, is set free—

$$Ca\,ClClO + 2\,HCl + 2\,KI$$
$$= Ca\,Cl_2 + H_2O + 2\,KCl + I_2.$$

The amount of iodine is then determined by the employment of the solution of hyposulphite of soda. This is made by dissolving 1 molecule (248 grams) of the crystallized salt in water, and making the solution measure 10,000 cubic centimetres. This quantity would therefore be sufficient to decolorize 1 atom, or 127 grams, of iodine.

$$\underset{\text{Hyposulphite.}}{2\,Na_2S_2O_3\,5\,H_2O} + \underset{\text{Iodine.}}{I_2}$$
$$= \underset{\text{Iodide.}}{2\,NaI} + \underset{\substack{\text{Tetrathionate}\\ \text{of Sodium.}}}{Na_2S_4O_6} + 5\,H_2O.$$

If 85 cubic centimetres are necessary to decolorize the iodine set free by 1 gram of the calx chlorata, this indicates 1·0795 gram of iodine, and consequently an equivalent quantity, or ·30175 of Cl,—

10,000 : 85 : : 35·5 grams of chlorine,

equivalent to 127 grams of iodine: ·30175 gram, the chlorine available from 1 gram of calx chlorata.

Since 1 gram yields ·30175 of Cl, 100 grams yield 30·175. This is the same as saying 30 per cent.

THE EXTRACTION OF THE POISONOUS PRINCIPLE OF THE TUTU PLANT (CORIARIA RUSCIFOLIA).

BY W. SKEY,

Analyst to the Geological Survey of New Zealand.

A great many experiments have, from time to time, been made upon the Tutu plant, with the object of extracting the formidable poison known by sad experience to exist therein; but, as is well known, these attempts have been always unsuccessful, and have, besides, completely failed to discover anything at all definite as to the chemical or physical character of the poison.

Among these experiments is a series I made while connected with the Geological Survey Department of Otago, a notice of which appeared in the "Jurors' Report for the New Zealand Exhibition of 1865," the only result, however, being to prepare the way for future inquiry, which was promised at the time.

The Tutu plant does not grow in the neighbourhood of Wellington in any quantity, hence I have been greatly delayed in fulfilling my promise, much against my will; but recently a large quantity of the seed of this plant has been kindly presented to the Survey, for this particular purpose, by Mr. H. H. Travers, and upon this I at once commenced operations.

The plan I adopted was to separate, as well as I could, all the more immediate proximate constituents of the seed (in which the poison is known to exist), and to test each likely one by itself, in its effects upon the animal economy.

First, I extracted a portion of the finely-ground seed with cold water, and another portion with weakly acidified water, and treated them separately by a new process, now much in vogue, for the separation of alkaloids (Rogers and Girwood), all the evaporations being conducted at a temperature not exceeding 90° F.

The residuum from these processes was very small, and gave no indications of the presence of alkaloids to the proper tests; it consisted almost wholly of gummy matters.

The result seemed to dispose of all that was soluble in water or weak acids, and, to a certain extent, impugned the correctness of the general idea that this poison is of the nature of an alkaloid.

The part of the seed insoluble in these reagents was next examined.

Alcohol was passed through this repeatedly and the extract evaporated, when a large quantity of a greenish-red coloured substance discovered itself. This, treated with ether, separated into two parts, one a green-coloured oil, soluble therein, the other a resinous substance quite insoluble in this menstruum.

The resinoid substance was reserved for after-examination, and the oil at once tested in regard to its effects on the animal economy.

For this purpose I administered about five minims of it to a full-grown cat, after a twelve hours' fast; the oil acted as an emetic in a short time, and the greater portion of it was vomited. In half an hour, however, the animal showed signs of uneasiness, and convulsive twitches of the ears and eyes, together with a forward jerking of the head, took place, also much frothing of the mouth, culminating in a convulsive fit, in about one hour after the dose was administered. After a little while this fit passed off, only the twitches and forward jerkings continuing; but a second very severe fit, of short duration, occurred in about one hour afterwards, after which the cat gradually rallied. These symptoms agreed generally with those exhibited by cattle and sheep when poisoned by this plant.

Although I have made but one experiment, I think it will be allowed that the result of this has fairly proved that the poison of the seed, and so, by a very proper inference, the poison of the plant generally—since I find an oily substance throughout it—exists in this oil, if it is not the oil itself. It therefore now only remains to be ascertained whether this oil is a single proximate substance or a mixture or compound of such, and if the latter, which is, or which are, the active ones concerned in the production of these phenomena I have described. Unfortunately, I had not sufficient of the oil to allow me to test this properly, but I am in hopes of having it shortly, as I have been promised a large quantity of these seeds from Taranaki.

The following are the characteristics of this oil, as ascertained up to the present time.

Somewhat viscid at common temperature, but flowing freely at a little above this; colour, pale green; reaction, acid; taste, bland; burns away readily with much flame; scarcely volatile without decomposition; soluble in ether, alcohol, chloroform, and strong acetic acid; insoluble in hydrochloric or nitric acid; also insoluble in water; does not dry when long exposed to the air.

When boiled with solutions of the caustic alkalies there is much frothing, but only a portion of the oil dissolves, even when the boiling is continued for many hours; the portion dissolved was found to be saponified. The whole of the oil is, however, soluble in a cold alcoholic solution of potash, without yielding a precipitate when admixed with water; hence it is probable that all the acid portion of the oil is really saponifiable,—that which was unsaponifiable, in the first instance, being a product of the metamorphosis of a portion of the normal oil by the process employed.

When the oil is heated to the decomposing-point, a substance is given off having the pungent odour of acrolein, a substance characteristic of the presence of glycerine, or oxide of lipyle, the base of common fatty bodies.

Heated with caustic alkalies, either in the wet or the dry way, there are no alkaline vapours evolved, but in the latter case an odorous oil forms, probably œnanthylic acid.

From the reaction of this oil, here described, it evidently belongs to the series of non-drying fixed oils; in its solubility in alcohol or acetic acid, it bears a remarkable resemblance to castor oil, the only other fixed oil which I find to be wholly soluble in acetic acid. Now, castor oil, it will be remembered, is a very peculiar oil. It does not contain any of the acids of the common oils or fats, but in place of them, two very singular acids, quite peculiar, I believe, to this variety of oil; hence I conceive the acid part of this oil of Tutu to be also quite distinct from the ordinary fatty acids; to be, in all probability, peculiar to it; and to one or more of these acids I should ascribe the poisonous effects of the oil.

If further experiments should confirm the correctness of the views here stated, this case will, I conceive, become invested with an interest beyond that immediately under our notice, since it will offer another instance in which a non-nitrogenous oily principle is proved to affect the system like a neurotic poison, this class of poisons being almost always alkaloids, or at least nitrogenous substances.

Now it will be remembered there are several poisonous plants in Europe which have, hitherto, refused to yield any pure poisonous principle to chemical processes, but then these processes have been, as a general rule, I believe, especially for the detection of alkaloids. With this case to point, therefore, it does seem in the highest degree probable that, in some of these cases, at least, the poisonous effects may be due to a non-nitrogenous oil, not yet isolated or examined. In view of this I have recommended the subject for examination to a friend of mine residing in England, so that I expect in a few months to hear something more of this, or else to have selections of seeds, etc., from the plants I have named in my letter, so that I can inquire into this subject myself.*

* Since this paper was read, I learn from the *Chemical News* (vol. xx. p. 70) that M. Van Ankum has discovered

With regard to antidotes for administration to animals, etc., poisoned with the Tutu plant, I should be inclined to think that, in addition to emetics and purgatives, very dilute acids would be beneficial, since, by preventing saponification of the oil, they would tend to keep it insoluble and therefore inert.

As being somewhat related to the subject, I may state that the seed of the Karaka-tree (*Corynocarpus lævigata*), which is also of a poisonous nature, has refused, in a similar manner, to yield any alkaloid to my processes, but it gives up an oil to alcohol, which resembles the above in some of its reactions. It seems to exercise a specific effect upon the animal economy when administered in small doses, inducing at first great uneasiness, and afterwards restless, unwilling sleep, with sudden starting. Unfortunately I had not sufficient of it to get any decisive results.

This oil is also soluble in alcohol, acetic acid, ether and in hydrochloric acid.

It is very bitter, and feebly soluble in water.

In one important respect it differs from the oil of Tutu. It evolves ammonia when boiled with potash, thus, in regard to its composition, allying itself to the alkaloids, though in its reactions apparently distinct.—*Chemical News.*

the poisonous principle of the *Cicuta virosa* to be an essential oil, of formula $C_{10}H_8$, but "could not find any alkaloid in this plant at all." This was one of the plants especially selected for examination in the communication alluded to.

IMPROVED METHOD OF PRODUCING HYDROGEN GAS.

MM. Tessié du Motay and Maréchal, who have lately discovered a mode of obtaining cheap oxygen for illuminating and medical purposes from the manganates of soda, have sought a more practical and economical method of producing hydrogen by the decomposition of water by means of carbon, and they have discovered the following method, which has given the most extraordinary results. Alkaline and earthy alkaline hydrates, such as the hydrate of potash, soda, strontium, baryta, chalk, etc., mixed with charcoal, coke, anthracite, pit coal, peat, etc., and heated to a red heat, are decomposed into carbonic acid and hydrogen, without further loss of heat than that due to the production of the carbonic acid and hydrogen. The hydrates of potash, soda, etc., and more especially the hydrates of chalk or lime, decomposed by the coal into hydrogen and carbonic acid, can be used indefinitely in this process, provided they are moistened each time with water, so as to reproduce the decomposed hydrates. In this operation, the hydrogen gas is generated without any special production of steam, and may thus be produced without any other generating apparatus than the retorts themselves. These retorts, not being exposed to the direct action of the steam, are not subject to any interior alteration or damage. It follows, therefore, that the hydrogen gas produced by the decomposition of the above-named hydrates by means of carbon can be generated at a very small cost, and with the same facility as carburetted hydrogens from the distillation of pit-coal or rather organic hydro-carbon matter. These alkaline and earthy alkaline hydrates may be mixed with the different mineral or vegetable combustibles, either in a definite chemical proportion, or without a fixed or determinate proportion, and in any suitable distilling or heating apparatus, in order to produce, when heated to a red heat, hydrogen gas for illuminating and heating purposes. The advantage of the production of hydrogen as cheaply as oxygen, which has been obtained, is likely to create a revolution in many industries, and especially in metallurgy. A cheap method of producing a great heat in order to reduce metals, such as platinum, gold, silver, and iron, has long been sought for in Europe, where the oxyhydric blowpipe is now used to melt the platinum in a calcium crucible. By this discovery it becomes possible to obtain an immense heat which could be regulated by a simple tap. Enamellers and porcelain makers may thus get rid of one of their greatest troubles.—*Journal of the Society of Arts.*

PHARMACEUTICAL NOTES.

BY ALBERT E. EBERT.

On several occasions we have been requested by physicians to prepare pills from the oil of yellow sandalwood, each containing from five to ten drops. This we accomplished to the satisfaction of both prescriber and patient, by the following method:—

Take of Oil of Yellow Sandal Wood,
Yellow Wax, each half a troy ounce.

Melt the wax in a capsule and weigh into it the oil of sandal wood; mix and stir until cold, then roll out the mass, and divide it into 80 pills, by means of the pill-machine or pill-tile, in the same manner as an ordinary mass, and sprinkle with marshmallow-root powder. Each pill contains three grains, or about five drops of the oil. The excipient is unobjectionable, as it is readily soluble in the juices of the stomach. In the same manner we have made pills of the oils of cubebs, black pepper and fleabane.

Tincture of Calabar bean is frequently prescribed, and there is considerable variation in its strength as dispensed by different pharmacists. We have been accustomed to prepare the tincture, using one part of bean to ten of liquid, the menstruum consisting of alcohol, three parts, and water, one part. The bean, previously reduced to a fine powder, is macerated for several days with the water, the alcohol is then added, and the whole is allowed to macerate eight days longer. Finally, the mixture is thrown upon a filter, and when the liquid has ceased to pass, pour upon the residue sufficiency of the alcoholic menstruum to make up the original measure. It is difficult, by means of the mortar and pestle, to reduce the whole of the calabar bean to the requisite degree of fineness; besides, by this means much waste of the valuable material must occur. To avoid these difficulties, we have resorted to the goodwife's sanctum and appropriated that piece of apparatus so indispensable to a cup of good coffee, namely, the coffee mill, which we have found to answer to a charm the purpose of reducing the Calabar bean without incurring loss and without waste of time. We can heartily recommend the purchase of such a mill for use in reducing small quantities of many hard drugs, as stramonium and colchicum seed, etc.

Extract of Calabar bean is quoted by certain manufacturers of pharmacal preparations at $1.25 per ounce. Having had some demand for the article we undertook to prepare the article, and after thoroughly exhausting the bean, upon evaporation of the solution, were surprised to find the yield of extract to be but a trifle over one troy ounce from sixteen troy ounces of the bean. We find that other manipulators have obtained even smaller results. The query naturally arises, how can any manufacturer find it profitable to furnish the extract at $1.25 per ounce, when it requires one pound of material, costing $4 to obtain that quantity, to say nothing of the cost of menstruum, labour, etc.?

The dose of the tincture, as usually prescribed, is fifteen drops; that would indicate the dose of the extract to be about one-twentieth of a grain.

Lard is an article constantly required in galenical pharmacy, and upon its purity and freedom from rancidity depends, in great measure, the preparation of such ointments and cerates as will be creditable to the careful dispenser. Lard of the requisite quality is within the reach of all who will take the trouble to render it from the "leaf lard," which, in the proper season, is always obtainable. The difficulty in the way is the preservation of a sufficient supply from season to season without its becoming rancid. Many suggestions have been made by different writers, having in view the preservation of lard, by such means as the addition of gum resins, balsams, or solutions of the same, etc., but all are liable to some objection. The best and simplest method of accomplishing the desired end that has come under our notice is that followed in the Apothecaries' Hall, at Glasgow, Scotland, where the freshly-prepared lard is filled into bladders, which are afterwards tied at their necks and suspended in a cool cellar.

Savin Cerate.—This excellent irritant cerate is but little used at present; indeed, so seldom is it prescribed, that the dispenser is apt to find to his dismay his stock on hand, injured by exposure and age. It is preferable, therefore, to prepare this cerate extemporaneously, when required, and this can be readily done by keeping for the purpose the oleo-resin of savin, prepared by exhausting the leaves with ether, and evaporating according to the U. S. P. formula for the cerate. By weighing the oleo-resin, and ascertaining the proportionate amount appropriate to each ounce of cerate, the two may be mixed whenever required.

Ointment of Iodide of Sulphur.—The direction of the Pharmacopœia "to reduce the iodide of sulphur to a fine powder, with a little of the lard," has not proved practicable in our hands, as by the process we have failed to reduce the iodide to the fine state of division essential to a good ointment. Several modifications have been proposed, as triturating with small quantities of alcohol, ether, chloroform, and bisulphide of carbon; but these substances have little solvent action on the iodide; the use of the iodide of potassium has also been suggested, but this decomposes the iodide and hence is objectionable. Oil of turpentine has been used, but we have found the best success attending the use of the oil of lavender as a solvent—a few drops being sufficient, and there can be no reasonable objection to this addition.

To secure dispatch in the mixing of extracts with ointments and cerates, we keep such extracts as belladonna, stramonium, opium and arnica, in a fluid condition, by means of equal parts of water and glycerin. The diluted glycerin is added to its own weight of extract, and when the latter is prescribed in combination with a cerate, it, of course, is only necessary to substitute for the extract double its weight of the liquefied article.

It is of frequent occurrence that prescribers direct large quantities of watery or alcoholic solutions to be mixed with ointments or cerates. The best means of incorporating the greatest possible quantity is to melt the fatty matter and stir in the solution.

Tannic acid is seldom found in the matter of such purity as to form a clear solution. To facilitate the dispensing of solutions of this acid, we are accustomed to keep on hand a clear standard solution, preserved by glycerin. It is prepared by dissolving the tannin in a small quantity of water, filtering the solution, adding a weight of glycerin equal to that of tannic acid employed, and evaporating the fluid to such an extent that each part of tannin is represented by two parts by weight of the solution.

Suppositories.—When moulds of block tin are used, the main point necessary to secure success is to have the moulds *thoroughly chilled* by ice before the addition of the melted material; when this is observed, there is no difficulty in removing the suppositories with ease and within a few minutes.

Rose Water.—When this is prepared from the oil by rubbing with magnesia and adding water, a certain loss of oil occurs (absorbed by the magnesia) and the resulting water will not give clear solutions with nitrate of silver, owing to the solution of a minute quantity of the carbonate of magnesia, or of saline matters contaminating the latter, or both. A better method, and which, of course, yields a pure product, is to drop the oil into boiling distilled water and incorporate by agitation. Other medicated waters may be prepared in a similar manner. —*The Chicago Pharmacist.*

BROMIDE OF POTASSIUM.*

In 1826 M. Barthez and MM. Andral and Fournet published the results of researches made by them into the physiological and therapeutical action of bromine and of the bromide of potassium.† They reported that bromine possessed the power of rapidly removing pain in joints affected by chronic arthritis, and of lessening the swelling, immobility and deformity. M. Pourché, of Montpellier, also had found the bromide of service in the treatment of bronchocele, and in scrofulous affections.‡ MM. Puche, Huette and Rames attributed to this salt an anæsthetic action; and M. Thielmann, a Russian physician, asserted that it exercises a marked sedative action upon the organs of generation. In 1836 it was introduced into the London Pharmacopœia in consequence of the great success that had followed its use by Dr. Williams, of St. Thomas's Hospital, in cases of enlarged spleen. It did not prove equally useful in the hands of other practitioners. The observations of M. Thielmann and others bore but little fruit till they fell under the notice of Sir Charles Locock and led him to try the bromide of potassium in cases of "hysterical epilepsy." In 1857 Sir Charles stated to the Medical and Chirurgical Society that he had given the drug, in ten-grain doses, in fourteen or fifteen cases of epilepsy, and that the drug had proved eminently useful.§ Since then the bromide has become a very "fashionable" medicine, and in consequence has been misused and overrated, and credited with recoveries with which it had in reality no other relation than one of time. As a consequence of this, the pendulum of opinion has in some minds swung to the opposite extreme; and there are to be found those who doubt whether the drug possesses any real remedial powers at all. There can, however, be no doubt that when "mixed with brains" it is a medicine of very real and great value.

Its *mode of action* can hardly yet be defined with clearness and certainty. Many observers have reported on it, but their conclusions have in several cases been perplexingly contradictory. At present the conclusions arrived at by Dr. Robert Amory‖ seem most satisfactorily to explain its therapeutical properties. He considers, from his experiments, that the effects of the drug are produced by its direct action on the blood-vessels, or the vaso-motor system which controls the action of those vessels, and that this action can account for and explain all the physiological and therapeutical actions of the drug. He reports that the bromide is easily absorbed by the mucous membranes and by the skin, provided that the water in which it is dissolved is below the temperature of 75° Fahrenheit; that its elimination is conducted by the skin and kidneys, and that in therapeutical doses it is not eliminated by the intestines or the lungs; that it passes out of the skin without decomposition; that the larger the doses the more intense and enduring is the action on the vaso-motor system; and that its action upon the general nervous system is secondary to and dependent upon that of the vaso-motor nerves. Dr. Russell Reynolds also, in a valuable and instructive paper on "The Therapeutic Uses of Bromide of Potassium,"** records his opinion that the specific action of the drug "is exercised on the system of vaso-motor nerves, and that it acts upon that system as a sedative."

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* Abstracted from a series of papers on the Progress of Therapeutical Science in the *Medical Times and Gazette.*

† *Journal de Chim. Méd.*, etc., t. v. p. 214.

‡ *Ibid.*, t. iv. p. 594.

§ *Medical Times and Gazette*, vol. i. p. 525, 1857.

‖ *American Journal of Medical Sciences*, 1869.

** *Practitioner*, vol. i. pp. 5–17.

As a medicine, the highest value of the bromide lies in its remedial powers over epilepsy. On this point the general experience of the profession agrees pretty closely with that of Dr. R. Reynolds, who asserts that, in the vast majority of cases it is of signal service, and that, while it absolutely cures very many cases, it rarely fails to diminish notably the number of attacks where it does not cure.

In many disorders producing or accompanied by mental disturbance or sleeplessness the drug renders very great service.

In delirium tremens it has also proved of great service, calming the delirium, producing sleep, and removing delusions.

The bromide of potassium possesses yet further this advantage, that it can be given without any danger whatever. Certain inconveniences and discomforts may attend its exhibition, but no dangers. Thus, it not infrequently excites acne or acneiform eruptions on the face or other parts; but, *en revanche*, acne of long standing has sometimes entirely disappeared during its exhibition. In full doses, very rarely in moderate doses, the drug may induce redness of the palate, epigastric heat, œdema of the lining membrane of the mouth, and salivation, drowsiness, confusion of mind, depression, failure of memory in a remarkable degree, and weakness of the arms and legs; but all these evils entirely disappear on the discontinuance of the drug. No permanent ill-effects have ever been observed to follow its employment.

Vegetable Wax in Japan.—From the notes of a short tour through the eastern parts of the provinces of Echigo, Iwashiro and Uzea, made in June and July of the present year by one of H.M.'s Consuls in Japan, we extract the following:—"In passing through Yazawa and some other villages, we found hemp, said to be of good quality, grown in frequent localities on the way, and vegetable wax trees in abundance. I was informed at Tsugawa that the extraction of lacquer from the same tree is prohibited there, the tree being reserved for the production of wax. As the lacquer is obtained by making incisions in the bark of the tree while young, the result of which is the death of the tree before coming to full maturity, both products can hardly be obtained from the same tree. This appears to be the reason for the prohibition. At Yonezawa, on the other hand, the extraction of lacquer from the tree is permitted, the result of which is, that little vegetable wax is produced there. I observed that many of the trees in the neighbourhood of Tsugawa had been injured, apparently, by the severity of last winter." The trees here alluded to are those belonging to the genus *Rhus*,—the most important wax-producing species in Japan being *R. succedanea*, L., the bulk of the varnish being yielded by *R. vernicifera*, Dec. The wax is obtained from the small fruits, while the varnish is procured by tapping the trees. The species met with at Tsugawa must have been *R. succedanea*, as this species yields both wax and varnish. Several other species also yield varnish more or less in China and Japan. Little is known about the preparations of this varnish as used in the ancient lacquer-work of the Japanese; and it is said that the modern workers in this article in Japan have themselves lost the secret of its preparation.—*Nature.*

Petroleum.—The year's business in refined American oil has been on a most enormous scale, the exports from the United States up to the 16th of December, 1870, reaching the total of 3,254,374 barrels, against 2,496,046 barrels for the whole of 1869, although the shipments of 1869 were in excess of any former year. It would thus appear that the supply is almost inexhaustible; and as the value of the year's shipments is about £8,000,000, it will be seen how important a part petroleum plays in the world's commerce. It is deplorable that the Act of 1868 should, as it most undoubtedly does, seriously interfere with the growth of the trade in this country. The dealers of the United Kingdom are harassed by laws that have no parallel either in America or the great consuming countries of the Continent. Meantime, the English public continue to pay higher prices than the inhabitants of more distant countries, who are not forced to import a special article, while the really dangerous petroleum spirit, or benzoline, is still admitted into our ports in growing quantities. The range during the past twelve months was from 1*s.* 5*d.* per gallon to 1*s.* 11*d.*; and closing prices are 1*s.* 6¼*d.* for contract quality, and 1*s.* 6½*d.* to 1*s.* 6¾*d.* for fine.—*Messrs. Phillips and Webb's 'Trade Report for* 1870.'

APOTHECARY-GENERAL (IRELAND).

Our readers will be well satisfied to learn that, at the last moment, even after the date of the appointment had been fixed, the Commissioners, who, as we hinted last week, had changed their minds, communicated to the conference of the Poor-Law Guardians of the North and South Dublin Unions, held on Friday, Jan. 6th, that they would not press this appointment in its present form. The suggestion of inspection which we proposed will probably be adopted. They do not appear to consider now that the qualification of apothecary will be a *sine quâ non*, as it might have the effect of excluding eminently qualified individuals from competition. If the principle of inspection be adopted, there can hardly be less than four inspectors, one for each province, considering that the number of dispensary stations and workhouses in Ireland is over twelve hundred. The Commissioners add that the subject will probably be brought before Parliament. We counsel the Poor-law medical officers of Ireland to see that their county representatives bring their claims not only for the holding of the appointment, but also for assisting in the appointing of these inspectors, before the members of Parliament for each county. In this first step towards promotion in Irish Poor-Law service, they may rely on the political co-operation of both the British Medical Association and the Poor-Law Medical Officers' Association of England. —*British Medical Journal.*

DRUG MARKET NOTES.

The following were among the parcels of drugs offered for sale last week:—

Aloes,—Cape, 149 cases; Barbadoes, 54 kegs; Socotrine, 45 boxes; East Indian, 23 packages.

Castor Oil, 498 cases.

Senna,—Tinnevelly, 90 bales; Alexandrian, 20 bales.

Galls,—Bussorah, 64 sacks; Turkey, 173 bags.

Talca Gum, 31 bales.

Nux Vomica, 186 bags.

Cardamoms,—Malabar, 6 cases; Madras, 3 cases.

Ipecacuanha, 13 serons; Carthagena, 6 barrels.

Canella Alba, 20 cases.

Cascarilla Bark, 50 sacks.

Colocynth, Turkey, 20 packages.

Bark,—Soft Columbian, 107 serons; Calisaya, 68 serons; Pitayo, 31 serons; Crown and Carthagena, 86 serons.

Jalap, 42 bales and 2 bags.

Gum Benjamin, 96 cases.

Ergot of Rye, 6 cases.

Tonquin Beans, 6 bags.

China Vermilion, 9 boxes.

Squills, 20 bags.

Calabar Beans, 1 barrel.

Chamomile Flowers, 20 bales.

Senega Root, 7 bales.

The Pharmaceutical Journal.

SATURDAY, JANUARY 14, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed* "*Pharm. Journ.*"

THE YEAR-BOOK OF PHARMACY.

WE are glad to be able to announce that the 'Year-Book of Pharmacy' for 1870 is now ready for delivery. It forms a handsome octavo volume of about 600 pages, containing a large quantity of information that cannot fail to be interesting and useful to every pharmacist.

With respect to the delivery of the Year-Book, the following card is being issued to metropolitan members, and to the residents in towns which contribute less than three names to the roll of the Conference:—

"On signing this card, and presenting it to Messrs. J. and A. CHURCHILL, publishers, 11, New Burlington Street, London, W., you will be supplied with one copy of the 'Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference, 1870.' If you wish the book to be forwarded, please to send with the card full directions as to route, and also enclose to Messrs. CHURCHILL stamps in prepayment of carriage. It can be sent by post for 7½*d*.

"Gentlemen joining the Conference before June 30, 1871, and paying the yearly subscription (5*s.* by cash, P.O.O., or stamps, to the London General Secretary, Professor ATTFIELD, 17, Bloomsbury Square, W.C.) will be entitled to a copy. Price to non-subscribers, 7*s.* 6*d.*"

To all other towns the volumes will be consigned, chiefly through the courtesy of wholesale houses, to the care of the local secretary, who will forward them to the members. The local secretaries are those gentlemen who formerly were local treasurers, and who have done so much to promote the success of the Conference. They have been relieved of the labour of collecting subscriptions by the appointment of a paid assistant to the London Secretary, and by the necessity, in view of the issue of the Year-Book, of direct relations being established between the financial officer and each member. According to a regulation of the committee, the work is to be supplied only to members who have paid the annual subscription. Considering the resources of the Conference, this rule is clearly indispensable.

We hope that the Executive of the British Pharmaceutical Conference will have the active assistance of every person who desires the well-being of Pharmacy, in their efforts to supply a want long felt in this country, and in which England stands almost alone, namely, the annual issue of such a Year-Book.

THE CHEMISTS' BALL.

THIS annual gathering, which resembles in its pleasant associations the meetings of the British Pharmaceutical Conference, is announced to take place on Wednesday, the 25th of January. The list of stewards, growing year by year, presents on this occasion a most imposing array of well-known names, and includes among others the President, Vice-President, Treasurer and Professors of the Pharmaceutical Society, a sufficient testimony to the propriety and good taste which have characterized all previous *réunions*, and a guarantee of the success of this year's assembly. The Committee are exerting themselves most laudably in making the necessary arrangements, and the LORD MAYOR, himself a druggist, has consented to be Patron. Tickets, Lady's, 10*s.* 6*d.*; Gentleman's, 17*s.* 6*d.*, including supper, wine and refreshments, may be obtained of any member of the Committee, of Mr. THOMAS BILLING, Hon. Treasurer, 143, New Bond Street, W., and Mr. T. D. WATSON, Hon. Sec., 46, Halton Road, Canonbury Square, N.

SALE OF POISONS ACT IN IRELAND.

THE first case of prosecution under this Act seems to have taken place in Galway, in connection with the death of a Mr. HOLTON. From the *Daily Express* correspondent, it would seem that the magistrates of the Galway Petty Session inflicted penalties in two cases.

Messrs. STAUNTON and M'SWINEY, two well-known and respectable apothecaries, were each separately summoned for selling poison without registering it in a book which should have been kept for this purpose. The occurrence which was the occasion of these summonses, was one in which a rich farmer of Galway, named HOLTON, having had some family misunderstanding, purchased poison from the apothecaries above named, and having drunk it, was found dead next day.* The police under the direction of F. W. CULLEN, Sub-inspector, issued summonses, and the defendants were each fined 5*s.* and costs. Mr. GREEN, one of the magistrates present, expressed his opinion that a heavier penalty should be imposed.

POOR-LAW UNIONS APOTHECARY FOR IRELAND.

IT is not the intention of the Poor-Law Commissioners to proceed with the Union Apothecary Order in its present shape. This is due to the opposition of about one-third of the Guardians. Of the 163 unions in Ireland, 45, including the North Dublin, South Dublin, Cork and Belfast, had passed resolutions adverse to the arrangement proposed; nearly the same number had expressed themselves in favour of it, and the remainder had accepted it without expressing any opinion.

* See *ante*, p. 514.

It had been suggested that the limitation requiring the qualification of an apothecary in the manager of the general depot was unnecessary, and had the effect of excluding eminently qualified individuals from competition. The general feeling is, that such a man should be an analytical chemist of position, possessing a thorough knowledge of the manufacturing and manipulating of drugs and chemicals.

The Commissioners have stated that they intend producing another scheme, as every one has acknowledged the desirability of some action being taken in this matter.

MEDICINES FOR THE IRISH UNIONS.

The following is the text of the letter issued by the Poor Law Commissioners of Ireland, revoking their previous sealed order for the appointment of an Apothecary-General to the Poor Law Unions of Ireland, in whose hands were to be concentrated the whole of the contracts for drugs and medical necessaries throughout Ireland:—

"POOR LAW UNIONS APOTHECARY.

"Poor Law Commission Office, Dublin,
"*5th January*, 1871.

"Sir,—Adverting to their recent order for the appointment of a poor law unions apothecary, the Commissioners for Administering the Laws for Relief of the Poor in Ireland desire to inform the guardians that the time having now arrived for taking the first steps in execution of the order, they have determined not to proceed with it in its present shape. So much complaint has been made of the quality of the medicines supplied for use in workhouses and dispensaries that the Commissioners anticipated a general acquiescence on the parts of the Boards of Guardians in the adoption of an arrangement which appeared eminently calculated to secure good and reliable medicines in future for the treatment of the sick poor. Of the 163 unions in Ireland, however, 45, including North Dublin, South Dublin, Cork, and Belfast, have passed resolutions adverse to the arrangement proposed, nearly the same number have expressed themselves in favour of it, and the remainder have accepted it without expressing any opinion. Under these circumstances it is not the intention of the Commissioners to force the adoption of this arrangement upon so many unions adverse to the principle involved. Suggestions have been made which, in the event of their issuing an amended order, it will be the duty of the Commissioners in the meantime to consider. For example, the mode of appointment laid down in the order is objected to, and a competitive examination of candidates suggested instead; but in the present state of the law the Commissioners do not feel themselves to be authorized to withdraw the direct appointment from the Boards of Guardians of the unions united for that purpose, though possibly some different mode of making it may be adopted. It has also been suggested that the limitation requiring the qualification of 'apothecary' in the manager of the general depot was unnecessary, and had the effect of excluding eminently qualified individuals from competition; this point will also receive attention in the preparation of any amended order. The application of the co-operative principle to the poor law unions which would have been effected by this order in regard to drugs was probably not contemplated in the Irish Poor Law Act of 1838; and although that Act contains powers enabling Boards of Guardians to purchase supplies in common, and to appoint a common officer for the purpose, it may be found desirable to bring the subject under the consideration of Parliament before any further steps are taken.

"By order of the Commissioners.
"B. Banks, Chief Clerk.

"To the Clerk of each Union."

It will be observed that the withdrawal is not unconditional, and it has been resolved by the guardians to appoint a "Vigilance Committee" to watch whatever steps the Commissioners may take in the matter, whether by sealed orders or seeking additional legislation. It seems to be the intention of the Commissioners to lay the future appointment (probably inspectional) open to analytical chemists and pharmacists of repute.

The executor of the late Mr. Cole, of Hampstead, has written to say that it will be his duty to pay over to the Benevolent Fund of the Pharmaceutical Society a bequest of nineteen guineas out of that gentleman's estate.

It will be seen by reference to page 571 that Mr. John Carr, of 171, High Holborn, has been chosen by the Council to fill the vacancy caused by the resignation of Mr. Cornelius Hanbury.

The necessity of examining drugs supplied to workhouse dispensaries is illustrated by Dr. Leeper, of Keady, who states that he has been supplied with train-oil for cod-liver oil; opium so impure as to be almost useless; muriated tincture of iron unfit for use; spirits of wine, which should be 56 over-proof, not quite 10 over-proof; tinctures which mouldered, and ointments unfit for use. The *British Medical Journal*, after the above statement, adds, "There is at present no inspection in England any more than in Ireland, and it will be eminently necessary to provide it in the new metropolitan dispensaries. We suggest this subject to the attention of the Poor Law Board."

The third volume of the *Chicago Pharmacist* having been completed, it is announced that an alteration will be effected in its future appearance, by the use of "solid" instead of "leaded" type, and the omission of the "prices current." It is calculated that these changes will give room for about one-third more matter, without increasing the size of the Journal.

We are glad to notice that the suggestion that a hyphen should be used to separate the syllables in the name of the new disinfectant, Chlor-alum, was adopted last week in the columns of the *Lancet*.

We learn from *Nature* that the cultivation of cinchona has so fully succeeded in the Neilgherry hills, in India, that the first shipment of bark from a private plantation, to the extent of 4000 lb., is taking place.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

January 4th, 1871.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Bourdas, Dymond, Evans, Hills, Savage and Williams.

The minutes of the last meeting were read and confirmed.

The President reported that arrangements had been made with Dr. Carpenter for the delivery of two lectures on the Microscope and its Revelations, on Wednesday, the 1st February, and Wednesday, the 1st March, instead of the usual evening discussions on those dates.

Mr. Cornelius Hanbury's Successor.

Resolved unanimously—That Mr. John Carr, of 171, High Holborn, be elected a Member of this Council, in place of Mr. Hanbury resigned.

The following letter having been read:—

"14, *George Street, Croydon, January 2nd*, 1870.

"Sir,—Mr. Charles Coles, late of 1, King's College Road, South Hampstead, deceased, by his will, left a legacy of £19. 19*s*. to the Benevolent Fund of the Pharmaceutical Society of Great Britain. I am the acting executor under his will; as soon as I have realized the estate, I shall have pleasure in sending you a cheque for the amount.

"Yours faithfully,
"Wm. F. Coles.

"*To* E. Bremridge, Esq."

It was resolved—That this Council desire to express their condolence with the relatives of the late Mr. Charles Coles, of Hampstead, who was for many years an active member of the Society, and wish at the same time to acknowledge the receipt of his executor's letter announcing a legacy of nineteen guineas bequeathed by him to the Benevolent Fund.

The following letter was also read:—

"*Liverpool, 21st December*, 1870.

"My dear Sir,—In compliance with a resolution of the Local Committee of the Pharmaceutical Conference, recently held in Liverpool, I have the pleasure of forwarding to you a cheque for twenty guineas (being a portion of the surplus of the Local Fund remaining over and above the expenses incurred), to be applied to the Benevolent Fund of the Pharmaceutical Society.

"Yours faithfully,
"John Shaw,
"*Treasurer*.

"*To* E. Bremridge, Esq., *Secretary, Pharmaceutical Society, London*."

Resolved—That the best thanks of the Council are due and hereby tendered to the Local Committee at Liverpool of the British Pharmaceutical Conference for 1870, for their donation of twenty guineas to the Benevolent Fund of this Society.

The Report and recommendations of the Finance Committee were received and adopted.

Resolved—That the Report and recommendations of the Parliamentary Committee be received and adopted.

Resolved—That the Registrar be directed, and is hereby authorized, to erase from the Register of Chemists and Druggists the name of Edward Moore, of Chippenham.

Resolved—That the Registrar be requested to give the Society's Solicitors the necessary instructions to proceed against Edward Charles Whisken, of Welshpool, for continuing to use the title of Chemist and Druggist, and retail poisons, his name having been erased from the Register.

The Report of the Library, Museum and Laboratory Committee was read and received.

The following letter was read:—

[Copy.]

"*Medical Department of the Privy Council Office*,
"*23rd December*, 1870.

"Sir,—I am directed by my Lords of her Majesty's Council to request that you will call the attention of your Council to the power which is, by the Pharmacy Act, 1868, given to the Pharmaceutical Society to make, with the consent of the Privy Council, regulations as to the keeping, dispensing, and selling of poisons.

"My Lords believe it to have been the opinion of Parliament that proper regulations in this matter are required for the protection of the public, and, as more than two years have elapsed since the passing of the Act without the Pharmaceutical Society having proposed any such regulations, my Lords think it right to inquire whether the Pharmaceutical Society intends, within any time you can specify, to propose such regulations to their Lordships. They direct me, therefore, to request that you will have the goodness to give me, at your earliest convenience, the information required by their Lordships.

"I am, Sir,
"Your obedient servant,
"John Simon.

"*The Registrar, Pharmaceutical Society*."

Resolved—That the letter from the Medical Officer of the Privy Council, addressed to the Registrar respecting the storing of poisons, be received and entered on the Minutes, with the Registrar's reply thereto.

REPORT OF THE BOARD OF EXAMINERS.

December, 1870.

England and Wales.

	Candidates examined.	Candidates passed.	Candidates failed.
December 21, Major	10	7	3
" " Minor	10	10	0
" 23, "	23	18	5
	43	35	8

Preliminary Examination.—1 Certificate approved.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Chase, Thomas, jun. ....London.
Clark, Walter Beales ....Leicester.
Cross, William Gowen........Shrewsbury.
Griffin, Thomas ....Bromley.
Haydon, William Frederic....Blandford.
Ingham, John ....Upper Tooting.
Mason, Philip Henry ....Norwich.
Metcalfe, Edmund Henry ....Richmond.
Paton, James................Edinburgh.
Pick, Richard ....Hull.
Robinson, James ....Darlington.
Skipper, Edward ....London.
Taylor, John William........Great Grimsby.
Thompson, John Thomas ....Richmond.
Young, Joseph ....Leicester.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be elected Members:—

Barton, Henry	St. Ives.
Chase, Thomas, jun.	London.
Clarke, Walter Beales	Leicester.
Conder, George	London.
Ingham, John	Upper Tooting.
Jones, Hugh Lloyd	Victoria, British Columbia.
Machin, Frederick John	Huyton.
Manby, Walter Edward	Southampton.
Metcalfe, Edmund Henry	Richmond.
Moss, John	London.
Pick, Richard	Northallerton.
Pilley, Henry Thomas	Boston.
Strickland, George Hodgson	Yarm.
Thompson, John Thomas	Richmond.
Webb, Edward Alfred	Redstone Manor, Redhill.

Resolved—That the following registered Chemists and Druggists be elected Members of the Society:—

TOWN.	NAME.
Barnsley	Billington, Frederick.
Barrow-in-Furness	Sansom, Edwin.
Bettws-y-Coed	Jones, Owen Lloyd.
Bridport	Coppock, Henry Jones.
Brighton	Leech, William.
Bristol	Townsend, Charles.
Evesham	Pumphrey, John.
Hawkhurst	Stainburn, Joseph.
Ilford	Beal, Edmund John.
Largs	Fraser, Alexander.
Leeds	Exley, George.
Newcastle-on-Tyne	Welch, Thomas.
Portsea	Liddiard, William.
Shildon	Veitch, Thomas D.
Swansea	Layng, Thomas B.
Tonbridge	Gower, Alfred.
Usk	Jones, David Lewis.

Resolved—That the following, having passed their respective examinations, be elected "Associates in business":—

MINOR.

Durrant, George Reynolds	Hertford.
Fisher, Richard	Preston.
Keightley, Joseph	Tunstall.

MODIFIED.

Foulds, Astley Cooper	Nuneaton.
Frobisher, Frederick	Birmingham.
Graham, Monkhouse	Middlesborough-on-Tees.
Herron, Archibald James	Margate.
Lucas, William	Manchester.
Moody, Alfred	Landport.
Pattinson, Michael Hind	Carlisle.
Rees, David	Llanidloes.
Williams, John	Birmingham.
Williams, William	Llanfyllin.

Resolved—That the following, having passed their respective examinations, be elected Associates:—

MINOR.

Blyton, John	Liverpool.
Collishaw, John	Nottingham.
Brewis, Thomas	Rothbury.
Darby, Samuel Aldred	Reading.
David, John	Newport, Mon.
Dawson, William Powell	Horncastle.
Field, Charles	Netley.
Fowler, William Ratcliffe	Ipswich.
Rieveley, Charles	Birkenhead.
Skinner, Kenneth G. W.	Christchurch.
Stoakes, Benjamin Maidens	Boston.
Sweetman, Robert	Warwick.

MODIFIED.

Allsop, George Walter	Birmingham.
Argue, James	Yeovil.
Biggleston, Edwin Radford	Exeter.
Bond, Edward	Reading.
Bond, John	Okehampton.
Chapman, Josiah Thomas	Hulme.
Clement, John Radford	Ashton-under-Lyne.
Day, John Charles Thomas	Clifton.
Harvey, Henry	Wakefield.
Owen, Robert Henry	Rhyl.
Passingham, George William	London.
Philpots, George Payne	Leyton Green.
Pratt, Thomas Henry	Newbury.
Richardson, Alexander	London.
Simms, Robert John	Burnham.
Snell, Charles Henry	Plymouth.
Wavell, Edward	London.
Wigginton, Henry Beecher	Liverpool.
Wilson, Clement Fisher	Bury.

The following were appointed Local Secretaries to the Society:—

Bideford	Thomas Hogg.
Belfast	Oswald A. Reade.
Frome	Wm. B. Harvey.

Resolved—That Mr. L. S. Hughes be re-appointed Collector for London and suburbs for the ensuing year.

A member having paid the arrears of his subscription, together with the usual fine imposed, was restored to Membership.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Second General Meeting of this Society was held on Friday evening, Nov. 11th; the President, Mr. Atherton, in the chair.

Various donations to the Library and Museum were announced and a vote of thanks recorded to the respective donors.

Five new Associates were proposed, after which Mr. Mayfield read his Introductory Address to the students of the Pharmacy and Materia Medica Class.

The Third General Meeting of the Association was held in the rooms of the Society on Friday evening, the 16th Dec., the chair being filled by Mr. Fitz Hugh, the Vice-President.

Members only were invited, many of whom were present. The election of the five candidates proposed at the last meeting was unanimously carried.

Mr. W. H. Parker proposed certain suggestions for the immediate formation of a museum, which was at once agreed to by the following gentleman undertaking to supply specimens as under:—

Barks	Mr. Fitz Hugh.
Seeds and Fruits	„ W. H. Parker.
Leaves	„ White.
Gums and Gum Resins	„ Mayfield.
Some dried specimens	„ J. S. Jenkins.

Afterwards Mr. Potts exhibited and explained various pharmaceutical novelties.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Third ordinary Monthly Meeting of the Session was held in the Memorial Hall, Albert Square, on Friday evening, January 6th. Tea was served at seven o'clock, after which the chair was taken by Mr. W. S. Brown, the President.

The following donations were acknowledged:—The *Pharmaceutical Journal*, weekly, from the Society; the *Pharmacist*, from the Chicago College of Pharmacy, U.S.; Dr. Thorpe's 'Chemical Problems,' from the Author.

Mr. Louis Siebold, Lecturer on Pharmacy in Owens College, then delivered an interesting address on the subject of "Pharmaceutical Examinations." A resolution was afterwards passed, requesting Mr. Siebold to prepare his lecture for publication in a substantial form.

A paper by Mr. Hampson "On the Importance of some Knowledge of Anatomy and Physiology to the Pharmacist," was announced for the February Meeting.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture IV.—continued.

In the process of making wine, there are a considerable number of operations which are occasionally considered rather extraneous to normal wine-making, and are by many persons classed amongst frauds. Materials are sometimes used in aid of the natural constituents of the grape-juice, materials which contribute to the quality of the product; some of them by adding materials to it, but others simply removing from the substances bodies which are not wanted in it. And I must say that it does appear to me a great error to object to the introduction of any new conditions which may be found to effect an improvement in the product. I do not think it is reasonable to suppose, because wine is only known by the vulgar as fermented grape-juice, that for that reason nothing but grape-juice ought ever to be used in the manufacture. I think it would be desirable—in fact, it ought to be almost compulsory—that persons should state what materials are present in substances which they sell to the public; but, I think, with that safeguard, it would be right to leave manufacturers perfectly free to employ whatever materials they might find most conducive to the elaboration of their products. In some countries, grape-juice is exceedingly rich in acid and poor in sugar (and I think a good deal of wine is rather of that class), and wine-makers in such districts find that their stuff is more drinkable if some of the acid present in it can be removed before it is sent out. They therefore put into the must, in fermenting the wine, some chalk, and the lime which is present in the chalk combines with the tartaric acid and takes it out of the liquid. Thus, the sour liquid is rendered less sour, and certainly that is not, in any degree, or to any extent whatever, a fraudulent admixture. Nothing is added, but only an unpleasant substance is taken from it. It also happens in precisely the same districts, that from the paucity of sugar which is present in the grape-juice, the wine is too weak in alcohol; and that to meet the requirements of consumers, many wine-makers now add sugar in the process. Now sugar is one of the natural and proper constituents of grape-juice, and if the grapes contain too little of it, it does seem quite proper and desirable that more should be added. However, in the subsequent making of wine, there are several other processes which are less natural than these, and about which some greater difference of opinion may possibly prevail; and one of the commonest, not only amongst wine-makers, but also amongst wine-consumers, is the process of fining. In order to establish the effect and the meaning of this process, I think we must trace back the history of wine from the time in which it is first put into casks by those who produce it to the time at which it gets into the hands of consumers. It is customary—I cannot say whether it is universal or not, but I believe it to be so almost—to put new wine into new casks; and in the better districts oak casks are used. New wood is far more porous than old wood when used for such a purpose; and of course the wine, when put into the cask, sinks into the wood, so that the outer surface is moistened, and allows some of the water and alcohol, and the various volatile materials to evaporate. In fact, the wine diminishes during the first year of keeping in wood very rapidly, by a process of evaporation. But this is not all. Whilst the water and alcohols are evaporating from the outer surface, air is dissolved by the liquid which is in the wood. Air actually diffuses itself through the wet wood into the body of the wine in the cask; and what is more than this, the water and alcohol which go out are replaced by something. The cask does not collapse, nor is there a vacuum produced above the liquid. The wood is always sufficiently leaky for air to come into it, and there is always a space left above the wine. Wine-makers are, therefore, in the habit of filling up their wine-casks periodically. In some districts in France, they are filled up in the first year three times, at three different periods; and, in the second year, they are filled up only twice, but only at perfectly definite periods or seasons, which have been found, for those particular wines, to be most advantageous. But each time the wine, if examined carefully, is found to have undergone, not only what we chemists should call a process of concentration, the solid substances dissolved in the liquid of course always remaining behind, the proportion of liquid being diminished, but, at the same time, it has undergone other changes, that is, there is a deposit formed from it. Some of the bodies present in it, either by themselves or by forming compounds with others added to them, form a sediment, and in the wine-growing districts it is customary, and I have no doubt necessary, to decant the wine and pour it off carefully from the deposit many times, for the presence of the deposit, if continued in the wine, would be injurious to the future changes which it has to undergo. When this comes into the hands of the consumer, there is suspended in the substance of the wine some of this deposit,—some solid particles which might be got to settle down, but which could not easily be removed completely by any process of mere subsidence, and the processes of fining, which are exceedingly various, have for their object the more complete removal of these solid particles by forming compounds with them. In some cases, the process consists in forming what I might call a sort of mordant, or something like a process of dyeing, in which a gelatinous compound is formed in the body of the liquid, which carries down with it a good deal of colouring matter, which it encloses, and which does, while going down, take with it a number of little filaments and cells which were floating in the liquid, and which were so exceedingly light that they would not have settled and could not have been removed otherwise. This point is particularly important in relation to a process which I shall presently mention. In some cases, it has been thought the wine contained too much albuminous matter. The theory of fermentation which was held for a long time, and which we considered at one of our previous meetings, consisted in attributing the process to the decomposition of the albuminous matter which is present in the fermenting liquid. It was supposed that there was too much of this albuminous matter present, and that it remained and was inclined to do further work. One process which has been adopted to a considerable extent in the champagne districts, where that was supposed to occur, consisted in adding tannin, a substance which I have already spoken of, which carries down a good many albuminous bodies, forming a precipitate with them, and with these no doubt carries down the solids which may be in suspension. Then another process, which really bears a considerable resemblance to this one in principle, although not in form, is that of sulphuring, using sulphur in the casks, which, of course, you would understand at once, exerts an antiseptic action. It is, in fact, a process which consists in producing a material which is, in plain English, a poison to any germs which may happen to be present, whose action must consist, as far as it goes, in arresting the vitality,—in stopping any work which they were doing. M. Berthelot, who has made many accurate experiments regarding the composition of wine and the changes which it undergoes, subjected some wine to the action of a known quantity of air, and by examining the wine afterwards he was led to the conclusion that air is an unmixed evil to wine when once it is fully made. There are certainly many general observations which everybody must have had occasion to make which agree with that. If we open a bottle of wine and use half of it, especially if we leave a bottle of light wine open for some little time, everybody knows that it deteriorates in quality, and becomes flat, or even sour. In a great many cases, it is found that there is a development on the surface of the wine, and if you were to examine it carefully you would easily see, especially in light French or German wines, a pellicle—in fact, the vinegar cells; and their presence must have the effect of promoting the oxidation of the wine. M. Berthelot's experiments confirm the general observation, which everybody makes more or less definitely, that air is noxious to wine when present in any quantity. But M. Pasteur has arrived at precisely the opposite result. I do not mean to say that he says air cannot do harm, but that what is hurtful in air is the excess of it, or the too rapid rate of its action. He lays down the principle that every ripening of wine, or the process by which young and crude wine is changed into good old wine, consists in a process of slow oxidation; that is its very essence, and that without that, a crude young wine cannot be mellowed or transformed into a good old wine. The evidence which he gives for his conclusion is exceedingly simple, and I must say it appears to me exceedingly conclusive. He has, for the purpose of keeping wine with air, and for the purpose of keeping it without air, resorted to appliances which are far more effectual than those generally resorted to in common life. You may be aware that a cork, even what we should consider a good cork, does not completely prevent the communication of external air with liquids in a bottle. I do not suppose many people can know how much air passes in and through a cork, but the quantity is very great. M. Pasteur sealed up some young green wine, by putting it into a glass vessel, and then he melted up the neck, so that he had no air present with it. He then kept it for a considerable time, and he found that this wine, even after years' keeping, was as green and as young as at first; that wine kept under conditions such as that air could have no access to it did not undergo, to any extent, the change which was wanting, and that it did not improve by keeping. He then sealed up, in a similar vessel, some wine with air, and he subjected the wine, with a known quantity of air, to various influences which were calculated to accelerate the action of the air upon it, and amongst these I ought specially to mention that of light. He took some small vessels made of perfectly clear glass, and sealed up his wine, various qualities of it, in these little vessels with air, and then exposed them to the sunshine in the south of France. He found that the oxygen of the air was totally dissolved, and that, when he examined the air, the oxygen had gone, but he found that his wine then did pass over rapidly into a state exceedingly like that into which it passes by the ordinary process of keeping in bottle. It lost its harshness, and became like old wine, which it resembled very greatly in its quality, and also in its composition the older kind of wines. At the same time, he found that there was formed in such quality of wine a considerable amount of deposit, and his explanation of the way in which oxygen acts so as to improve the quality of the wine, is this, that it serves gradually to take away from the wine various substances which are present in it, and that the deposit is due to an oxidation of the colouring matters present, which have an unpleasant, astringent, harsh taste, and it also consists in acting upon the alcohol of the wine and upon the various organic liquids in it in a similar manner. This result is certainly one of very great importance; for if the process of improving wine requires the action of oxygen, and if, on the other hand, the action of oxygen may do much harm,—I mean if all the good has to come from the oxygen, and if all the worst evils come from oxygen,—and that really is the position in which the question stands upon our present evidence, it must be of the greatest importance to ascertain what are the conditions under which the beneficial action can be exercised, and what are those under which its detrimental influence occurs. In that respect, both of the observers I have mentioned, and others also, have established some remarkable facts, but in order to appreciate them duly, it will be necessary for you to know something of the general character of compounds to which I must now make allusion. When we were examining the process of oxidation, I spoke to you of alcohol as a substance eminently capable of undergoing oxidation, and showed you how readily it could be burnt to a much smaller extent than that to which we are in the habit of burning it. I had to mention ordinary acetic acid as being a product of a shorter combustion. Here is a vinegar-plant which is oxidizing under alcohol, and there is an intermediate body which I have not yet spoken to you about specially. Here in this, I have some of it dissolved in alcohol. It is a substance which, in the strong state in which I have it here, has rather a sickly odour, and it was named by Liebig, to whom we owe some of the first and most accurate facts in relation to it, aldehyde, a name serving to recall one of the most important facts about it, viz. that it is alcohol from which hydrogen has been taken away. If you were to take away from alcohol some of its hydrogen, you would have aldehyde,—it is alcohol minus one-third of hydrogen, and it is, therefore, alcohol de-hydrogenized, and that is the origin of the term. When wines are undergoing very slow oxidation, it appears that aldehyde and other bodies analogous to it are formed. A great deal of evidence has been adduced of this, but I ought to mention that as yet one link in the chain of evidence is wanting, which chemists are always anxious to get in proof of their conclusions, that is, the substance itself, in a pure state, has not been obtained from wine. Still, the proof is so far conclusive that we are prepared to admit it provisionally. One fact which I mentioned to you just now is very remarkable, as part of the evidence, viz. that wines which are particularly good, either by keeping or by their own composition, combine with oxygen which is dissolved in them. Now, aldehyde is particularly greedy of oxygen. If you were to dissolve in the aldehyde in this bottle some air, and if you were to try to get the air out of the alcohol again, you would find that you could get the nitrogen of the air out again completely if you went properly to work, but you could not get the oxygen out. The oxygen is laid hold of and digested so rapidly by the aldehyde that it is no longer to be recovered, after even a very short interval of time.

I might show you one case of the avidity with which this aldehyde absorbs oxygen. On putting into a glass a solution of nitrate of silver, and then adding a little ammonia, we should find, on pouring into it a little of this aldehyde dissolved in oxygen, there would be a deposit of metallic silver around the inside of the glass. This is a very common and easy way of ascertaining whether in a mixture any body of this class is present. The ammonia liberates the oxide of silver from the nitrate, and the aldehyde acts by taking away the oxygen and precipitating the silver, and in this way we get evidence of the greediness with which aldehyde takes up oxygen. There are several other interesting reactions of this aldehyde, and amongst them I ought specially to mention one which was discovered some few years ago by some very distinguished Itatian chemists, the action of which is most exact and clear for removing aldehydes from any substance in which they are present; that is, their combination with alkaline bisulphites. This common aldehyde, and every body of the same class, combines with bisulphite, and forms very definite crystalline compounds, by which they are very easily detected and removed.

When we oxidize alcohol very slowly and gradually, we are able to get aldehyde formed from it; and, in the ordinary process of keeping wine, when it undergoes that slow oxidization which Pasteur affirms to be the proper process, aldehydes are proved to be present in it; but, together with them, there are a considerable number of other bodies, which we are in the habit of calling ethers. I have spoken to you already about some ethers; for instance, the compound which sulphuric acid forms with alcohol, that is a kind of ether, although it is not one of the bodies we are commonly in the habit of so describing. Ethers represent a class of bodies which are certainly amongst the most pleasant of chemistry. I have a good many here; one is the commonest of all; it is the ether which is, I believe, present, to judge by the flavour at any rate, in the celebrated *Lachryma Christi*. It is a body which I might describe as a salt. It is a salt formed whenever hydric acetate, the hydrogen salt of acetic acid, is present for a sufficiently long time in alcohol. Whilst the alcohol of the wine is becoming oxidized, and whilst aldehydes are being formed from it, there is also formed some acetic acid, and also probably some valerianic acid, butyric acid and others analogous, which are formed by the oxidation of the bodies present with the alcohol. All these acids, while undergoing the process by which they are formed, combine with the alcohol and bodies like it and form these ethers; and it has been already shown that, at all events, in some cases the aroma of the wine is dependent upon the presence of bodies of this kind. One of the most remarkable processes of manufacture of bodies of the kind which has been successfully performed of late, is the process of preparing artificial ether, for the purpose of imparting to alcoholic liquids the same flavour, aroma, or bouquet which they are found to possess when made from the same natural substance; for instance, oil of brandy is got from the skins and seeds of the grape which are left when the grape-juice has been pressed out. They are fermented, and a quantity of alcohol and aromatic substances are formed by the fermentation, and this forms the so-called oil of brandy, which is used for making brandy artificially; that is, common corn spirit is flavoured with it, and sold as genuine cognac. In like manner, various kinds of these acids have been made, and there is now in Germany a manufactory for making butyric acid on a large scale from sugar; it is then made into this ether, which is a very fragrant substance, and then in small quantities it is used for flavouring various alcoholic liquids, in imitation of natural products which naturally would possess the same substance or a similar one in them.

(*To be continued.*)

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 9 P.M.
WEDNESDAY...*Society of Arts*, at 8 P.M.—"How Meat is Preserved." By R. Jones.
THURSDAY ...*Royal Society*, at 8.30 P.M.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.
Royal Institution, at 8 P.M.—Lecture by Dr. Odling.

Parliamentary and Law Proceedings.

SUPPOSED MISTAKE.

At an inquest upon the body of Bartholomew Hodgkinson, a joiner, living at Preston, a certain amount of doubt arose as to the composition of a pill that had been administered to him.

The wife stated that deceased had met with an accident while at his work by which his leg was broken. Mr. Lund, of Manchester, attended him but prescribed no medicine. The only medicine he took was prescribed by Dr. Haldan. On the night before his death he took a pill and went to sleep and never woke afterwards.

Dr. Haldan said that he attended the deceased, who was suffering from a compound fracture of the leg. He considered it a case of very great danger. At the end of a fortnight the pulse had risen to 144. On the suggestion of Dr. Spence a pill was given to the deceased, containing sulphate of quinine. Twelve pills were ordered, one to be given every four hours. He died the next morning, but the pill could not have had any effect one way or the other.

Thomas Sharples, assistant to Dr. Haldan, said that the pills were made, according to the prescription, of quinine and extract of gentian. There was about a grain and a third of quinine in each pill.

A juryman said it would be advisable to have the pills analysed.

The coroner said that he should not like to incur the expense of an analysis unless they thought one essentially necessary.

A juryman said that although he had not the least doubt of the doctor's fidelity, he thought that the pills might have been mixed improperly but at the same time not purposely.

At first there were eight jurymen in favour of an analysis to four against, but after considerable discussion a verdict was returned to the effect that the death had been caused by the accident.—*The Preston Herald.*

POISONOUS CONFECTIONERY.

Several traders have been brought up at the Southern Divisional Court, Dublin, on a charge of having used poisonous ingredients in the preparation of various sweetmeats. Sugarsticks of a yellow colour were found to contain chromate of lead; lozenges were coloured with vermilion (bisulphide of mercury), and other articles were adulterated with from 10 to 12 per cent. of *terra alba*, a form of fuller's earth, most injurious to children. Dr. Cameron, the city analyst, who had experimented on the different articles mentioned, suggested the employment of saffron and cochineal, both harmless substances, instead of the hurtful chrome and vermilion. The traders were fined, and had to pay all costs.—*Medical Times and Gazette.*

Lead Poisoning.—The fact that metallic ice-pitchers corrode very rapidly, especially the solder of the joints, having been noticed by Mr. S. Dana Hayes, of Massachusetts, he was induced to investigate the cause, when he found that such corrosion was due to the action of alkalies upon the sides of the vessel,—generally made of Britannia metal, German silver and copper,—by which a galvanic action was set up and the lead in the solder decomposed.—*American Chemist.*

Reviews.

INTRODUCTION TO THE STUDY OF INORGANIC CHEMISTRY. By WILLIAM ALLEN MILLER, M.D., D.C.L. Longmans, Green and Co. 1871.

A LABORATORY TEXT-BOOK OF PRACTICAL CHEMISTRY. By WILLIAM G. VALENTIN, F.C.S. John Churchill and Sons. 1871.

We are really gratified in being able to announce and welcome these two books. They come to us most opportunely, for they fulfil, almost as perfectly as if they had been compiled in that design, the desire which we have already expressed in the columns of this Journal. It has often appeared to us that the usual text-books set before young students of chemistry introduce far too much of technicality into their language and mode of handling the subject at the commencement; a character more progressive seemed to us desirable. The little introductory treatise now before us, the work of the late much-lamented Professor Miller, relieves us of a difficulty we have often been placed in when requested to recommend an elementary book. The opening chapter, describing the scope and aim of chemistry, is very good; but our readers will gain a better idea of the style and plan of the work from the following extracts out of the short preface, than from a description of our own:—

"This book is written expressly for beginners. In order that they should really understand the statements which it contains, it will be necessary for them to begin at the beginning, and to go straight through it. Among other reasons for adopting this course, it is to be noted that it is impossible to avoid the use of technical terms in discussing a scientific subject; since we often have to deal with matters for which no expressions are in use in ordinary language.

"The student is strongly advised never to omit the performance of any experiment which he has the means of making. No useful knowledge of chemistry can be acquired by any one unless he constantly makes experiments as he proceeds with the study."

In this last remark we concur heartily. In order to indicate the methods adopted, detailed directions for upwards of two hundred and fifty experiments, mostly of a simple nature, are dispersed through the book; but of course an intelligent lad, as he makes progress, will devise many others for himself.

It is a question which may occur to some people, whether it is advisable to commence so early the employment of chemical notation. We are, however, of opinion that it is decidedly an advantage to use it, in a simple form, from the very first; by doing so, the precision which ought to characterize all scientific work is constantly impressed upon the mind.

To render it complete, there should have been added at the end of each chapter a series of questions. We hope this will be thought of in a future edition.

We have much pleasure in cordially commending this little volume to all who desire to acquire a solid groundwork of general principles.

Those who wish to go a step further, and not only to master the fundamental principles, but to gain also an acquaintance with some of the details of laboratory practice, will do well to choose Mr. Valentin's 'Text-Book' as their guide. It forms a fitting sequel to that of Professor Miller. The idea upon which it is based is the same. The arrangement of the book, too, is similar; but the student is led further. He is taught, not only to make experiments, but to draw from them correct inferences; and from the facts which he thus learns, and the conclusions flowing from them, he is introduced to theory.

Mr. Valentin, of course, makes exclusive use of the system of notation introduced by Dr. Frankland and founded upon the notion of quantivalence or atomicity. This system is easily intelligible. The atom of any given element is found by experiment to be capable of combining with a certain number of atoms of hydrogen or of any other element, chlorine for instance, which can replace hydrogen atom for atom. Although this number is apparently variable for almost all the elements, yet in each case there is a maximum point at which the atom which forms, as it were, the nucleus, is *saturated*. Thus oxygen is certainly a *dyad*, because it combines with either two atoms of hydrogen, or with one of hydrogen and one of the *monad* potassium, or with two atoms of potassium. In caustic potash the hydrogen and potassium are held together by the intervention of the oxygen. The potassium and hydrogen alone have no power to unite. In water the two atoms of hydrogen are linked by the same agency. When such an atom as that of oxygen, which is multivalent, is supplied with a number of monad or univalent atoms or their representatives, which are insufficient to satisfy its combining capacities, the resulting group is unsaturated. It has a tendency to combine with other bodies which may complete its saturation. Thus although ammonia, NH_3, is capable of existing alone, it nevertheless has a tendency to combine with hydrochloric acid or some other body which is capable of completing the molecule. This is explained by saying that nitrogen is quinquevalent, and therefore is not satisfied with three atoms of hydrogen. Dr. Frankland distinguishes by thick type, the element which in any compound possesses the greatest number of what he calls bonds, that is, units of combining power. This same element is also, as a rule, placed first in the formula. Thus water is written $\mathbf{O}H_2$. Carbonic anhydride, which contains the quadrivalent element carbon, with the bivalent oxygen, is $\mathbf{C}O_2$. Trihydric phosphate, or common phosphoric acid, is, by the same rule, $\mathbf{P}O(HO)_3$ or $\mathbf{P}OHo_3$. Dr. Frankland's formulæ are therefore all constitutional formulæ, that is, they pretend to express not only the relative proportions of the elements in a compound, or even the number of atoms in the molecule of that compound, but the actual order in which its constituent parts are fitted together. Though it must be admitted there is already considerable foundation for such a system, it ought in the present unsatisfactory state of the science to be used with due caution and, we think, alternatively with one less pretentious. Whilst we fully admit the value of constitutional formulæ as helps to teaching we have no sympathy with any of the graphic systems which have been introduced, and we are glad to perceive that Mr. Valentin accords to them quite a subordinate position in his pages. We cannot help commending very highly the arrangement as well as the details of this manual, and the author's expressed desire to lead his pupils "to generalize and to systematize," seems to be very successfully carried out. In the part devoted to qualitative analysis, the methods recommended are, we believe, both practical and accurate. A number of well-devised questions follow each chapter.

In conclusion, we here record our conviction that Mr. Valentin's Text-Book is the best laboratory guide to practical chemistry at present in existence.

BOOK RECEIVED.

YEAR-BOOK OF PHARMACY: comprising Abstracts of Papers relating to Pharmacy, Materia Medica, Therapeutics and Chemistry, contributed to British and Foreign Journals, from July 1, 1869, to June 30, 1870, with the Proceedings of the British Pharmaceutical Conference at the Seventh Annual Meeting, held at Liverpool, September, 1870.

The following journals have been received:—The 'British Medical Journal,' Jan. 7; the 'Medical Times and Gazette,' Jan. 7; the 'Lancet,' Jan. 7; the 'Medical Press and Circular,' Jan. 11; 'Nature,' Jan. 5; the 'Chemical News,' Jan. 6; 'Journal of the Society of Arts,' Jan. 5; 'Gardeners' Chronicle,' Jan. 7; the 'Grocer,' Jan. 7; the 'English Mechanic,' Jan. 6; the 'Chemists and Druggists' Advocate' for December; the 'Chicago Pharmacist' for December; the 'Florist and Pomologist' for January; the 'Milk Journal' for January; the 'Journal of the London Institution' for January.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[6.]—ESSENCE OF COFFEE.—This is a highly concentrated infusion of coffee, prepared by percolation with boiling water, and then quickly evaporated to about one-third or one-fourth of its bulk. Sometimes it is mixed with a thick aqueous extract of chicory and syrup of burnt sugar, so as to give the whole the consistence of treacle. The proportions of the dry ingredients used should be—

Coffee . . . . 4 parts.
Chicory . . . . . . 2 „
Burnt Sugar . . . . 1 part.

It should be kept in well-corked bottles in a cool place.—COOLEY.

[81.]—SYRUP OF TAMARINDS.—In answer to your correspondent "*Medicus*," I beg to furnish the following recipe for a syrup of tamarinds:—

Tamarinds . . . . . . 100 parts.
Sugar . . . . 500 „
Orange-Flower Water . . 6 „

Boil the tamarinds for some time with a sufficiency of water; add the sugar to the resulting decoction, and clarify the syrup with the white of an egg. The orange-flower water should be added when the syrup is cool.—ALEMBIC.

[92.]—FLEXIBLE VARNISH.

India-rubber (cut small), 1½ oz.
Chloroform, Ether (washed), or Bisulphuret of Carbon, 1 pint.

Digest in the cold until the solution is complete. It dries as soon as it is laid on. Pure gutta-percha may be substituted for india-rubber.—X. Q. Z.

[101.]—CHERRY TOOTH-PASTE.—A very good cherry tooth-paste is made as follows. It has the advantage of not fermenting:—

R. Lap. Pumicis Levig.,
P. Iridis, ana ℥ij
P. Myrrh. ℥ss
Mellis ℥iv
Lake Liquor to colour.

When mixed, add—

Ol. Caryoph. ʒiss
Ess. Limonis ʒiss
Otto Rosæ gtt. viij. S. D.

[104.]—COUGH PILLS.

R. Antim. P. Tart. gr. iss
Ext. Hyoscy. gr. xviij
Morph. Mur. gr. ½
Pulv. Glycyr. q. s. ft. pil. xij.

Capt. j nocte maneque.—W. W.

[117.]—WATCH OIL.—Ol. Amygdal. Dulc. is the best for either purpose.—W. W.

[120.]—EMBOSSING STAMP.—*A. H. Hale* can procure the kind of Press he requires from any of my establishments.—W. MATHER.

[121.] SYRUPUS CROCI.

R. Croci Stig. ʒj
Aq. Bullient. lb. j
Sacch. Alb. lb. ij.

M. Infuse the saffron in the water for some time in a warm place, then add the sugar, and slowly simmer for a time, then strain. If to be kept, add a little S. V. R.—W. W.

[122.]—PERFUMED LIQUID AMMONIA.

R. Otto Rosæ gtt. ij
Ol. Lavand. gtt. xx
„ Verbenæ gtt. ij
„ Limonis gtt. xx
„ Caryoph.,
Ess. Moschi, ana gtt. x
„ Jasmin. gtt. vj
S. V. R. ℥ss
Liq. Amm. Fort. ℥iij. MEDICINA.

R. Ol. Lavand. Ang.,
Ess. Bergamot,
Ess. Limonis, ana ʒj
Caryophyll. ʒss
Camphor ℥ss
Ammoniated Alcohol ℥xij

M. Macerate for a week, and filter.—W. W.

R. Ess. Ambergris,
Ess. Musk, ana ℥ss
Otto of Rose ♏xx
Oil Lavend. ʒj
Ammoniated Alcohol ℥x

M., et adde—

Liq. Ammon. Fortis ℥x.—W. W.

[123.]—ARNICA CERATE.—*M. P. S.* would be glad of the proper form (if there is one) for making "Arnica Cerate."

[124.]—AFRICAN SAFFRON.—Can any one give information as to the source of the so-called African saffron?—X. Q. Z.

[125.]—SCIENTIFIC LIBRARY.—"*A Stranger*" would feel obliged to any one who could kindly inform him of a good library containing scientific and other works, and chiefly open at nights for reading.

[126.]—TEETOTALLERS' SYRUP.—Can any reader inform me what is the composition of the "syrup" used by teetotallers?—W. B.

[127.]—BURLING INK.—Can any one favour me with a recipe for "Burling" ink? It must be blue-black, and a great portion of the colouring matter in a dissolved state. Such an ink is used by clothmakers for marking any portion of cotton in the cloth that has failed to take the dye properly?—CONIA.

[128.]—AMANDINE.—*J. P.* would thank any of our readers who would furnish him with a good recipe for making amandine for whitening the hands and preserving them from chapping.

[129.]—TALCA GUM.—Will any reader kindly give me some information concerning the source from which talca gum is obtained?—STUDENT.

[130.]—GERMAN YEAST.—*G. W.* would be thankful for good directions for the manufacture of German yeast.

[131.]—MOUTH WASH.—*H. W. G.* would be thankful for a recipe for a good wash for the mouth, to be used as a remedy for soft and spongy gums.

[132].—COUGH BALLS FOR HORSES.—"*A Member*" is in want of a good formula for making cough balls for horses.

[133.]—CAMPHOR BALLS.—I should be glad to learn of a good recipe for preparing camphor balls for chapped hands.—RUSTICUS.

[134.]—BEESWAX.—Will any reader advise me as to the best method to be adopted in the refining and colouring of crude beeswax?—JULIUS.

[135.]—ESSENCE OF JARGONELLE PEAR.—*M. M.* wishes to be supplied with a formula for the preparation of the artificial essence of jargonelle pear.

[136.]—DISPENSING.—I should be glad to know how the enclosed prescription should be dispensed and sent out. I have dispensed it several times, but never to my satisfaction.

R Potassæ Chloratis ʒiv
Tinct. Ferri ʒiv
Aquæ ad ℥iij. M.

"One teaspoonful in water three times daily."

"SIGMA."

[*** The quantity of water ordered is not sufficient to dissolve the chlorate of potash completely.—ED. PH. J.]

Correspondence.

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

PROPOSED REGULATIONS FOR STORING OF POISONS.

Sir,—In the discussion on this subject several important points have not been touched upon; and, as it is now evident that the Privy Council intend something to be done, and that within a reasonable time, it would be wise on our parts to attend to it early, so as to prevent any further interference.

On a previous occasion, June, 1869, I advocated voluntary measures, but the time is now past for anything of that sort, and something compulsory must be agreed upon.

In my opinion we can easily gratify the public, without any inconvenience or much expense to ourselves, and it will be obviously to our interests to do so. It is more as a *placebo* to satisfy the wishes of our customers, who seem to have made up their minds about having some regulations of this kind, than for any other reason that further legislation is needed.

The Pharmacy Act, 1868, always appeared to me to expect further action by the Society; and I think we are under certain moral, if not legal obligations, to bring forward some scheme to be universally adopted.

There would be really very little difficulty in the matter if the regulations were confined to Part I., and to the sending out of poisonous applications in blue bottles or bottles covered with blue paper.* As to the argument that such precautions are not necessary, and that they ought, if compulsory, to apply equally to medical men, I attach very little weight to it, because every one who has had experience in the best dispensing houses knows that similar arrangements are there carried out, and also that medical men can, in many cases, avoid inquiry into their mistakes.

Good bold labels, and a separate compartment for all articles in Part I., and labelling lin. aconit. and belladon. for outward use to distinguish them from the tinctures, appear to me the measures best adapted to retailers; but to extend these precautions to articles in Part II. is only to bring ridicule on the Society and the whole trade. Let us all make up our minds to carry out fully some well-considered method, and, by sinking private feelings for the general good that would follow, we shall please the public and advance our interests as dispensers.

There is a growing feeling amongst the educated classes that medicines are better prepared by the chemist than the surgeon. If we can keep pace with the demands of the enlightened portion of the community for genuine medicines skilfully prepared, we can well afford to leave medical men free to do as they like.

Sandown, I. W. GEORGE BROWN.

Sir,—Although I cannot speak on the above subject from large practical experience, I have given some attention to the consideration of its bearings, both on the trade and the public, and am not at all surprised at the objections expressed in the Journal to the proposals of the Council. It is quite true, as "Nemo" observes in the number for Dec. 31, that cases of poisoning by "misadventure seldom" occur. But this does not, I think, show (as he seems to argue) that precautionary measures are not therefore requisite and advisable. The question is not whether such cases "seldom" occur, but whether they occur at all; whether anything can be done to prevent them. To my mind the question shapes itself thus: Has everything been done that can be done to prevent accidental poisoning by chemists? If not, then it is clearly a duty of the Legislature (and intermediately of the Council) to supply this deficiency. This is attempted in the present simple regulations, to which, I think, no chemist can reasonably object. They are not an infallible remedy against mistakes, but a further effort (in addition to qualification) to prevent them,—another link in the circle of duty which we owe, as a public body, to society.

"Prevention is" always "better than cure," but in cases of poisoning prevention is too frequently the only cure. The fatal draught once swallowed, no power, perhaps, can avert the sad results,—the loss, it may be, of a valuable life, and the ruin of the chemist, or at least the sacrifice, on his part, of a large sum of money, to say nothing of reputation. In how many cases would such results have been prevented by the rigid adoption of a few simple precautions like those now proposed? Let me select three "sample cases," in each of which, I believe, these precautions would have proved effectual. They are all recorded in the PHARMACEUTICAL JOURNAL for July, 1869, and each proved fatal. In the first of these, which resulted in the death of Mr. F. Grattan Guinness, it is next to certain that, had these compulsory precautions been in existence, the porter would not have filled the carbonate of ammonia bottle with cyanide of potassium. It is distinctly stated that "the jar had no label to it." It is true the assistant should have discovered the substitution, but the porter's error was the original cause of the accident, and would have been entirely met by the precautions now proposed. It was asserted at the inquiry that the rules of the establishment had, in this case, been departed from, and this fact clearly shows the advantage of uniform and compulsory regulations over those privately adopted. The former are far less likely to be neglected than the latter. To the second case referred to, which involved the death of Essex T. Williams, surgeon, a similar line of remark is applicable. Had the strychnia sent out by the "wholesale house in Bristol," in mistake for acetate of morphia, been originally prominently distinguished, it is hardly possible to suppose that it would have been supplied in error for the latter substance. The third case, in which strychnia was substituted for sugar, still more strikingly exhibits the value of precautionary measures. A chemist, who had on the very day of the accident, entered on a business, dispensed strychnia for saccharum. The chemist who had sold the business alleged that the labels had been mistaken, adding, "It was not customary for chemists to label their bottles 'Poison' in addition to the ordinary label as to the contents." It is clear enough that this mistake would not have occurred had the bottle containing strychnia been in some way distinguished from the rest. A parallel case to the above, in which strychnia also proved fatal, is recorded at page 728 of the PHARM. JOURNAL (Vol. XI.). In this case a surgeon dispensed the medicine. It was, however, stated on the inquiry that the surgeon "was not aware that there was any strychnia in a crystalline form in his surgery," and that "the bottle containing the poison was not properly labelled." The above cases (and, did time and space permit, others equally in point might be cited) show that poisoning by "misadventure" does not occur so "seldom" as could be wished, but quite often enough to render some restrictions necessary. Practically they suggest that the same or similar regulations should be applied to wholesale druggists and surgeons, as to dispensing chemists.

Such cases also furnish a reply to the observation of "Pharmaceutist" (page 537), "that the improved education now demanded is a sufficient safeguard to the public." Such a remark is altogether beside the question. If only educated, pharmaceutists and scientific men had the handling of poisons, restriction might be less necessary, but as we see in the case of Mr. Guinness, and as every one in the trade knows, these substances are constantly being manipulated by apprentices or porters, who are for the most part imperfectly educated, and the same remark will apply, probably, even to not a few assistants. The fact is, the qualification of the principals in Messrs. Oldham's establishment was far less capable of preventing the accident above referred to, than a few simple rules, regarded by all as compulsory, would have been. The same observation will apply in the case of mistakes which have occurred in other houses of the highest standing in the trade. Clearly enough qualification may have nothing to do with the matter. In neither of the above cases, where the principals made the blunder, was any question whatever raised respecting qualification. The present regulations are designed to meet sources of error against which no degree of qualification could render a man absolutely secure, either as regards himself, or especially as regards those in his employ. Education and a sense of responsibility, so far from rendering us independent of rules, teach us to frame good ones, and willingly and rigidly to abide by them.

Let me ask, in conclusion, how would these regulations, if adopted, practically affect the trade? Do not the alternatives

* As stated by the Editor in a recent number, this last is very important, for it will be found on examination that most of the accidents occur through mistakes or neglect of patients or attendants.

now offered and the suppression of the restriction touching liniments and angular bottles, so simplify them, as to render them generally applicable? The trade may, I imagine, be divided, as regards this question, into three sections. First, there are houses probably where these or similar regulations for storing poisons are already in force; this, we may presume, is the case in our principal metropolitan and provincial dispensing establishments, and here no material difficulty would be experienced. There is a second class who have virtually embodied these regulations in certain precautionary measures of their own, and such would willingly conform to those officially proposed. A third section still remains, not, I think, the most numerous, and certainly not the most influential, who have not adopted precautions of any kind in keeping poisons, but who (as Mr. Slipper naively observes), "If they find the bottles containing crystals of citric acid and sal. acetos. hugging each other, naturally and prudently(!) forbid the close connection." Such chemists "know better" than to be bound by a "hard and fast line." They act upon their knowledge and experience. Perhaps the instances given above will serve to show that the *laissez faire* policy, which this section of the trade so strongly advocates, is directly subversive of its own interests, as well as of the interests of the public, and help to explain the reason why the Council think it necessary to compel chemists to keep poisons in certain places or in distinctive bottles. From this section of the trade opposition must be expected, and ought to be vigorously met. But by a free and full discussion of the matter in the pages of the Journal, it may be hoped that many who at first opposed these regulations, will be led to see the advisability of adopting them.

Objections have been raised to the compulsory nature of the proposed regulations, but to be generally effective, I hold that they must be compulsory. This is evident from the existence of a section in the trade opposed to them (and which would still exist if reduced to a minority), and also from the fact that their effectiveness must largely depend on their faithful application by apprentices, assistants, or porters, on whom rules legally binding, would naturally have a greater hold than regulations merely recommended by the Society or enjoined by their employers. It might, perhaps, greatly facilitate the adoption of the present regulations, if the Society could devise and authorize a label to be stamped, "The Pharmaceutical Poison Label," and bearing the word "poison" in the centre in distinctive type; such label, exhibiting some bold device which would be at once recognized, to be made both in paper and metal; the latter form with holes for nails or string, to enable it to be conveniently affixed to casks or jars. If made in different sizes, the smallest bottle or pot or preparation of any kind, could easily have one attached. The value of one uniform safeguard label, universally understood and recognized throughout the trade, will be at once evident to all. I have said above that the proposed regulations should apply to wholesale druggists and surgeons as well as to chemists. Nor do I see why they should not or cannot; but if their extension to medical men and the wholesale trade involve any practical difficulty, this is certainly no reason why chemists should reject them. Shall we refuse to adopt a course suggested by prudence and warranted by reason and experience, merely because our neighbours won't? Let us set them a good example.

January 7th, 1871. M. P. S.

P.S. The use of the label above suggested, would probably be considered to meet the requirements of the second alternative regulation, applicable to articles which cannot be conveniently kept apart, especially if the label were made of sand-paper or other rough material, so as to be distinguishable by the touch. In the case of metal, a few holes punched in it would answer this purpose. Let me add, that it is quite possible that many chemists whose own arrangements are excellent, may, nevertheless object to compulsory regulations, but surely they are inconsistent with their own practice in doing so. I have just read Mr. Allman's letter in to-day's Journal and would here endorse his excellent remarks (as also those of "A Pharmaceutical Chemist" in the Number for December 24th). Mr. Vizer's reference to the "knives and lancets" is a pure absurdity. It is, however, important as touching Mr. Proctor's suggestion, that the regulations should be as simple as possible, otherwise they will be evaded. A rule too complex to be undeviatingly observed is worse than none. This question deserves, in my opinion, far more serious and dispassionate treatment than it has received in the letters of Mr. Beaton, Mr. Hampson, Mr. Vizer and other correspondents.

Sir,—In common with the majority of your readers, I have taken great interest in the discussion that has been kept up with so much spirit and, in the main, with such good sense.

We now stand in a different position respecting the question; the Council are not to have it all their own way. Much as I respect several individuals of that body, I should feel wanting in honesty did I not express my convictions upon the great topic. I have hitherto deferred doing so, but the letters of Messrs. Beaton, Hampson and Allman have brought me to bearings; the two former gentlemen fairly represent the gist of the whole affair, and advocate the dignity of our profession (if it be ever destined to such honorary title).

Presuming the object of Government to be the protection of the lives and health of her Majesty's subjects, there is ample scope for such benevolent intentions:—

1st. By commencing a system of practical sanitary reform.

2nd. By regulating the supply and quality of poisonous compounds by publicans and others.

3rd. By placing under strict surveillance unscrupulous and irresponsible railway directors, who sacrifice human life and limb with so much *sang froid.*

4th. To try and get hold of the fact (if it exists) that people can be made moral, careful and intelligent by Acts of Parliament for the prevention of such as the three cases of poisoning recorded in last week's Journal.

I can but repeat what has already been shrewdly advanced, that the intelligent chemist does not need legal intervention to keep him in the knowledge of the substances he makes and handles, any more than the accomplished surgeon requires watching as to how he operates with his knives and lancets,—the idea is preposterous and impertinent.

Mr. Allman's letter being chiefly personal, does not admit of remark, further than the acknowledgment that as a specimen of special pleading, it deserves the palm.

R. Goodwin Mumbray.

Pharmacy in Brighton.

Why do not the Pharmaceutical Chemists here study more the interests of their assistants, since the examinations of the Pharmaceutical Society have become so rigid? In this town, where we have more than fifty chemists in business and, on an average, two assistants in each shop, there is not either a school of pharmacy or any place where we can receive instruction. Why does not the Pharmaceutical Council appoint Local Secretaries, not merely for the purpose of conducting a preliminary examination (which is of no use to assistants), but also that they might exert themselves—particularly in a town like Brighton—to establish, with the help of their brother pharmaceutists, a school, or at least some place where assistants could meet for the purpose of instruction in the several branches of the profession? It is not every assistant who has money to repair to the great metropolis, and give his whole time to a pharmaceutical education; whereas at home he might get away one evening in the week and pay a fee for a course of lectures. I am sure if our Pharmaceutical Chemists were to exert themselves to establish a school of pharmacy, it would be strongly supported by the assistants in general.

A. Henley Attwater, Jun.

Wholesale Druggists' Assistants' Society.

Sir,—Concerning my abortive attempt to get the assistants in the wholesale drug trade to form themselves into a Mutual Improvement Association, allow me to remark that it took place as far back as the spring of 1867, and was prompted principally by seeing the rapid improvement which had for years been going forward in the ranks of the assistants in the retail trade, while the assistants in the wholesale trade were gradually sinking in the social scale, if we may judge from the fact that their employers found it necessary to look about for some means of protection against their delinquency. I need hardly allude to the difference which has always existed in the position of the wholesale and the retail druggists' assistant. While the latter are men who have passed through a regular apprenticeship, and for the most part reside with their employers, having access to the various works and journals appertaining to their calling and time to study them during the intervals of business, the great bulk of the former have never had an opportunity of pursuing any course of study; and, being engaged at business during fewer hours of the day, they are constantly employed at set duties, which allow them no time for reading during those hours. After business hours few, at present, have the means of acquiring that knowledge, which would be so easily attainable if there were a reading-room and library to which they could resort at any hour which suited their convenience. The periodical trade literature would cost but a trifle annually, and I know by past experience that the nucleus of a library is soon formed by donations from authors, publishers and employers, added to subscriptions got up among the members. It is also known that several of the *employés* in the trade are men whose attainments are such as would not fail to be most useful in the enlightenment of their less favoured brethren, could they be prevailed upon to join in the exposition of the useful trade and scientific knowledge which they possess.

Having communicated my idea of the desirableness of such an institution to three acquaintances holding a similar position in the trade to my own, it was determined that each of us should submit the following to his own private circle as the primary objects of a proposed Society, but our personal canvass was so very unsuccessful that the matter was abandoned after the second meeting at my private residence.

1st. To enroll any member of the wholesale drug trade who had been employed in any drug house for a period of five years as an associate of the Society, and to provide, in return for a small monthly subscription, a meeting and reading-room, to which every associate would have access at any time.

2nd. To institute a series of readings by those members of the Society able and willing to contribute articles of trade interest.

3rd. To facilitate the acquirement of trade knowledge by opening a register, in which any member might request the advice and information of the other members on any subject connected with the trade.

4th. To keep a record of all vacancies occurring in the trade, and to furnish employers with a ready means of at once selecting servants suitable to their wants.

5th. To undertake to expose and prosecute any dishonesty on the part of any of its members.

I may set down the failure of the movement—(1.) To the difficulty of getting a sufficient number of co-operators to promote it, by throwing in their energies and the small advance of cash (a few shillings each at most) necessary to set it going. (2.) An expression of fear that employers would misconstrue the aims of such an undertaking (3.) An apparent feeling of rivalry between the men of the various wholesale houses.

In making the above hurried jottings of what was a private effort to do good, I write in the hope that some one may now come forward with sufficient energy to ensure the success of so desirable an institution.

88, *Campbell Road, Bow,*
27th Dec. 1870.

O. Davies Owen.

Druggists' Charges.

Sir,—Having seen much in the Journal lately concerning the above, I beg to lay before your readers the state of things not many miles distant from Hull. Two cases have recently come under my notice I think worth making known. In the first, a 3 oz. bottle of drops was dispensed at a chemist's, and charged 2*s.* 6*d.* On taking the prescription to a Pharmaceutical Chemist by Examination, the patient was asked what had been the former charge. The reply was 2*s.* 6*d.* To which the pharmacist replied, "Oh! but we will let you have it for 9*d.*" There can only be one inference drawn from this, either that the chemist was actually a loser by the transaction or that the patient was the sufferer. The second case was that of an 8 and 6 oz. mixture, dispensed and charged respectively 2*s.* and 1*s.* 8*d.* The lady looked rather astonished, and was asked if she had paid less, the answer being that she had been charged 9*d.* each, but on going the second time was informed that they could not make them up again for the same price; the charge must be 1*s.* 9*d.* the two. The lady added that she did not mind giving more for them, providing they did her more good than the last, which had not done her any good. This was not to be wondered at, seeing that the bare retail price of the ingredients came to about 2*s.* 6*d.* for both bottles. If this state of things continue, I see no chance whatever of the rising generation of young chemists making a living.

One of the Rising Generation.

Obscure Prescriptions.

Sir,—The following enigmatical recipe was brought, some years ago, to a shop in a country town within fifty miles of London, to be "made up." I secured the original, of which I give a copy *verbatim et literatim*:—

Oil of koors ham
Oil of hope ham An
Oil of Anni seed
Oil of St. eppes.

The above recipe was distinctly and carefully written, but except the aniseed, we were unable to identify the ingredients. If "hope ham An" mean opium, the "oil" is still perplexing; the other ingredients seem quite apocryphal. The purpose of this mixture was to mix with food for cattle; the proportions being left to the judgment of the chemist, and it was judiciously compounded accordingly; not, however, without a shrewd suspicion that it was designed to excite in certain specimens of the equine race an unnatural taste for "Chaff," to the possible advantage of some preternaturally clever, but not overscrupulous "Johnny."

January 6th, 1871. F. D.

The Library.

Sir,—I have of late frequently heard the question asked by students at Bloomsbury Square, if it were not possible for the Library to be kept open an hour or two longer. If it were closed at eight o'clock, instead of six o'clock, as at present, I think it would meet the approval of the students generally; many of whom would gladly avail themselves of the advantages there offered, which they cannot obtain elsewhere. I would ask the Council, on their behalf, to take the matter into consideration.

I would also invite the opinion of gentlemen interested in the Monthly Evening Meetings, respecting the time fixed for their commencement, whether or not it is the most convenient for the majority of members and others? I know many gentlemen state they should attend much oftener, but being compelled to be home at a certain time, they are generally under the necessity of leaving before the conclusion of the meeting.

Dec. 12th, 1870. Student.

[*** Formerly the library was kept open as our correspondent recommends, but this arrangement was given up in consequence of the small number of readers using it in those hours. We would recommend "Student" to forward any suggestions he may have to make on the subject to the Council.—Ed. Ph. Journ.]

"*Indoctus*" (Bolton).—Cooley's 'Cyclopædia of Practical Receipts' may be obtained through any bookseller.

G. R.—The label sent would require to be stamped. Every reference to dose and medical treatment must be omitted.

D. Y. N. (Barnsley).—We do not undertake to give advice as to the study of midwifery. Our correspondent had better apply to the editor of one of the medical journals.

We have received, enclosed in a note from Southampton, the initials to which appear to be H. M., a contrivance by which a simple india-rubber band is used to secure the stopper of a poison-bottle after it is withdrawn, and so to attract the attention of the dispenser.

T. C. (Sheffield Moor).—We are obliged for your communication, but, as it stands, it would appear too much like an advertisement of a particular maker's preparation.

"*Alpha's*" wants will probably be supplied by the pump, unless he is joking.

"*Medicina.*"—The question as it stands is too vague for insertion.

Messrs. Coates and Walker.—The letter and stamps have been handed to the publishers. To secure insertion, all advertisements should be sent direct to Messrs. J. and A. Churchill, New Burlington Street.

Communications, Letters, etc., have been received from Mr. A. W. Bennett, Messrs. Cox and Co. (Brighton), Mr. J. Ince, Mr. H. J. Owen, Mr. S. R. Atkins (Salisbury), Mr. J. M'Cann, Mr. W. W. Stoddart (Bristol), "Conia" (Leeds), "Indoctus," "F. D.," "M. P. S.," "S. D." (Bow), "H." (Heckmondwike), "W. F. C." (Buckley), "E. F." (Folkestone).

PRESCRIPTIONS FOR PROVINCIAL ASSOCIATIONS.

BY JOSEPH INCE.

Some misunderstanding seems to prevail in the minds of students relative to this matter; they fear that the introduction of foreign formulæ in each assorted volume, may suggest eventually a catch examination question, or prove a trap to snare. Let me then say precisely what is the intention of this second (Provincial) collection. Two-thirds of each compilation are filled with general recipes, the reading of which will facilitate the knowledge of autograph prescriptions—the remaining third consists on purpose of specimens of pharmacy other than English—these serve as reference, or as things of literary curiosity and may prevent a pharmacist from sinking his existence in his immediate surroundings.

During the past week the following collections have been forwarded. I. (10), II. (38), III. (9), A. W. Gerrard, Guy's Hospital. From Preston a collection of twenty years by Thos. Dawson has arrived.

Amongst those received are some which seem to indicate a pharmacy differing from our own.

I.

℞ Extrait de Belladone, deux gros
Unguent Napolitain, un gros
Graise fraîche, une once
Tinture de Benzoin, un gros.
M.
Dec. 3, 1868. G. M.

Suppose the plan of direct teaching be adopted, then how this ordinary French ordonnance rises into importance! What is a *gros?* is Unguent Napolitain, correct? is Graise the correct spelling? how in French would you write Tr. Benzoin? what, according to the Codex is the composition of Ext. Belladonnæ, Onguent Napolitain, and Teinture de Benzoin?

II.

Donner à l'enfant une cuillerée à bouche de la potion suivante de 4 en 4 heures.
℞ Sel de Seignette, 30 grammes
Eau de Laurier cérise, 4 grammes
Sirop d'Ecorce d'orange, 30 grammes
Eau pure, 150 grammes.
Le 14 *juin* 1860.
VICTOR DE MÉRIC.

Make this also teach its own lesson—what is the correct English version of the directions which are as common as *horâ somni sumendus?* What is Sel de Seignette, and what are the respective English values of 30, 4, and 150 grammes? Why does the prescriber say *le* 14 *juin* instead of June the fourteenth?

From America we get many *pharmacal* illustrations, some including very recent remedial agents, as for instance

Sulpho-carbolate Zinc, ʒij
Water, ℥iv
M. Two teaspoonfuls to a pint of water.
Sig. for external use.

Not the least curious are the Pencil Prescriptions mostly written on the druggist's counter: these are retained by the pharmacist invariably, as also many others.

AMERICAN PENCIL PRESCRIPTION.
℞ Ext. Monesiæ ʒj
,, Nucis Vomic. gr. iv.
M. ft. pil. No. XX.

Another.
℞ Ol. Erigeronii ℥j
S. Take twenty drops four times a day.
D. W. C.

A third.
℞ Tinct. Gelsemin, ʒiij.
S. Fifteen drops three times a day.
GILLETTE.

℞ Gelsemin, gr. iv
Lupulin, gr. xxxij
M. ft. chart. No. 16.
Sig. Dose, 1 three times a day. RAY.

Now let us ask, though we are all familiar with Ext. Monesiæ, what are Ol. Erigeronii, Gelsemin and its Tincture?

GERMAN PRESCRIPTION.
℞ Tincturæ Aurantiar.
,, Chinæ Comp.
,, Mal*l*at. Ferri
,, Gentianæ
,, Ci*n*amomi
āā unc. semisse.
M. D. Sig. mane et vesperi cochlear. capt.

℞ Bromi Puri ʒij
Kali Hydrobromici ℥ss
Liniment. Opodeldoc ℥iv
Misce, fiat lege artis linimentum consistentiæ Balsami Opodeldoc. Detur ad vitr. epist. vitreo bene claus.
S. Bromine Liniment.
Sept. 19, 1855. DR. OSCAR PRIEGER.

This leads me once more to offer a needful explanation. The arranged Prescription-books when completed are designed to answer two purposes: the first—the essential one, to present a number of varied formulæ sufficient as far as one volume is concerned, to render a certain familiarity with medical instructions possible. One book cannot suffice, but it may form the commencement of a more extended series to be extended indefinitely hereafter by individual exertion; still this single folio will be manifestly better than none, while want of variety will, it is hoped, not be amongst the number of its defects. Here are a few examples in illustration:—the contractions often incorrect are copied from the originals.

℞ Lupulin gr. iv
Pulv. Camphoræ gr. x
Gelsemin gr. xxiij.
M. ft. chart. No. 20. Sig. Dose, 1 three times a day.

℞ Syrupi Wahoo ℥ss
,, Pini Palustris ℥iiiss
Brom. Ammo. ʒij
Mur. Ammo. ʒss
Chlorate Potass. ʒss.
M. S. A. Sig. One teaspoonful as required.
3 . 30 . 69. DR. HILDRETH.

℞ Podophyllin gr. iij
Ext. Colchic. Rad. Acet. gr. ij
,, Hyoscyami gr. v.
M. ft. *Pills* No. 8. Sig. Take j every three hours until bowels act freely.
RAY.

℞ Atropiæ Sulph. Neutral. gr. ij
Aquæ Destill. ℥ss.
M. S. A. Sig. Eye Drops.
4 . 3 . 69. DR. HILDRETH.

℞ Macrotin ℈j
Caulophyllin ℈ij
Ferri Per. Hydrogen ʒj.
M. ft. *Pills* No. 60. Sig. Dose, 1 three times a day after eating.

RAY.

℞ Tinct. Rad. Phytolaccæ,
„ Guaiaci, āā ℥j.
Misce. Sig. 1 teaspoonful in milk three times a day after meals.

HAMILL.

In Sciatica and Chronic Rheumatism.

This is dispensed by P. L. MILLEMAN, Graduate, Philadelphia College of Pharmacy:—

℞ Tinct. Belladonnæ,
Syr. Simplicis,
Aquæ, āā ℥jj.
Misce. Sig. Teaspoonful every hour or two.—R.

CHICAGO.

℞ Pulv. Rad. Rhei Chin.,
Sulphur Præcip.,
Salis Seignette,
Elæosach. Fœniculi, āā ℥ss.
M. ft. pulv. det. ad scatul.

℞. Panes azymos No. vj.

DR. FELIX SCHOON.

℞ Veratriæ pur. ℈ij
Ol. Olivæ ʒij
Ung. Sperm. ʒiij.
Mt. ft. ung.

℞ Ol. Caryoph. ʒij
Ung. Sperm. ʒiij.
M. ft. ung.

DR. TURNBULL.

Characteristic recipe of Sir CHARLES LOCOCK:—

℞ Liquoris Cinchonæ (Battley) ʒij
Sp. Ammoniæ Succinatæ ℈ij
Misturæ Camphoræ ℥iiiss
Tinct. Hyoscyami ʒiiss.
M. Sumat cochlear. max. j ex aquâ, primo mane et horâ 4 P.M.

℞ Camphoræ,
Extracti Aconiti, āā gr. ij.
M. ft. pilula omni nocte sumenda. Mitte iv.
Nov. 16, 1857. C. L.

A short formula of ERASMUS WILSON:—

℞ Ung. Hyd. Nitr. Ox.,
Ung. Odorat. āā ℥j.
M. ft. pomatum. A little to be well rubbed among the roots of the hair night and morning.

E. WILSON.

℞ Quinæ Disulph. ℈j
Syr. Aurantii ℥j
Infus. Rosæ Co. ad ℥viij.
M. Capiat cochl. j mag. ter in die ex aquâ. 11 . 4 . 7.
April 11 . 70. B. SHILLITOE.

Characteristic formula of HUMPHRY SANDWITH:—

℞ Sodæ Sesquicarbon. ʒij
Magnes. Bicarbon. ℈iv
Infus. Aurantii Comp. ℥viiss
Spt. Æth. Nitr.,
Syr. Aurantii āā ʒij.
Ft. mist. Sumat cochl. ij 4 . 9 horâ cum Pulv. Acido.

℞ Acidi Citrici ℈iv.
Dividend. in pulveres viij in aquâ solvend.
March 14, 1865. H. S.

Dragées of Corrosive Sublimate gr. $\frac{1}{12}$
No. 100.
Sig. Take 1 three times daily.

DUNSTEN.

This was prescribed for the wife of a very celebrated preacher:—

℞ Ac. Hydrocyanici dil. ʒj
Liq. Morph. Acet. ʒiij
Bismuth. Subnit. ʒij
Syr. Limon. ʒvj
Aq. ad ℥vj.
M. ft. M. Cap. ℥ss 4tis horis.

V. PETTIGREW.

℞ Limaille de Fer 10 grammes, divisées en 30 paquets
℞ Sirop de Quinquina ½ pint
℞ Oxide de Zinc 4 grammes
Axonge 30 grammes
℞ Douce Amère un paquet.

A. P.

℞ R. Laricis ʒiij
Sp. Æther. Nitr. ʒij
Vin. Ipecac. ʒj
Aquæ Camph. ℥viiss.
Ft. mist. Sumat coch. ij magna ter die.
March 29 . 67. SIR HY. COOPER.

℞ Tinct. Gentian. Co. ℥j
Liq. Taraxaci ʒiiss
Sp. Ammon. Arom. ʒss.
M. Sumat^r coch. medium bis die ex aquæ cyatho.

℞ Pil. Hydrarg.,
Hydrarg. Chlorid., āā gr. iss
Ext. Colocynth. Co. gr. iij
Ol. Menth. Pip. ♏j.
M. ft. pilula pro re natâ sumenda. Mitte vj.
Jany. 14, 1858. DR. WILLIAMS.

℞ Tinct. Opii Camph. ℥j
— Scillæ ʒiij
— Digitalis ʒj
Infus. Rosæ ℥xss
Magnes. Sulph. ℥j.
Fiat. M. duo cochl. magna sumatur pro re natâ.
July 24, 1831. MIDDLETON.

℞ Liq. Taraxaci ℥xj
Tinct. Nucis Vomic.,
Aquæ Laurocerasi, āā ʒiv.
Sign. A tablespoonful three times a day in a wineglass of cold water, adding one of the powders.

℞ Potassæ Bicarb. ʒss.
— Nitratis gr. v.
M. Mitte xx.
Sig. The Powders.
March 31, 1860. J. R. MARTIN.

℞ Potassæ Chlorat. ʒij
Syrup. Aurantii ʒiij
Acid. Hydrochlorici d. ʒij
Syrup. Sennæ ʒiij
Tinct. Gentianæ C. ℥iss
Aquæ Destill. *ad* ℥vj.
M. ft. Mistura. Signa:
A tablespoonful in a wineglassful of water, night and morning.
June 16, 1870. WM. FERGUSSON.

Observe the German writing of the following:—

℞ Aquæ Oxymuriatici ℥ss
— Destill. ℥iv
Syrup. Rubi Idæi,
— Citr., āā ʒiij.
M. D. S. to be taken every two hours half a teaspoonful.

Here is the characteristic formula of Dr. WILLIAMS, presented by Mr. Charles Savory:—

℞ Ol. Morrhuæ pur. ℥viij.

Sumatr cochl. min. (augend. ad amplum) bis die c. Mist. Sequentis cochl. amplo.

℞ Acid. Phosphor. dil. ʒij
Ferri Sulphatis
Quinæ Disulph. āā gr. viij
Sp. Myrist. ℥ss
Syrup ℥j
Aquæ ad ℥viij. M

℞ Morphiæ Acet. gr. j
Etheris Chlorici ℥j
Mist. Acaciæ ℥ij. M

Sumr cochl. min. urgent. tussc.

℞ Aceti Cantharid. ℥j
Sp. Camphoræ ℥ss.

M. fiat Linimentum pectori applicand.

Oct. 6, 1857. C. J. B. W.

The second object contemplated is to show the practice of other countries, and in what different ways nations not our own exercise the healing art. For surely the aspiration of our students ranges higher than the passing an examination. Let it however, for the third time repeated, be clearly understood that these sometimes strangely written, recondite formulæ are not meant to perplex the young pharmacist, nor do they, as far as his examination is concerned, in the least influence the chances of his success.

Let me conclude by outlining an idea which one day may be realized. I propose the subsidiary direct teaching of practical pharmacy by means of autograph prescriptions precisely in the same manner as Oliver taught botany. His system is too well known to need description. He takes an actual flower, and *from* it and *on* it demonstrates its parts, indeed its whole history—why can we not from actual pharmacy obtain the same result? As far as my light goes, Oliver has revolutionized the study of botany; has made its commencement not a work of drudgery but pleasure, for in the case of many modern treatises the introductory chapters should be drafted into the Appendix. Pharmacy seems capable of being aided by the same sensible mode as by the one which Oliver, following the track of his predecessors adopted. Let a student take this characteristic formula of the late Dr. Bright.

℞ Liquor. Calcis lb. ss.

Sumat cochl. mag. ij, more exposito.

℞ Bismuthi Trisnitrat. ℈j
Acidi Hydrocyan. (Scheele) ♏viij.
Sodæ Sesquicarb. ℈iss
Tinct. Card. Comp. ʒij
Mucilaginis ℥ss
Infus. Aurant. ad ℥iv. M.

Fiat Mist. cujus sumat partem quartam ter dic. Applicetur Empl. Cantharidis scob. cord.

R. B.

Then let him set himself the following short examination, giving his answers *aloud* for his *vivâ voce*, or writing them in full.

1. Write out Prescription in correct Latin, with full terminations—give the construction of its nouns, verbs and adjectives.

2. What is liquor calcis—how made—what its use—what is its pharmaceutical history?

3. Bismuthi trisnitrat.—what is its chemical and pharmaceutical history? Describe the metal. What is the moot point of contention respecting its preparation as indicated in the British Pharmacopœia and the formula adopted by private manufacturers?

4. Hydrocyanic acid—how made? why called Scheele's? Official strength and chemical history, therapeutical applications internal and external.

So we might proceed, but space is valuable, and enough has been said already to mark out the idea.

Any student who, in the quiet of his own room, can faithfully go through this ordeal will be effectually saved from the slightest anxiety with regard to one part of his examination. Fifty formulæ, arranged by an intelligent tutor, with due regard to distinctive handwriting, working out in detail this rude sketch, would be an educational gain. Print, or still better, lithograph facsimile, would materially assist.

Meanwhile, when there are so many candidates for our examinations, nearly three hundred having presented themselves the first week in January, let us on our side as a Society representing Pharmacy meet them honourably; let us not ask these young aspirants to make bricks without straw; rather let us give them every facility for acquiring knowledge—and this, if help be not denied, will be the New Year's gift of London to the Country.

THE PRESENCE OF MANGANESE IN BEECH-NUTS.

BY DR. J. E. DE VRIJ.

In the introductory address of the chairman of the last Pharmaceutical Conference* at Liverpool, my attention was fixed by the following sentence:—"By some authors it has been denied that plants absorb from the earth such metals as are not absolutely essential to their nutrition. Experiments, however, afford strong evidence to the contrary. Mr. R. Warington (Journ. Chem. Soc. 1865) found in the ashes of the beech and birch 0·193 per cent. of manganese."

This quotation of Warington's investigation induces me to mention the fact observed by myself more than twenty years ago. As at that time the investigation of the ashes of plants occupied a great many chemists, I also analysed some ashes. Amongst them were the ashes of beech-nuts collected by me in the neighbourhood of Giessen, in Germany. As there exists a great quantity of manganese ore in that vicinity, the presence of a relatively large quantity of manganese in these ashes seemed to me quite natural. In 1847, being at the meeting of the British Association at Oxford, I visited the beautiful park of Blenheim, and collected there on that occasion some unripe beech-nuts. After returning home, I analysed their ashes and found also in these, although grown in a very different soil, the presence of a relatively large amount of manganese. A third analysis of the ashes of beech-nuts, collected in the wood of the Hague, confirmed the same fact. As I was accustomed to use the ashes of beech-nuts in my lectures to demonstrate the reagents for manganese, this fact has been fixed in my memory.

To Camphorate Blisters.—M. Deschamps d'Avallon has suggested, when it is desirable to camphorate a blister, this may be readily accomplished by dropping on its surface a few drops of a saturated solution of camphor in chloroform, made by adding two parts of the latter to four of the former.—*Journal de Pharmacie.*

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* PHARM. JOURNAL, Sept. 17, 1870, p. 234.

PREPARATIONS OF CONIUM; THEIR CHARACTERS AND MEDICINAL VALUE.*

By John Harley, M.D.

In an able and exhaustive paper in the December number of the *Practitioner* for December, Dr. Harley records the results of a continuation of his researches upon the comparative value of the different preparations of *Conium*.† Although written principally for the information of the medical practitioner, it has considerable interest for the pharmacist.

Dr. Harley is of opinion that the only reliable test of the amount of active principle in a preparation of hemlock is physiological action, the alkaloid being so subtle and unstable that chemical reagents used for the quantitative determination of conia, when combined with the ordinary constituents of vegetable infusions, give most fallacious results. He says that any one acquainted with the physiological effects of conia may easily determine its amount by subjecting a nervous system of known power to its action, an experiment for which an hour will suffice.

Schroff has recently stated‡ (1) that the unripe fruit of one-year conium plants contains the smallest amount of conia; (2) that the unripe fruit of biennial plants contains the most conia, especially when the development of the fruit is advanced and near ripening; (3) that the perfectly ripe fruit, produced only by the biennial plants, stands in point of efficacy between these two. Dr. Harley says that he does not quite agree with all these particulars. He has found that conia stands to the ripe and unripe fruit pretty much in the same relation as opium does to the ripe and unripe fruit of the poppy. It abounds in the green pericarp, but gradually decreases as this becomes dry and brown. As to the statement that only biennial plants produce perfectly ripe fruit, he says that for four years he has kept up a little plantation of annual hemlock plants derived from the self-sown seed of a previous generation of annual plants.

The following were the preparations used in the experiments:—

Preparations of the Green Fruit.

1. *Tincture.*—Two samples were used; one distinguished as "London," prepared by macerating the fresh undried crushed annual fruit in proof-spirit, and percolating (℥vj yielded ℥xxvj of tincture); the other was made from dried American fruit according to the directions and in the proportions ordered in the B. P.

2. *Extract.*—Prepared by evaporating the tinctures to dryness over a water-bath, 1000 grain measures yielding 20 grains of bright yellowish-brown brittle extract, which became soft on exposure, from absorption of about 15 per cent. of water, and formed a translucent extract of the colour of Cape aloes. Treated with excess of potash, it assumed a gamboge colour, and evolved a powerful odour of conia.

3. *Fluid Extract.*—Prepared by Dr. Squibb, of Brooklyn, New York; a rich brown spirituous fluid of sp. gr. 0·992, one minim representing one grain of the green undried fruit. 1000 grain measures yielded 98 grains of extract, possessing the same physical characters as the preceding.

Preparations of the Fresh and Flowering Plant.

4. *Succus Conii*, B. P.—The author calls attention to the variability of this preparation according to the quantity of water contained in the plants. The colour, varying from that of pale sherry to dark Marsala wine, is an evidence of its strength, succus as dark as the latter being three times as strong as the palest variety. Two preparations were used; one intermediate in depth and colour, prepared from year to year by Mr. Buckle; the other, darker and stronger, prepared in the unusually dry season of 1865 by Messrs. Allen and Hanbury.

5. *Extractum Conii*, B. P.—The author says that 6 grains, the maximum dose of this preparation, cannot possibly contain more than 0·084 of a grain of conia, a quantity insufficient to produce hemlock effects in a child two years old; while 60 grains at least of the freshly-prepared extract are required to produce slight effects in the active, and 15 to 20 on the most enfeebled adult.

6. *Tincture.*—Prepared by Mr. Deane, of Clapham, from half-blown plants gathered in the last week in June, 1869, by exhausting 32 ounces (avoird.) of the herb, previously crushed in a mill, with rectified spirit until 53 ounces of tincture were obtained (= nearly 5 drachms of the fresh plant in f℥j). Of a grass-green tinge at first, but became brownish on keeping; sp. gr. ·940; 1000 grain-measures yielded 36 grains of light yellowish-brown extract, which absorbed 15 per cent. of water. During evaporation a quantity of green resin separated.

Preparations of the Dried Plant.

7. *Tincture.*—Prepared by Mr. Deane from similar plants to the preceding, dried in the open air, and used as soon as dry (16 ounces of the fresh herb yielded 4 ounces of the dry). In this preparation the directions of the P. L., 1851, were followed, *i. e.* 2½ ounces (avoird.) to 20 fluid ounces of rectified spirit. It retains a bright green tinge. A quantity of vivid emerald-green resin separated on evaporation. Sp. gr. ·940; 1000 grain-measures yielded 32 grains of extract, possessing the same general characters as the preceding, but more deliquescent, absorbing 25 per cent. of water.

8. *Fluid Extract.*—Prepared by Messrs. Clarke, Beasdale, Bell and Co., of York, from herbs gathered in the neighbourhood of York, at Midsummer, in the exceptionally hot and dry season of 1868. The roughly-ground leaves being exhausted by percolation of proof-spirit, the spirit was distilled off, and the extract evaporated until one fluid drachm equalled one drachm of the dry leaves (= ½ ounce of fresh herb). This is a dark yellowish-brown watery fluid of a rank hemlock odour, depositing much greenish-brown resin on the sides of the bottle. 1000 grain-measures yielded 195 grains of bright, orange-brown, brittle extract, rapidly absorbing water to the extent of 19 per cent.

9. *Benzoate of Conia.*—The author had had furnished to him by a member of a City firm of druggists a solution labelled "Benzoate of Conia; one drachm contains two grains. Dose, five to twenty drops;" and also samples of the solid substance. Failing to obtain from it any physiological effects, even when the dose was increased to 20 grains of the solid substance, he was induced to give it a thorough examination, which led him to the conclusion that the so-called benzoate of conia was an impure benzoate of soda, devoid of a trace of conia.

A neutral benzoate of conia is obtained by mixing equal proportions of solutions of conia and benzoic acid in dilute spirit, evaporating to dryness and preserving over sulphuric acid. The result is a clear bright amber-coloured body of the consistence of soft extract, with a faint conia odour, a bitter taste devoid of acridity, and forming with water an odourless solution. This substance and its aqueous solution, even when a thousand times diluted, evolves the odour of conia when supersaturated with potash; and this occurs in the presence of large quantities of either benzoic acid or benzoate of soda, showing that these bodies do not interfere with the nasal test for conia. Heated in a test-tube the benzoate runs, volatilizes and decomposes with evolution of white fumes, in which the odour of benzoic acid is masked by the more powerful one of conia.

* Abstracted from a paper by Dr. Harley, published in the *Practitioner* for December, 1870.

† See Pharm. Journ., 2nd ser., Vol. VIII. pp. 413, 452, 572, 601, 710; IX. 471.

‡ Wochenblät. der K. K. Gesellschaft der Aerzte in Wien, 1870, No. 1; and Pharm. Journ. No. 18, p. 348.

An acid benzoate was formed by the addition of two equivalents of the acid to one of conia. It resembled the preceding in its reactions, but was colourless, odourless, and less soluble in water. Attempts to combine more of the acid, so as to produce a dry salt, failed.

The following are the results of the experiments so far as they show the relative strength of the preparations. The drug was administered to persons familiar with the intoxicating effects of hemlock, and the doses were given as nearly as possible under similar conditions. The strength of the preparation was inferred by the extent of physiological action induced upon a system of known power.

1. The first experiment was made with Extractum Conii, B. P., and Succus Conii, B. P. (Buckle's). The relative value was—gr. xx extract = fʒij succus.

2. Extractum Conii, B. P. (prepared by Bell and Co. in 1867–8) and Succus Conii, B. P. (Buckle's).—gr. xl extract = fʒiv succus; gr. lx extract = fʒvj succus.

3. Extractum Conii, B. P., Succus Conii, B. P., and Tincture of Green Fruit (American, ℥ivss fruit yielding f℥x).—gr. xlv. extract = ʒivss succus = ♏80 tincture.

4. Succus Conii, B. P. (Buckle's, 1866) and Tincture of the Green Fruit (London ℥v in ℥xx).—ʒiv succus = ♏50 tincture.

10. Extractum Conii, B. P. (Bell's, 1868), Succus Conii, B. P.—gr. 40 extract = fʒiv succus.

11. Succus Conii, B. P. (Buckle's, 1867; the plant yielded 75 per cent. of juice) and Succus Conii, B. P. (Allen and Hanbury's, 1865; the plant yielded about 35 per cent. of juice).—ʒix of Buckle's = ʒiij of Allen and Hanbury's.

12. Extract of the Green Fruit (American) Tincture of the Green Fruit (American), and Succus Conii (Buckle's, 1867).—gr. iij extract = fʒiv tincture = ʒiv succus.

13. Succus Conii, B. P. (Buckle's, 1860) and Extract of the Green Fruit (London).)—ʒivss succus = gr. iij extract.

14. Squibb's Fluid Extract, Tincture of the Green Fruit (London), Succus Conii, B. P. (Buckle, 1866), Deane's Tincture of the Fresh Plant, Deane's Tincture of the Dry Plant, and Clarke and Co.'s Fluid Extract.—♏50 Squibb's fluid extract = ʒiss tincture green fruit = fʒv succus = ʒiijss to ʒiv Deane's tincture fresh plant = fʒj Deane's tincture dry plant = ʒiijss Clarke's fluid extract.

15. Squibb's Fluid Extract, Succus Conii, B. P. (Buckle's, 1867), Succus Conii, B. P. (Allen and Hanbury's, 1865), Tincture of the Green Fruit (London), Deane's Tincture of the Fresh Plant and Neutral Benzoate of Conia.—ʒj Squibb's fluid extract = ʒvj pale succus = ʒij dark succus = ʒiss tincture green fruit = ʒiv tincture fresh plant = ¾ gr. neutral benzoate.

16. Results similar to 14.

17. Results similar to 14, 15 and 16.

18. Succus Conii, B. P. (Buckle's, 1867) and Benzoate of Conia.—ʒvj succus = gr. ½ benzoate.

The author draws the following conclusions from his experiments:—

That the superiority of the green fruit over every other part of the plant, as the basis of the tincture and extract, is clear and decided. He considers the Pharmacopœia extract to be a scandal to the present state of medical knowledge, and that as soon as possible a spirituous extract of the green fruit should take its place.

That although the variability in strength of the succus is a drawback, this might be in great measure removed by the cultivation of the plant for medicinal use. At present the wild plant is gathered as soon as it makes the least show of flowering instead of being allowed to remain until the fruit begins to form.

Another grievance is the expensiveness of the succus. With the following remarks on this point Dr. Harley concludes his paper:—"This is a discredit to pharmacy, for hemlock is the rankest of our native weeds, and by an abundant yield of juice would well repay the room required for its growth; cultivation it requires none. If our pharmaceutists remain blind to their interests, medical men must help themselves, and annually rear a dozen plants in some waste spot of their garden. These will yield them a pound of green fruit, from which, with a very little trouble, may be made a tincture stronger than any juice that can be produced, and an extract, of which three grains would produce decided effects in most persons.

SAPONACEOUS PLANTS.

BY P. L. SIMMONDS.

Many plants in different countries furnish useful substitutes for soap to the natives, where there are no conveniences or materials for manufacturing the ordinary soap of commerce. Prominent among these are the soapworts, tropical plants belonging to the genus *Sapindus*. The Hindoos use the pulp of the fruit of *Sapindus detergens* for washing linen. Several of the species are used for the same purpose instead of soap, owing to the presence of the vegetable principle called saponine. The root and bark also of some species are said to be saponaceous. The capsule of *Sapindus emarginatus* has a detergent quality when bruised, forming suds if agitated in hot water. The natives of India used this as a soap for washing the hair, silk, etc. The berries of *Sapindus laurifolius*, another Indian species, are also saponaceous. The name of the genus *Sapindus* is merely altered from *Sapo-indicus*, Indian soap, the aril which surrounds the seed of *S. Saponaria* being used as soap in South America. According to Browne, the seed-vessels are very acrid; they lather freely in water, and will cleanse more linen than thirty times their weight of soap, but in time they corrode or burn the linen. This assertion, however, requires confirmation. Humboldt tells us that proceeding along the river Carenicuar, in the Gulf of Cariaco, he saw the native Indian women washing their linen with the fruit of this tree, there called the *Para para*. Saponaceous berries are also used in Java for washing. The fresh bark of the root *Monnina polystachia* (R. and P.), called *Yalhoi*, pounded and moulded into balls, is used by the Peruvians in place of soap.

Saponine exists in many other seeds and roots—in the legumes of *Acacia concinna*, in which a considerable trade is carried on in some parts of India, and in the root of *Vaccaria vulgaris*, *Agrostemma Githago*, and *Anagallis arvensis*. It also occurs in various species of *Dianthus* and *Lychnis*, and in the bark of *Silene inflata*. *Gypsophila struthium* is used by the Spaniards for scouring instead of soap. The bruised leaves of *Saponaria officinalis*, a native of England, forms a lather which much resembles that of soap, and is similarly efficacious in removing grease spots. The bark of *Quillaia saponaria* of Central America answers the same purpose, and is used as a detergent by wool dyers. It has been even imported largely into France, Belgium, etc., and sold in the shops as a cheap substitute for soap. The fruit of the *Bromelia Pinguin* has also been found useful as a soap substitute.

A vegetable soap was prepared some years ago in Jamaica from the leaves of the American aloe (*Agave Americana*), which was found as detergent as Castile soap for washing linen, and had the superior quality of mixing and forming a lather with salt water as well as fresh. Dr. Robinson, the naturalist, thus describes the process he adopted in 1767, and for which he was awarded a grant by the House of Assembly of Jamaica:—The lower leaves of the Curaca or Coratoe (*Agave Karatu*) were pressed between heavy rollers to express the juice, which, after being strained through a hair cloth, was merely inspissated by the action of the sun, or a slow fire, and cast into balls or cakes. The only precaution deemed necessary was to prevent the mixture of any unctuous materials, which destroyed the efficacy of the soap. Another vegetable soap, which has been found excellent for washing silk, etc., may be thus obtained:—To one part of the cake add one and a half part of the before-named *Agave Karatu*, macerated in one part of boiling water for twenty-four hours, and with the extract from this decoction mix 4 per cent of rosin.

In Peru, the leaves of the *Maguey Agave* are used instead of soap; the clothes are wetted, and then beaten with a leaf which has been crushed; a thick white froth is produced, and after rinsing the clothes are quite clean. The pulpy matter contained in the hard kernel of a tree called locally *Del Jaboncillo*, is also used there for the same purpose. On being mixed with water, it produces a white froth. In Brazil, soap is made from the ashes of the bassena or broom plant (*Sida lanceolata*), which abounds with alkali. There are also some barks and pods of native plants used for soaps in China. The soap plant (*Amole*) of California, *Phalangium pomeridianum*, is stated by Mr. Edwin Bryant to be exceedingly useful. The bulbous root, which is the saponaceous portion, resembles the onion, but possesses the quality of cleansing linen equal to any olive soap manufactured.

From a paper read before the Boston Society of Natural History, it appears that this soap plant grows all over California. The leaves make their appearance about the middle of November, or about six weeks after the rainy season has fairly set in; the plants never grow more than a foot high, and the leaves and stalk drop entirely off in May, though the bulbs remain in the ground all the summer without decaying. It is used to wash with, in all parts of the country, and, by those who know its virtues, it is preferred to the best of soap. The method of using it is merely to strip off the husk, dip the clothes into the water, and rub the bulb on them. It makes a thick lather, and smells not unlike brown soap.

At St. Nicholas, one of the Cape Verde Islands, they make a soap from the oil of the *Jatropha Curcas* seeds, and the ashes of the burnt papaw-tree leaf. The oil and ashes are mixed in an iron pot heated over a fire, and stirred until properly blended. When cool it is rolled up into balls about the size of a six pound shot, looking much like our mottled soap, and producing a very good lather.—*The Journal of Applied Science.*

PHYSOSTIGMA VENENOSUM.*

The *Physostigma venenosum*, or ordeal bean of Old Calabar, has of late been used medicinally. Its peculiar and powerful poisonous properties were long ago made known by Drs. Christison and Balfour, but we owe the fuller knowledge we now possess of its powers to the elaborate investigations of Dr. Fraser of Edinburgh, Dr. Robertson and other observers. The active principles of the bean quickly enter the blood and gradually produce general paralysis, which is due, according to Dr. Fraser, to changes effected in the spinal cord. In an animal poisoned by the bean the reflex functions of the cord are destroyed—"It acts on the spinal cord by destroying its power of conducting impressions." This results "in muscular paralysis, gradually extending to the respiratory apparatus, and producing death by asphyxia; and in a rapid paralysis of the heart, causing death by syncope. It also causes paralysis of muscular fibre, striped and unstriped." The knowledge obtained by these investigations led to the employment of the bean as a remedy in tetanus, and a considerable number of cases have been treated by it. Dr. Fraser has a high opinion of its value, and has reported twelve cases of tetanus treated by it, of which nine recovered. Many other cases of its administration in this disease have been reported in the various medical journals, English and foreign, and in not a few of these instances the patients have undoubtedly recovered; but the results, on the whole, have scarcely supported Dr. Fraser's estimate of the remedial value of the drug, while in some cases it has been suspected of doing harm rather than good, and of increasing the patient's danger by its paralysing action.* It has been observed, too, that in most of the cases of recovery the disease lasted about a month, just as in cases successfully treated with atropia, hydrate of chloral, and other remedies. The physostigma has been employed in other maladies. It is indisputably a weapon of great power, and must be used with great care and watchfulness: at the same time, in such a disease as tetanus, it must, as Dr. Fraser has insisted, be employed early. The Pharmacopœia contains two preparations, the powder and an extract; the first may be given by the mouth, in doses of from one to four grains for an adult; the extract, subcutaneously, in doses of one-tenth to one-third of a grain and more, the dosage being regulated by the effects.

The physostigma has also the peculiar properties of causing very rapidly contraction of the iris, and altering the power of accommodation of the lens, and it has been largely used and proved of great value in ophthalmic practice. Its action on the iris was first pointed out by Dr. Fraser,† and first made use of by Dr. Argyll Robertson.‡ A very interesting communication on the subject, by Mr. J. Soelberg Wells, containing a description by Mr. Bowman of the effects of a solution of the bean on his own eye, was published in the *Medical Times and Gazette* in 1863.§ It may be applied by touching the inside of the eyelid with a solution, one minim of which equals four grains of the bean, or by placing within a minute portion of paper which has been saturated with a strong solution.

* Abstracted from a series of papers on the "Progress of Therapeutics," published in the *Medical Times and Gazette.*

* Mr. Holthouse's case, *Clinical Society's Transactions*, vol. ii.; and *Medical Times and Gazette*, 1869.

† "On the Characters, Actions, and Therapeutic Uses of the Ordeal Bean of Calabar." Graduation Thesis. August, 1862. *Edinburgh Medical and Surgical Journal*, 1863.

‡ *Edinburgh Medical and Surgical Journal*, 1863.

§ "On the Effects of the Solution of the Calabar Bean on the Pupil," etc. *Medical Times and Gazette*, vol. i. p. 500, 1863.

GLYCERINE SOLUTIONS OF PEPSIN AND OTHER SUBSTANCES.

BY LIONEL S. BEALE.

In *Nature* of December 29th, Professor M. Foster calls attention to the method of making glycerine extract of pepsin pursued by Von Wittich, and remarks with reason that the means hitherto adopted for preparing pepsin for medical purposes are clumsy and inefficient. There is, however, one exception, a mode of preparation which has long been in use, and which is by no means inefficient. This will be found to possess some practical advantages over the process of extracting the fresh mucous membrane with glycerine, while from it the glycerine solution can be prepared quite as pure and clear, and as strong as by maceration.

As long ago as 1858 ('Archives of Medicine,' vol. i. pp. 269–316) I described a method of obtaining the active digestive material from the pig's stomach, which answers perfectly, and has been employed in practice ever since. It simply consists in quickly drying the mucus expressed from the stomach glands upon glass plates.‖ The dried mucus is then powdered and kept in stoppered bottles. It retains its properties for years. Eight-tenths of a grain will dissolve *one hundred grains* of coagulated white of egg.

Now, from this powder is easily prepared by solution in distilled water a perfectly clear and colourless digestive fluid of great activity, which *can be readily filtered.*

‖ This pepsin is prepared for medical purposes by Messrs. Bullock and Reynolds, 3, Hanover Street, Hanover Square.

Some years ago I found great advantage from subjecting tissues to the action of a very small quantity of this solution in glycerine, and keeping the whole at the temperature of 100° for some hours. By this process the elements of the tissue were softened, and could be dissected from one another readily for examination under the highest magnifying powers.

No doubt there is much to be learnt concerning the nature of the action of such substances upon tissues by the use of glycerine solutions. For microscopical work glycerine is of more use than any other medium. Not only may various substances be removed from tissues, but others may be introduced, and the tissue subjected to the action of various reagents without destroying it. In fact, the action may be regulated with the greatest nicety. Nearly all the tests required in microscopical examination may be dissolved in glycerine ('How to Work with the Microscope,' p. 297, 1867) and tissues of the most delicate character may be preserved in it, and will retain their microscopic characters for years, *if care be taken to obtain the best and strongest glycerine.*—*Nature.*

THE SALE OF POISONS BY DRUGGISTS.

THE LAW IN THE STATE OF NEW YORK.

BY FRANCIS TILLOU, ESQ., COUNSELLOR-AT-LAW.

The sale of poison by druggists is regulated in the State of New York by statute.

By the Revised Statutes, vol. ii. p. 649, sec. 23, it is enacted that "Every apothecary, druggist, or other person who shall sell and deliver any arsenic, corrosive sublimate, prussic acid, or any other substance or liquid usually denominated poisonous, without having the word 'poison' written or printed upon a label attached to the phial, box, or parcel in which the same is sold, or who shall sell and deliver any tartar emetic without having the true name thereof written or printed upon a label attached to the phial, box, or parcel containing the same, shall upon conviction be adjudged guilty of a misdemeanour, and shall be punished by a fine not exceeding one hundred dollars."

By an Act to regulate the sale of poisons, chapter 442 of the laws of 1860, passed April 16, 1860, it was enacted by the first section of said Act, "that no person should sell or give any poison or poisonous substance, without recording, in a book to be kept for that purpose, the name of the person receiving said poison, his or her residence (together with the name and residence of some person as witness to such sale), excepting upon the written order or prescription of some regularly authorized practising physician, whose name must be attached to such order. Such book to be kept open for inspection."

But by an Act passed 1862, chapter 273 of the session laws of 1862, the above first section of the Act of 1860 was amended by leaving out the requisition for the name of a witness to the sale.

By the second section of the Act of 1860 it is further enacted that no person shall sell, give or dispose of any poison or poisonous substance, except upon the order or prescription of a regularly authorized practising physician, without attaching to the phial, box, or parcel containing such poisonous substance, a label with the name and residence of such person, and the word "poison" all printed upon it with *red ink*, together with the name of such poison, written or printed thereon in plain and legible characters.

By the third section of the Act of 1860, it was further enacted, "That the above provisions should apply to the following poisonous substances, excepting when sold in wholesale quantities of one pound or over, viz. arsenic and its various preparations, oxalic acid, corrosive sublimate, chloroform, sugar of lead, tartar emetic, opium and its preparations, oil of bitter almonds, cyanurets of potassium, mercury, silver, and zinc, deadly nightshade, henbane, poison hemlock, prussic acid, aconite and its various preparations, atropia and its salts, cantharides, croton oil, datura and its salts, delphinia and its salts, digitalis and its various preparations, nux vomica and its preparations, elaterium, ergot and its preparations, veratria and its salts, cannabis and its preparations."

By the Amendatory Act of 1862 this third section of the Act of 1860 was repealed.

By the fourth section of said Act of 1860, it is enacted that any person infringing any of the provisions of said Act shall, upon conviction, be deemed guilty of a misdemeanour, and shall be punished by a fine not exceeding fifty dollars.

By the fifth section of said Act of 1860, it is further enacted that said Act shall *only* apply to incorporated cities and villages having a population of one thousand inhabitants and upwards in this State.

By chapter 478 of the laws of 1869, an Act regulating the preparation of medical prescriptions was passed May 1, 1869.

By the first section of this Act of 1869, it is enacted that no person employed or in attendance at any drug store or apothecary shop shall prepare a medical prescription, unless he has served two years' apprenticeship in a drug store, or is a graduate of a medical college or a college of pharmacy, except under the direct supervision of some person possessing some one of the before-mentioned qualifications; nor shall any one having permanent charge as proprietor or otherwise of any store at which drugs are sold by retail, or at which medical prescriptions are put up for sale or use, permit the putting up or preparation thereof therein by any person, unless such person has served two years as apprentice in a retail drug store, or is a graduate of a medical college or a college of pharmacy.

And by the second section of the same Act, it is provided that any person violating the provisions of said Act shall be guilty of a misdemeanour, and shall be punished by a fine not exceeding one hundred dollars, or by imprisonment not to exceed six months in the county jail; and in case of death ensuing from such violation, the person offending shall be deemed guilty of felony, and be punished by a fine not less than one thousand dollars, nor more than five thousand dollars, or by imprisonment in State prison for a term of not less than two years, nor more than four years, or by both fine and imprisonment, in the discretion of the court.

By statute every man who by his culpable negligence causes the death of another, although without any intent to kill, is guilty of manslaughter. (2 R. S. 662, sec. 19.)

The foregoing seem to be all the existing statutory provisions on the subject.

A druggist who negligently sells a poison, labelled as a harmless drug, and thereby causes the death of a person to whom it is administered, is guilty of manslaughter.

So highly does the law value human life that it admits of no justification wherever life has been lost, and the carelessness or negligence of one person has contributed to the death of another.

And this rule applies not only when the death of one is occasioned by the negligent act of another, but where it is caused by the negligent omission of a duty to that other.

Besides the penalties imposed by statute, there is also a common law liability of the druggist for damages sustained by his negligence.

All persons who deal with deadly poisons are held to a strict accountability for their use.

The highest degree of care known amongst practical men must be used to prevent injury from the use of such poisons.

And one who sells poison labelled as an innocent drug is liable in damages to any person injured thereby, no matter through how many hands it may have passed.

A druggist is undoubtedly held to a special degree of responsibility for the erroneous use of poisons corresponding with his superior knowledge of the business.

Affixing a false label to a poison, and sending it into market in that condition so as thereby to mislead others and endanger human life, is an unlawful act for which the party guilty of the act is responsible, whether he did it wilfully or negligently, and to entitle the aggrieved party to his action in such case no privity is necessary except such as is created by the unlawful act and consequential injury. Privity of contract in such case is out of the question. For a duty violated by a druggist giving a false label is a duty not created by contract, but by law, every one being under an obligation to abstain from acts tending naturally and probably to endanger human life.

The injury is not rendered too remote to sustain a recovery because separated from the unlawful act by intervening events, however numerous or of whatever kind, provided they are the natural and probable consequences of the act.

And when the unlawful act is in its nature likely to produce the events which follow, as, for instance, a patient taking a poison instead of some harmless or different prescription than that intended, by reason of a false label of a druggist, the author of it may be treated as having caused the succeeding events, though they consisted of the acts of third persons. For the false label is a continuing authority or direction by the druggist for the use of the poison, and he is bound to indemnify against the acts which it was likely to cause when sold in that condition.

The foregoing propositions seem to be fully sustained by the case of Thomas *v.* Winchester, in the Court of Appeals.

That was an action brought to recover damages for negligently putting up, labelling, and selling as and for the "Extract of Dandelion" a jar of the "Extract of Belladonna," by means of which the plaintiff's wife, Mrs. Thomas, being sick, a dose of dandelion was prescribed by a physician, and a portion of the contents of the jar of belladonna was administered as and for the extract of dandelion, etc.

The facts of the case, briefly, were as follows:—

The defendant, Winchester, was engaged at 108, John Street, New York, in the manufacture and sale of certain vegetable extracts for medicinal purposes, and in the purchase and sale of others.

The extracts manufactured by him were put up in jars for sale, and those he purchased were put up by him in like manner.

The jars containing extracts manufactured by himself and those containing extracts purchased by him from others, were labelled alike—both were labelled as "prepared by A. Gilbert," a person in the employ of defendant.

The jar in question was labelled "½ *lb. Dandelion, prepared by A. Gilbert, No.* 108, *John Street, N.Y.;*" and in fact contained belladonna, and not dandelion.

The jar was sold by defendant to a wholesale druggist in New York, as and for the extract of dandelion. Dr. Foord, a physician and druggist at Cazenovia, Madison county, N. Y., purchased the article from the New York druggist, as and for the extract of dandelion.

Mrs. Thomas being ill, her physician prescribed a dose of dandelion. Her husband purchased what was believed to be the medicine prescribed, at the store of Dr. Foord. The medicine was taken from the jar in question and administered to Mrs. Thomas, who was thereby made dangerously ill, and the action was brought against Winchester and Gilbert to recover damages.

It appeared that the extract in the jar in question was not manufactured by defendant himself, but was purchased by him from another manufacturer or dealer, but labelled with Gilbert's labels, which labels were paid for by Winchester, and used in his business with his knowledge and assent.

It was objected, among other questions, that the action could not be sustained, as the defendant was the remote vendor of the article in question, and there was no connection, transaction, or privity between defendant and the plaintiff.

A verdict was rendered against the defendant Winchester; the defendant Gilbert being acquitted by direction of the Court.

The defendant Winchester appealed to Court of Appeals, and it was there held that a dealer in drugs and medicines, who carelessly labels a deadly poison as a harmless medicine, and sends it so labelled into market, is liable *to all persons* who, without fault on their part, are injured by using it as such medicine in consequence of the false label. That the liability of the dealer, in such case, arises, not out of any contract or direct privity between him and the person injured, but out of the duty which the law imposes upon him to avoid acts in their nature dangerous to the lives of others. He is liable, therefore, though the poisonous drug with such label may have passed through many intermediate sales before it reaches the hands of the person injured. That where such negligent act is done by an agent, the principal is liable for the injury caused thereby.

Although the defendant Gilbert was acquitted by the jury under direction of the Court, and judgment rendered against the defendant Winchester alone for damages, Judge Ruggles, in delivering the opinion of the Court of Appeals, said that "Gilbert, the defendant's agent, would have been punishable for manslaughter, if Mrs. Thomas had died in consequence of taking the falsely labelled medicine." (2 R. S. 662, § 17; Tessymond's Case; 1 Lewin's Crown Cases, 169; Regina *v.* Swindall; 2 Car. & Ker. 232.)

"Although the defendant Winchester may not be answerable criminally for the negligence of his agent, there can be no doubt of his liability in a civil action, in which the act of the agent is to be regarded as the act of the principal."

See the case fully reported in 6 New York (2 Selden) Reports, page 397, and the numerous authorities there cited and referred to.

The law regulating the sale of poison by druggists might be amended in this respect:—

Druggists should be required, in addition to the label of poison and the name of the poison, to name also the antidote to such poison, and give brief directions for administering the antidote. This should be printed or written plainly and legibly, so that in cases of poison being taken by accident or design, an antidote could be quickly administered without the delay of getting a physician; and no doubt many lives could thereby be saved.

The law of 1860 seems to be defective in limiting its application to incorporated cities and villages having a population of one thousand inhabitants and upwards.

It might with advantage be made general in its application throughout the State.—*Medical Record.*

SPIRITUS AMMONIÆ AROMATICUS.

The following are the results of the analyses of six samples of the above preparation, obtained from different druggists, published in the *Practitioner*:—

Nos.	Per cent. Alcohol by weight in volume.	Per cent. of Ammonia by weight in volume.
Brit. Pharm.	62·6	2·6
I.	63·1	2·0
II.	53·7	1·4
III.	52·4	1·5
IV.	52·2	1·3
V.	51·4	1·2
VI.	48·1	1·5

The Pharmaceutical Journal.

SATURDAY, JANUARY 21, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

PRESCRIPTIONS.

THE principal practical part of a pharmacist's duty being the compounding of recipes emanating from men supposed to know better than himself the therapeutical effects of the drugs employed, it would be presumptuous in the face of such a supposition for the pharmacist to add, alter, or subtract one iota from the prescriptions presented to him. And the grand basis of all social well-being in every relationship of life consisting in *sincerity*, how much more must it be self-evident that in life-and-death cases between patient, physician and prescriber, all should be actuated by the sincerest motives for the mutual good of each. Yet the pharmacist is often obliged to act as a check on the physician's involuntary mistakes, or occasional posological errors. One of the great sources of doubt and uneasiness to the most sincere and intelligent dispensers is the omission of terminations. Admitting the general public not to understand Latin, why mutilate it, rendering it more unintelligible to them and more puzzling to the dispenser. What can be more ambiguous than the everyday ℞. pot. chlor. or sodæ sulph. of ordinary prescription-writers? It is true that habit, experience, and above all, a knowledge, not only of the properties of medicines, but of their therapeutical uses, enable the dispenser in 99 cases out of 100 to skim over the difficulty, scarcely noticing it. But frequently the ambiguity and consequent responsibility become much greater.

This lax and undignified habit of abbreviating nearly every word has caused, and causes, innumerable mistakes. Why should, for instance, the dispenser use chlorate of potassium in a gargle where pot. chlor. is ordered? Common salt dissolved in water is a frequent domestic remedy for sore-throat, why should not chloride of potassium be equally efficacious? and why might not the physician wish to try it? A dispenser takes an unwarrantable amount of responsibility in selecting one salt in preference to the other. And the physician has no right to throw a shadow of that sort of responsibility on the druggist's shoulders. Moreover, these things occur so often that people are content to lie prone *in statu quo*, without ever trying in the least to improve the situation.

The habit of writing Latin prescriptions must be considered, on the whole, an advantageous one; for in countries where the vernacular is used as a medium of understanding between doctor and druggist, the tendency to revert to old-fashioned and even quite obsolete terms, causes quite as much misapprehension as abbreviated Latin does here. This is evidently done for exactly the same reason as obscure Latin is even openly sanctioned by some members of the profession, in order to prevent the patient from feeling nervous at the exhibition of opium or calomel. But sick people's faculties are often miraculously sharpened by curiosity, and experience proves that such awful names as *Sirop de Karabé* or protochloride of hydrargyrum, though even cautiously pronounced and declared safe and reliable medicines by the urbane chemist, will frighten nervous people ten times more than the names of drugs familiar to the ears of all intelligent persons.

Needless mysticism is the greatest fault of all, for it necessarily causes more mistakes at the dispenser's hands than is warranted by an increased privacy of inter-communication. An eminent English practitioner, whose prescriptions are to be found all over the Continent, always writes Syr. C. for simple syrup,—an anything but orthodox synonym, syrupus communis being used to designate treacle in the Prussian Pharmacopœia.* Could not a great amount of good be done to the pharmaceutical community at large if a few "sincere" dispensers in the large houses in town and country would quietly note any of these peculiarities and have them periodically published?

THE QUALITY OF DRUGS.

IT is announced in the *Practitioner* for January that, in consequence of complaints made by medical men as to the varying qualities of drugs, even when obtained from the most respectable shops, it is intended to commence an extensive examination of preparations of food and medicine, the results of which will be published in that journal. As a commencement, the results of a series of analyses of samples of sp. ammoniæ aromaticus are given. According to the British Pharmacopœia this preparation should contain 62·6 per cent. of alcohol by weight in volume, and 2·6 per cent. of ammonia by weight in volume. The quantities in the six specimens analysed ranged from 63·1 to 48·1 per cent. of alcohol and from 2·0 to 1·5 per cent. of ammonia.

It is unfortunate that this preparation should have been selected for the purpose of introducing the examinations contemplated by our contemporary, for it is one in reference to which there are

* "Syrupus communis—Gemeiner Syrup. Nonnisi syrupus in depurando saccharo Indico obtentus adhibeatur." —*Ph. Borussica*, p. 193.

great differences of practice. Several of our oldest and most respectable establishments have their own formulæ for this preparation, and they find it requisite to follow those formulæ in order to meet the demands of their customers. It is therefore by no means a legitimate inference that a deviation from the Pharmacopœia in the sal volatile bought at a shop of credit is to be regarded as indicating inferiority. This is not a matter of quality or of price, and before any one can justly assert that particular druggists improperly make use of preparations which do not conform to the Pharmacopœia, the examiner must be careful to make sure that he obtains from the vendors such preparations as they would use in dispensing and not for ordinary sale. There may be, without any impropriety, a great difference in this respect, not at all inconsistent with due adherence to the Pharmacopœia in all cases of dispensing.

The *Melbourne Argus* announces that, attention having been drawn of late to the evil results which follow the making up of medical prescriptions by druggists not sufficiently qualified, steps have been taken by the Pharmaceutical Society of Victoria to secure the passing of a Pharmacy Bill during the next session of Parliament. At a meeting of chemists and druggists recently held in Melbourne, it was decided that a Bill should be sketched out by the Council of the Society, and that the Government should be asked to draft it and adopt it. The object of the Bill will be to prevent, in future, any but thoroughly competent men from acting as chemists and druggists.

In Dr. Lankester's Annual Report of Inquests held by him in 1868-9, he calls attention to the fact that poison ranks third in frequency among the means of suicide. It appears also that a considerable change has taken place in the selection of poisons by intending suicides. He says that cyanide of potassium, which is used in enormous quantities by photographers, and may be purchased without difficulty, has been the poison most frequently used during the last seven years. Oxalic acid, which stands next, is used by shoemakers, saddlers, and harness-makers. The use of opium for the purposes of suicide is on the decline, owing to the difficulty of procuring a sufficient quantity of that drug. The same remark applies to hydrocyanic acid. Then comes oil of bitter almonds, rarely, if ever, the cause of accidental poisoning. Next sulphuric and hydrochloric acids, employed by metal-workers and brass-finishers. Vermin powders and preparations of strychnine stand lowest on the list, only two cases of poisoning by these agents having been recorded during the last seven years.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

January 18th, 1871.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Southall.

FIRST, OR PRELIMINARY EXAMINATION.

Two hundred and ninety-eight Candidates were examined; the following two hundred and ten passed, and were registered as

APPRENTICES OR STUDENTS.

	King, Horatio Alfred	Norwich.
	Hilston, David P.	Lanark.
	Wright, Alfred	Stowmarket.
	Davies, David	Merthyr Tydvil.
	Dunn, Henry	Shipley.
	Green, Thomas	Belfast.
	Kendle, Frederic Wellesley	London.
	Knight, John Tomlinson	Nottingham.
Equal.	Frank, John	Whitby.
	Maddock, William Thomas	London.
	Ridgley, Thomas	Newport, I. W.
	Harrison, William Westrop	Wisbeach.
	Beardsley, James	Nottingham.
	Wylde, James Harold	Manchester.
	Hargrave, Spencer	Manchester.
	Price, David	Merthyr Tydvil.
	Wright, Thomas David	Lancaster.
	Mellor, Thomas	Bury.
	Prince, George Frederic	Oxford.
	Dawson, Theophilus M. F.	Hull.
Equal.	Baxter, Thomas Moore	Wisbeach.
	Davidson, James Bruce	Ellon.
	Reddish, Augustus	Patricroft.
Equal.	Barclay, John	London.
	Jessop, John Arthur	Willenhall.
	Long, Theophilus H. B.	Brighton.
Equal.	Banks, William Orton	Levenshulme.
	Davies, John	Llanelly.
	Lloyd, Llewellyn	Oxford.
	Shepherd, Alexander Moir	Aberdeen.
	Smart, Charles Frederic	Littlehampton.
Equal.	Auld, James	Ellon.
	Oxley, Herbert Lister	Leeds.
	Thomson, James	Ellon.
	Elliman, Frank Samuel	London.
	Fortnam, Frederic Henry	Willenhall.
Equal.	Bond, Frederick William	Yarburgh.
	Colley, John	Ripon.
	Challinor, Samuel MacMillan	Bolton.
Equal.	Jenkins, Thomas Morgan	Merthyr Tydvil.
	Low, James	Ellon.
Equal.	Brunt, Francis	Ashby-de-la-Zouch.
	Fentiman, Charles James	London.
	Larder, Herbert	Horncastle.
	Taylor, George	Brinsley.
	Wheeler, Albert	Southsea.
	Worfolk, George William	Leeds.
Equal.	Coxon, William Arthur	Birmingham.
	Crowther, William Charles	Tickhill.
	Nicholl, Isaac Waugh	Belfast.
	Yates, Ebenezer	Manchester.
Equal.	Goyne, William Stephens	Redruth.
	Landon, Charles Edwin	Stourport.
	Pain, Arthur	Bury St. Edmunds.
	Price, Charles William	Abergavenny.
	Ewing, Gordon Clunes	Yarmouth.

Equal.	Davies, David	Newcastle Emlyn.
	Goss, Walter Herbert	Barnstaple.
	Herbert, John	Kingston-on-Thames.
	Herring, Augustus	London.
	Jones, Charles William	Ashby-de-la-Zouch.
	Joss, George	Aberdeen.
	Newton, Thornton A. C.	Devonport.
	Owen Phillip	Carmarthen.
	Robinson, Herbert	London.
	Troake, Marler Hamilton	Kingsbridge,
	Green, James Wiles	Wisbeach.
	Bowling, John Henry	Pembroke Dock.
Equal.	Almgill, John	Bedale.
	Bailey, Richard John	Spalding.
	Chitty, Frederick	Titchfield.
	Dyer, Henry Edmund	Wallingford.
	Hall, Edwin	Weston-super-Mare.
	Knight, William	Nottingham.
	Pearce, Frank T.	London.
	Phillips, John Edwards	Cheltenham.
	Plant, Frank George	Ashton-under-Lyne.
	Strickland, Augustus James	London.
	Greensill, William Joseph	Birmingham.
Equal.	Brookes, Alfred	Birmingham.
	Collier, Arthur Thomas	Newport Pagnel.
Equal.	Jamieson, Wallace	Tiverton.
	Pybus, John Alfred	Stockton-on-Tees.
Equal.	Corbett, Matthew David	Bridgend.
	Hunter, Frederick Neish	Durham.
	Pain, Edwin	Dover.
	Summers, Frank	Durham.
	Wardle, Thomas	Ashbourne.
	Huggett, Sydney	Lancaster.
	Sparshott, Harry	Birmingham.
Equal.	Hugo, Richard	Bideford.
	Jaques, John Charles	Howden.
Equal.	Hookes, Robert	St. Asaph.
	Lilley, John Henry	Staveley.
Equal.	Grimble, Albert	Boston.
	Morgan, William	Swansea,
	Norton, Thomas	Stafford.
	Smart, Robert Henry	Wisbeach.
	Stacey, William Henry	Stockport.
	Vigis, Joseph Lewis	Shepton Mallet.
Equal.	Clegg, Edmund	Manchester.
	Litchfield, John	Longton.
	Wade, James Henry	London.
Equal.	Burrows, Charles William	Alfreton.
	Greenwell, William	Gateshead.
Equal.	Blaymire, Thomas Croskell	Kendal.
	Lewis, Edward	Tenby.
Equal.	Dale, George Edgar	Colchester.
	Delcock, Joseph Austin	Ripon.
	Osborn, William Henry	Tewkesbury.
	Parker, John Wortley	Barnstaple.
	Stephens, Stephen	Llandilo.
	Turner, Francis James	Doncaster.
Equal.	Snowdon, Anthony	Manchester.
	Stamford, Frederick	St. Austell.
	Wedge, George Daller	Alresford.
	Wilks, Maurice	Leeds.
Equal.	Cowgill, Brian Horatio	Manchester.
	Greasley, John	Borrowash.
	Hesford, Everit	Manchester.
	Simpson, Robert George	Stowmarket.
	Frost, John	Abergavenny.
Equal.	Davies, Richard Morgan, jun.	Carmarthen.
	Gossling, William Richard	Wimborne.
	Hinds, Howell David	Pontardulais.
	Irving, Thomas Stableforth	Spalding.
	Keeble, Sam Henry	Leeds.
	Rose, George William	Spilsby.
	Sibson, William	Carlisle.
	Smith, Richard Fox	Barton-on-Humber.
	Burd, Frederick John	Liverpool.
Equal.	Cavenagh, John	Dublin.
	Evans, Thomas Mould	Derby.
	Portway, John Bernard	Bury St. Edmunds.
Equal.	Breadner, Charles Gibson	Manchester.
	Capes, John H. C.	York.
	Colling, Robert	Stockton-on-Tees.
Equal.	Bridges, Ashley Colston	Cleobury Mortimer.
	Collier, William James	Reading.
	Cookson, William	Eastbourne.
	Haller, Frederick William	Hull.
	Hardwick, Stewart	Sleaford.
	Lloyd, John Jenkin	Llanelly.
	Pickard, Henry	Barnstaple.
	Prebble, John George	Folkestone.
	Saville, William	Leeds.
	Shaw, Stephen	London.
	Thompson, Thomas	Darlington.
	Willson, Alfred	Landport.
	Wright, Bentley Warren	Grantham.
Equal.	Fraser, Alexander	Forres.
	Marsden, William	Manchester.
	Alcock, Joseph Pitman	Worcester.
Equal.	Babb, James	Taunton.
	Bolton, Charles Alfred	Nottingham.
	Dodge, William	Stockport.
	Gibbs, Henry	Aylesbury.
	Iredale, Thomas	Leeds.
	Montille, Louis Léonce	Mauritius.
	Norton, Charles	Plymouth.
	Williams, Robert	Llangefni.
Equal.	Dutchman, Walter	London.
	Fox, Albert	Atherstone.
	Woods, John	Southampton.
Equal.	Hammond, Henry	Bradford, Yorks.
	Matcham, Edward	Norwich.
Equal.	Bunn, Robert Edward	Ipswich.
	Butler, George	Darlaston.
	Crewe, Joseph Edward	Ashton-under-Lyne.
	Culley, Frederick John	Exeter
	Ireland, William Henry	Topsham.
	Mackenzie, James	Perth.
	Peacock, Percy	London.
	Revell, John	Plymouth.
	Roberts, David	Rhyl.
	Staning, Walter	Hull.
	Stott, Charles Thomas	Sowerby Bridge.
	Whitehouse, Thomas Arthur	London.
Equal.	Urwin, Matthew	South Shields.
	Wallis, Owen	Hastings.
Equal.	Blackwell, Frederick William	Birmingham.
	Dobson, Thomas Henry	Skipton.
	Rees, Alfred	London.
	Rendall, Stanby Morton	Torquay.
Equal.	Chapman, Frederick	London.
	Knight, James West	St. Ives, Hunts.
	Laycock, John	Skipton.
	Rogers, William	Bilston.
Equal.	Beaton, William	Fraserburgh.
	Burnett, William George	Hull.
	Cattell, Thomas Bellamy	Coventry.
	Clark, Matthew Gunning	London.
	Colley, Walter	Birmingham.
	Cooke, Isaac	Liverpool.
	Cowley, Henry Williamson	Nottingham.
	Harrold, Thomas Kilburn	Northampton.
	Irwin, Thomas	Aldershot.
	James, Isaac Rowland	Aberystwith.
	Kiddle, Isaac	Taunton.
	Knight, Lindsey	Cheltenham.
	Lawe, James Henry	Plymouth.
	Martlew, Thomas	Carlisle.
	Milton, William Edwin	Chew Magna.
	Rees, Samuel Lawrence	Hayle.
	Squirrell, John Newton	Manchester.
	Turner, Joseph Kitchen	Whitehaven.
	Welcher, Robert Mitchell	Chatteris.
	Whitefoot, Thomas	Ludlow.
	Wilson, Thomas	Blackheath.
	Wright, John Henry	Leeds.

The following is a list of the towns in which the examinations were held, with the number of candidates annexed:—

Aberdeen	5	Lanark	1
Abingdon	1	Lancaster	2
Altrincham	1	Leeds	11
Andover	1	Leighton Buzzard	1
Ashton-under-Lyne	3	Lewes	1
Ashby-de-la-Zouch	2	Lincoln	2
Aylesbury	1	Liverpool	4
Barnstaple	4	London	37
Bath	1	Manchester	16
Belfast	3	Merthyr Tydfil	6
Bewdley	2	Newark	1
Birmingham	8	Newcastle-on-Tyne	2
Bolton	1	Newport (I. of W.)	1
Boston	3	Northampton	4
Bradford	3	Norwich	3
Bridgnorth	1	Nottingham	9
Brighton	1	Oxford	2
Bristol	4	Pembroke Dock	2
Bury St. Edmund's	2	Perth	1
Cambridge	1	Peterborough	3
Cardigan	2	Plymouth	3
Carlisle	4	Poole	4
Carmarthen	4	Portsmouth	2
Carnarvon	2	Reading	1
Cheltenham	1	Richmond	1
Chesterfield	1	Ripon	2
Colchester	1	Ruthin	1
Coventry	3	St. Austell	1
Darlington	2	St. Ives (Cornwall)	1
Derby	2	Scarborough	1
Devonport	1	Sheffield	1
Doncaster	5	Sleaford	1
Dorking	1	Southampton	1
Dover	4	South Shields	2
Dublin	1	Stafford	1
Dudley	1	Stamford	5
Durham	3	Stockport	4
Ellon	4	Stockton-on-Tees	2
Evesham	1	Stoke-on-Trent	1
Exeter	2	Stourbridge	2
Farnham	2	Stowmarket	2
Flint	1	Swansea	5
Forres	1	Taunton	5
Frome	1	Tenby	1
Grantham	1	Tewkesbury	1
Halifax	1	Thirsk	1
Hartlepool	1	Tiverton	1
Hereford	1	Torquay	1
Holywell	1	Truro	1
Horncastle	3	Wallingford	1
Huddersfield	2	Warrington	1
Hull	9	Wednesbury	3
Huntingdon	1	Whitehaven	1
Ipswich	1	Winchester	1
Kendal	1	Wolverhampton	2
Kidderminster	1	Worcester	1
King's Lynn	2	York	1

The Questions for Examination were as follows:—

Time allowed: Three Hours.

LATIN.

Translate into English two at least of the following sentences:

1. Flumen est Arar, quod per fines Æduorum et Sequanorum in Rhodanum influit incredibili lenitate, ita ut oculis, in utram partem fluat, judicari non possit: id Helvetii, ratibus ac lintribus junctis, transibant.

2. Quod si veteris contumeliæ oblivisci vellet; num etiam recentium injuriarum, quod eo invito, iter per provinciam per vim tentâssent, quod Æduos, quod Ambarros, quod Allobrogas vexâssent, memoriam deponere posse?

3. Fiat haustus, quartâ quâque horâ capiendus. Ut effectus sudorificus augeatur, adde singulis haustibus antimonii potassio-tartratis grani quartam partem.

4. Rosæ prius divulsæ aquam superinfunde, dein acidum immisce. Macera per horas duas, et liquorem cola; denique saccharum adjice.

5. Give the genitive and dative endings, singular number, of nouns of the fifth declension, and state the gender to which they belong.

6. Decline *idem*, the same.

7. In what case do you put a noun of time when it answers to "how long"? Give an example in Latin.

8. State to which conjugation each of the following verbs belongs, and give the second person singular, present tense, indicative mood: *debeo*, *repurgo*, *scribo*, and *audio*.

9. What case does *esse* take after it? Give an example.

ARITHMETIC.

10. Multiply 2710432 by 375.

11. If I gave £187. 3*s.* 3*d.* for 25 cwt. 3 qrs. 14 lb. of Senna, what did I pay per lb.?

12. Reduce $\frac{1\frac{1}{2}}{12}$ of $\frac{1\frac{3}{4}}{14}$ of $\frac{2\frac{1}{2}}{29}$ to a single fraction.

13. Add $5\frac{2}{3}$, $6\frac{7}{8}$, and $4\frac{1}{2}$ together.

14. What is the difference between three-tenths of an unit and 64 ten-thousandth parts of an unit?

ENGLISH.

15. Into how many parts is English grammar divided? Name them.

16. How many articles are there, and where are they used?

17. How do nouns ending in *ch* form the plural, also nouns ending in *ch* sounding *k*? Illustrate by examples.

18. Give the past tense and past participle of the following irregular verbs: fly, hew, drink, slay, and speak.

19. Correct the following: If she were the wittier, he were the wisest of all.

20. Write from 15 to 25 lines upon *one* only of the following subjects:—
   a. The importance of early mental cultivation.
   b. The advantages of having good companions.
   c. The blessings of peace.

Certificates presented by the undermentioned were accepted in lieu of this Examination:—

Richards, James Griffiths .... Newport, Mon.
Savell, Edward Pearce .... Southampton.
West, John Leaver .... Ashby-de-la-Zouch.
Wright, Conrad William .... Tewkesbury.

Four Candidates presented themselves for the Major Examination, and Sixteen for the Minor; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

*Diaper, Albert .... Bury St. Edmunds.
*Reinhardt, William Tynedale .. Leeds.
Sherburn, Thomas .... Harrogate.
Sandiland, Robert Burgess, jun. Bicester.

MINOR (as Chemists and Druggists).

*Catterns, Heneage Parker .... London.
*Troake, Marler Hamilton .... Kingsbridge.
*Hughes, Evan Grismond ...... Llandilo.

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* Passed with honours.

	*Humphry, Horatio	Southampton.
	*Brown, James	Ampthill.
	Overton, Charles Arthur	Horncastle.
	Smith, John Francis	Scarborough.
	Chitty, Frederick	Titchfield.
	Parker, John Samuel	Peterborough.
Equal.	Jones, Alfred	Northampton.
Equal.	Watmough, George Capes	Caistor.
	Atkinson, David	London.
	Francis, William	Carmarthen.
	Arundel, Matthew Henry	Penge.
	Coles, Samuel John	Liverpool.

The above names are arranged in order of merit.

* Passed with honours.

Provincial Transactions.

THE SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Second Annual Meeting was held on Wednesday evening, January 11th, in the Rooms, Music Hall; Mr. Wilson, the President, in the chair.

The Secretary read the following Report:—

"In presenting the Second Annual Report, the Council have great pleasure in being able to offer their congratulations upon the prosperous condition of the Association. The number of Members and Associates shows a slight increase upon that of last year, the losses by resignations and death having been replaced by new Members; and we have every reason to believe that the third year will be commenced by a considerable addition to our numbers.

"The Council desire to acknowledge the services Mr. Ward has rendered to the Association by gratuitously giving a course of chemical lectures (prepared at great expense of time) to the students during the Summer Session. An attempt was also made to form a botanical class, but proved unsuccessful. At the ordinary monthly meetings lectures have been given upon—

"'The Detection of Poisons,' by W. Baker, Esq., F.C.S.

"'Nitrous Oxide, or Laughing Gas,' by Dr. Harrison, F.C.S.

"The Winter Session was inaugurated with an address by Dr. J. C. Hall, Oct. 19th, since which the following lectures have been given:—

"'The Nightshades,' by Dr. Griffiths.

"'The Laws of Heat,' by W. Baker, Esq., F.C.S.

"'The Dangerous Gases of Coal Mines,' by Mr. Bradwell, an Associate of the Society.

"It was decided to hold fortnightly meetings, trusting that Associates would be induced to read short 'Papers,' and to give opportunity for discussion; but, from unavoidable causes, they have not been carried out.

"A Latin Class, conducted by Mr. Fox, and a Chemical Class, by Mr. Allen, have been organized, and are now in active operation; the number in each being about twelve.

"Prizes have been offered by members of the Council, for which the students are invited to compete at the end of the course. Strenuous efforts have been made by the Council to extend the usefulness of the Association, by throwing open these classes to the Assistants and Apprentices of neighbouring towns; and, with that object, deputations of the Council visited Rotherham and Chesterfield, and canvassed all the chemists and druggists in those places.

"Notwithstanding adverse circumstances, their success was such as to augur well for the future of the Association; and the Council have every confidence that Sheffield will become the centre of pharmaceutical education for the district.

"The Council are indebted to Mr. James Allport, General Manager of the Midland Railway Company, for allowing the Chesterfield students to travel to and fro at reduced fares.

"The Library now contains many valuable works for study and reference; seventeen volumes have recently been purchased. The Pharmaceutical Journal, the gift of the Council of the Pharmaceutical Society, and the *Lancet* are now weekly placed upon the table of the reading-room.

"Valuable donations to the Library and Museum have been received from the President, Mr. E. Wilson, of a large Smee's galvanic battery; from Mr. Nathaniel Booth, Rotherham, of thirty-seven volumes of the *Lancet* and seven volumes of Bell's 'Surgery;' and from Messrs. Cubley and Preston of a small cabinet of mineral specimens.

"The Council, in retiring from office, solicit for their successors the support of the masters, not only in contributing to the funds of the Association, but by giving every facility for their assistants and apprentices to attend the classes and reading-room.

"They look back upon the operations of the past as very successful; they see an increasing desire on the part of the students to avail themselves of the advantages the Society offers; and they have every confidence that the educational department will be placed upon a firm basis."

Balance Sheet.

General Account.

Dr.	£.	s.	d.
By Balance from 1869	10	19	2
,, 55 Members, at 10*s*.	27	10	0
,, 44 Associates at 2*s*. 6*d*.	5	10	0
,, Mr. Wilkinson's subscription	1	1	0
,, Balance from Dinner	0	7	0
,, Bank Interest	1	0	0
	46	7	2

Cr.	£.	s.	d.
To Rent, Gas, Coal, Advertising, Printing, etc.	30	19	0½
,, Bank Commission	0	1	1
,, Secretary's Petty Cash	2	17	5
,, Balance in hand	12	9	7½
	46	7	2

Furnishing, Museum and Library Account.

Dr.	£.	s.	d.
By Balance from 1869	30	10	10½
,, Mr. Watson's Donation	1	1	0
	31	11	10½

Cr.	£.	s.	d.
To Books, etc.	8	0	3
,, Balance in hand	23	11	7½
	31	11	10½

Microscope Account.

Dr.	£.	s.	d.
By Balance from 1869	4	18	4

Cr.	£.	s.	d.
To Lamp Glasses	0	2	6
,, Balance in hand	4	15	10
	4	18	4

Total Balance in hand.

	£.	s.	d.
By General Account	12	9	7½
,, Museum ,,	23	11	7½
,, Microscope ,,	4	15	10
	40	17	1

Mr. Barber proposed, and Mr. Cubley seconded, that the Report, as now read, be confirmed. Carried unanimously.

The following officers were elected for the ensuing year:—*President:* Mr. J. T. Dobb. *Vice-Presidents:* Mr. G. B. Cocking and Mr. Horncastle. *Treasurer:* Mr. Radley. *Secretary:* Mr. H. W. Maleham. *Auditors:* Mr. Crawshaw and Mr. Priestley. *Council:* Messrs. Cubley, Hill, Huddlestone, Hudson, Preston, Ward, and Wilson.

Mr. COCKING proposed, and Mr. WILSON seconded, That Rule 12 shall be altered, and read as follows:—"That the ordinary monthly meetings for the transaction of business be held on the first Thursday in every month." Carried.

Messrs. Newham and Strain were elected Members, and Messrs. Jervis, Thwaites, Wood, Birch (Chesterfield), Aldred (Chesterfield), and Hesk (Rotherham), Associates.

Cordial votes of thanks to the retiring President, and each of the other officers, for their services during the past year, concluded the business of the meeting.

HALIFAX CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Annual Meeting of the members of the above Association was held last month, but with only a moderate attendance. After supper the Secretary commenced the business of the evening by reading the report, viz.

"The usual meetings in the early part of the year were mostly occupied in the consideration of the intention of the Council of the Pharmaceutical Society to introduce very stringent regulations in the storage and sale of poisons. These were unanimously disapproved of, and your Committee, in conjunction with many others, protested against them. These protests and agitations resulted in the defeat of the intended plan, and in such a change in the Council of the Society unequalled in its history.

"Two valuable papers have been read during the year: one on Materia Medica, by Mr. Shaw, and the other on the proposed Poison Regulations, by Mr. Brook. It is a subject of regret with your Committee that the number of papers have been so few; the chief cause of this is the slender attendance at the meetings, whilst the apathy of a great number of members gives no encouragement to those who are able and willing to undertake the preparation of an elaborate paper.

"During the year the Committee have succeeded in establishing a class in botany. The procuring of a suitable teacher was a matter of some difficulty which has been so well overcome, that the pupils express great confidence and satisfaction with the tutor. The Committee have decided to offer for competition a prize, to be awarded at the examination next month.. An effort has been made to form a class in materia medica, which only failed through the want of a suitable teacher. The classes in chemistry and Latin have this year improved in numbers and in regularity of attendance, and there is every reason to believe that at the examination in the ensuing spring, the young men will distinguish themselves. It is to be deeply regretted that there are many young men who do not avail themselves of these great advantages, a neglect which will seriously imperil their interests in the future, and which now prevents them being as reliable and useful in daily duties as they otherwise would be. Your Committee earnestly hope that this last consideration will have its weight with the members, and that they will insist upon every one of their young men attending these classes. Whilst the Committee have done their utmost to complete a thorough system of technical education, so that the future members of the trade will be men of undoubted stamp, they have not left untouched some of the grievances of the present members of the trade, and have succeeded in shortening the hours of business. A more uniform rate of retail charges has also received a large amount of attention, but the near approach of the Annual Meeting compelled its postponement till next year."

Mr. JESSOP proposed and Mr. BROOK seconded that the report as read be adopted. Carried.

Mr. SHAW proposed, and Mr. FARR seconded, that Mr. Stott be the President for the ensuing year.

Mr. STOTT in reply thanked them for the honour they had conferred upon him. He regretted that the continued indisposition of their late President prevented him from any longer occupying that position. He must express his great surprise that numbers of the members were simply content with their names being on the list, and very rarely attending any of the meetings. If there were larger attendance, and more earnestness displayed by the members, the Committee would possess greater influence in the removal of many trade grievances, and in advancing the education of their youths. During the year the principal novelty in medicine had been the discovery of the usefulness of chloral hydrate, on which he commented, as also on the various papers read before the Pharmaceutical Conference at Liverpool, and expressed his approval of the desire of the Association, that the names of Preparations should be truthful. With respect to patent medicines, he thought the trade was glutted with quackery, and he would rather see a diminution than an increase in that direction. He hoped a plan for regulation of poisons would be framed that would protect the public and be acceptable to the trade. Mr. Stott concluded his remarks by stating that the Committee should gladly have his assistance in furthering their efforts in the spread of technical education amongst their young men.

Mr. HEBDEN, Hon. Sec., regretted that his numerous engagements prevented him any longer filling the above post. He had great pleasure in moving that Mr. Brook be his successor, which was carried unanimously, as well as the election of Mr. J. Brierley as Treasurer.

The question as to how an increased interest and attendance at the monthly meetings could be brought about, after a long discussion, ended in the following motion being carried:—"That in the absence of pressing business at our meetings, each member in turn be expected to introduce matters of special interest to the trade, sufficient notice being given to prepare for such meeting."

A vote of thanks to Mr. Dyer for two years' services as President, to Mr. Hebden, as Hon. Sec., and to the President, brought the evening's proceedings to a close.

First Monthly Meeting, held January 12, 1871; Mr. JESSOP, Vice-President, in the chair.

Mr. HEBDEN introduced the subject of the late examination of the Botany Class, and presented the Report of the Examiner, Dr. Dougall. The Report stated there were six questions given, valued at 65 marks. Only one youth answered the six with any degree of correctness, gaining for himself 32 marks; the next highest number being 29. Mr. Hebden thought the students had hardly come up to the mark the Association could have wished, and advised that the prize offered to the successful pupil should be reduced in value to that originally intended.

Mr. FARR agreed with the last speaker, and suggested a more valuable one next Session.

Eventually Mr. JESSOP moved, and Mr. J. B. BRIERLEY seconded, "That a prize of not less value than 5*s.*, in the form of a scientific work, be presented to Wm. Ferrand, the successful pupil.

The question of forming a Materia Medica Class then engaged the attention of the members.

Mr. HEBDEN informed the meeting that Dr. Dougall had very handsomely offered his services to conduct it, if a sufficient number of members could be obtained. Several gentlemen expressed a strong desire that such a class should be formed, deeming it of more importance than botany, and as Dr. Synnott and Mr. Shaw have both kindly offered valuable prizes in connection with it, the latter gentleman having also volunteered to conduct an examination, it is thought a good class may be formed next Session.

The Treasurer presented a cash statement showing a balance in favour of the Association of £4. 5*s.* 3*d.*, which was ordered to be entered on the minutes of the Association. A vote of thanks to Dr. Dougall for his kindness in conducting the examination of the the students in botany ended the meeting.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Seventeenth Session.

The Seventh Meeting of the Session was held in Anderson's University on Wednesday evening the 11th inst.; Mr. T. Davison, President, in the chair. The Secretary announced receipt of the Pharmaceutical Journal and *Chicago Pharmacist* as donations. Messrs. James Dickie, Crocket, Brodie, M'Auley and Wallace were elected members.

R. Carter Moffat, Esq., Ph.D., F.R.S.S.A. (honorary member), then delivered a highly interesting lecture on "The Detection of Alum in Bread." He first explained some of the many processes recommended by chemists for this purpose, stating that for many years it was one of the most difficult problems to solve. He then went on to say, that some months ago he had been engaged, professionally, to report as to whether alum was really present in some breads, as alleged. His attention was thus drawn to the untrustworthiness of some of the tests and the awkwardness of others, and he endeavoured to remedy the matter if possible. After performing nearly two hundred experiments, however, the matter seemed to him as far from solution as ever. At length he came upon the process known as Mr. Horsley's, of Cheltenham, which recommends that a piece of bread be placed in vinegar for a short time, the vinegar then to be strained off, and a little ammonia added to the clear liquor, to neutralize the acid; an alcoholic solution of logwood was then to be added, which, it was stated, gave the liquor a blue coloration when alum was present. Fourteen loaves, besides some samples of flour, had been given him for analysis; and, according to Mr. Horsley's process, every one of these contained alum. But on experimenting further he (the lecturer) found that the blue coloration was produced when *no* alum was present, which led him to the discovery that by far the most reliable test for detecting the presence or non-presence of alum in bread or flour, was the simple alcoholic solution of logwood, without any of the burning, boiling, or other processes. He used 120 grains of ordinary chip logwood, and digested it for eighteen hours in 8 ounces of methylated spirit and filtered it. When the solution is brought in contact with bread or flour *free* from aluminum, a pale yellow or straw colour is produced, but if aluminum be present the colour turns out a dark red. With this test he had found that only *one* of the fourteen loaves contained alum, showing that this substance was not so extensively used for whitening bread as had been given out by many chemists and others. The lecturer performed some experiments in illustration of his subject, and at the conclusion was awarded a hearty vote of thanks.

The proposed poison regulations were then considered, and in course of a short discussion—in which the feeling semed to prevail that chemists generally could not object to regulations of some kind being made in regard to the keeping of poisons—it was thought advisable to oppose them becoming law in their present form, until such time as the Government should see fit to place the same restrictions upon surgeons and others who keep open shop for the dispensing of medicines. A member stated that he thought if the druggists would agree to the regulations independent of the surgeons altogether, the public would have greater confidence in going to the chemist for their drugs; but the idea was repudiated by most of the members, on the ground that surgeons who had shops never allowed their prescriptions to be dispensed elsewhere if they could avoid it; and further, because in many of the large towns in Scotland surgeons had the cream of the drug business in their own hands; in Glasgow particularly fully two-thirds of the drug retailers being medical practitioners who, it was understood, would be entirely exempt from the restrictions. The President and Secretary were instructed to communicate with some of the other associations, to ascertain what action was being taken by them in the matter, and also to write to the medical department of the Privy Council, explaining the position in which the Glasgow chemists will be placed in the event of the regulations, as at present proposed, becoming law. The discussion was then adjourned till next meeting.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture IV.—continued.

Amongst the processes which are detrimental to the quality of wine, I have already mentioned the excess of air having access to it. That is the one which is most known, and against which people least need to be cautioned, but it has been found by wine-growers and wine-makers, especially in the case of higher-class wines, like those of Burgundy and some other districts, are liable to particular maladies which produce evils, each one quite peculiar and different from the others. Amongst these maladies, the first and simplest of all, is acetification, or the transformation of the alcohol into acetic acid. That is one which is so well known now, and so well understood, that, I think, wine-growers are well able to guard against it with tolerable completeness. By the use of a microscope, these little acetic cells on the surface of the liquid would at once be seen, and you would know, of course, that there would then be a tendency in the wine to pass over into acetic acid, and that, unless those cells are removed, or if they are present, unless oxygen be excluded,—because the presence of the cells does not of itself make the wine into vinegar, it is necessary that they should be present with a continuous supply of air,—so that if they are removed, or if you prevent a supply of air, that malady is arrested or cured. But there is another malady which is well known, and frequently spoken of amongst wine-growers as the "turning" of wine. It is a process which is, in its general features, something analogous to acetification, but chemically it is very different. When the wine is put into casks, it begins to give off gas, and in French they call it *la pousse;* it pushes out the ends of the casks, and, if a hole were made, the wine would be ejected with considerable force. M. Pasteur has examined not only the wine itself when undergoing this process, but also the deposit, the little solid particles which are present in it, and he has found two things which are correlative to one another,—in the first place, that there is always present in wine which is suffering from this malady certain little films, which can be seen quite distinctly by the microscope, and which are different from any particles found under any other conditions, and which he therefore believes to be little organic bodies, just as much as in the alcoholic ferment or acetic ferment, and he calls them the ferment of the turning or *la pousse.* That is one fact which is established. These little particles are compared in their structure to little bamboos, as they consist of little straight joints one at the end of the other, the length being considerably greater than the diameter; they are not little spherical matters, like the wine ferment, and their diameter is exceedingly small, being about the one-thousandth part of a millimetre. That is one fact which M. Pasteur has established, and the other is this, that while this process is going on, lactic acid is present; and his explanation of the malady consists in attributing it to the presence of this particular parasite in the wine, which is transforming the materials of it into lactic acid, with no doubt some other product, at the same time. Another malady which not unfrequently occurs in wine, is ropiness; and it is said that wine suffering acutely from this malady might almost be mistaken for oil, when poured from one vessel to another, so thickly does it flow. That peculiarity is attributed solely to the presence in it of a number of little films peculiar to it; but they are very different to the eye, and very different also in their functions from the films which constitute the active agency of the process I have just mentioned, that of turning. These little films are like little strings of beads, little spherical particles, a great number of them joined end to end. The particular nature of the transformation which the wine undergoes has not been investigated, but, as far as M. Pasteur's observations go, and they are very numerous and accurate, these little strings of beads are really active agents in that particular transformation which constitutes ropiness, and which destroys wine; for, if it cannot be arrested, the wine ceases to be drinkable, and becomes worthless. The fourth malady, which is also one of frequent occurrence, is one which produces a bitterness, and it is said that this malady is one to which wine is subject in its youth and also in its old age; that it sometimes occurs when wine is two or three years old, and sometimes, though in a less acute form, when it is very old. Here, also, a particular parasite is present, little organized particles, which have been minutely described and depicted, and they are found in various states, some differing very much from the others. Some pictures of the parasites which constitute the bitter ferment are like little branches with a number of little knobs or warts upon them, and some of them are clear and transparent, whilst others are coated with an incrustation. M. Pasteur, however, has already shown that the little knobs or warts upon them, and the incrustation which frequently occurs, are nothing else than foreign matter deposited upon them, that when the parasite dies it is liable to be encrusted, but that in a pure state it is clear and transparent. This parasite, when it occurs in young wine, renders it completely worthless, but when it occurs in old wine, it only gives such an amount of bitterness as is not fatal to the wine, and is, to a certain extent, exceedingly common, so that it is considered almost a natural accompaniment of old wine. Amongst the remedies for these processes is sulphurous acid, which, of course, would destroy parasites when they are present. We can quite understand that wine which has got germs of these little organic beings present in it is liable to undergo these injurious changes if the germs are allowed to develope themselves, but that it would be free from all such tendency if, by any poisonous material, the little germs or organisms were destroyed. We can also understand that any mechanical process of filtration, or of forming in the liquid a gelatinous mass which will subside and carry down with it any fine particles which may be present in suspension, but which are too light to settle of themselves, would effect the same object; and it is quite intelligible, that if Pasteur's view is correct, that these little solid particles are the active agents of those transformations, the processes which have commonly been in use for preventing the detriment of wine by such changes should be effectual; we can quite see why they ought and indeed must be effectual, but, at the same time, we cannot help seeing that they would be very liable to be incomplete. Of course, it is a matter of chance whether, if you form a precipitate in the liquid, the little light particles would all happen to be caught by some of this precipitate when going down. We should expect that any such process would be efficacious in diminishing the evil, but not in arresting it completely, and I believe that is exactly what is found by experience.

(*To be continued.*)

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society,* at 9 P.M.
London Institution, at 4 P.M.—"On the First Principles of Biology." By Prof. Huxley.

TUESDAY ......*Royal Medical and Chirurgical Society,* at 8.30 P.M.

WEDNESDAY...*Society of Arts,* at 8 P.M.—"New Paper-making Materials and the Progress of the Paper Manufacture." By P. L. Simmonds.
London Institution, at 7 P.M.—Conversazione. "On Dust and Disease." By Prof. Tyndall.

THURSDAY......*Royal Society,* at 8.30 P.M.
London Institution, at 7.30. P.M.—"On the Action, Nature, and Detection of Poisons." By F. S. Barff.
London Chemists' Association, at 9.30 P.M.—"Preservation of Vegetable Substances." By E. Beynon.

FRIDAY ....*Royal Institution,* at 8 P.M.—Lecture by Professor Odling.
Quekett Club, at 8 P.M.

SATURDAY......*Royal Botanic Society,* at 3.45 P.M.

Parliamentary and Law Proceedings.

A Druggist acting as an Accoucheur.

At an inquest, held on Wednesday last, before the Brighton Borough Coroner, to inquire into the death of a young woman shortly after her confinement, evidence was given gravely implicating William Henry Funnell, a chemist and druggist.

The deceased, it appeared, had made an arrangement with Mr. Funnell to attend her during her confinement, it being alleged that he represented to her that he had been in the habit of attending night cases and cases of emergency for Mr. Tuke, surgeon, with whom he formerly lived as dispenser. When the time came, symptoms of unusual difficulty set in, with which he was evidently quite incompetent to cope. After the lapse of some time he called in skilled assistance, and the delivery was effected, but the patient died half an hour afterwards from exhaustion.

Medical evidence was given to the effect that although the case was an unusual one, it was one that a skilled practitioner would have recognized and treated accordingly. Mr. Tuke denied that Mr. Funnell was justified in saying that he attended his night cases. He said that Mr. Funnell did attend several labours for him, in cases of emergency, while acting as his dispenser, but he invariably saw the cases afterwards himself, and Mr. Funnell always referred to him if any symptoms appeared which he could not understand.

The jury returned a verdict that the deceased had died through not having had proper medical attendance until too late, and requested the coroner to censure Mr. Funnell for his conduct in the matter.

This the coroner did, telling him that the only reason why the jury refrained from sending him for trial on a charge of manslaughter was that the case was an unusual one, and that he had devoted a great deal of time to it. If the jury had been a severe, instead of a very kindly and lenient one, he would have been committed for trial on the criminal charge, and thus put in a position of great peril.—*Brighton Daily News.*

Singular Case of Poisoning by Arsenic.

An inquiry has just taken place into a supposed case of poisoning by arsenic, which resulted in a farmer named Knowles, living at Tipp's End, Upwell, near Wisbeach, being committed for trial for the manslaughter of the child of a labourer. According to the evidence, the prisoner had prepared a little more than a peck of wheat with arsenic for sowing. This he mixed with two bushels of clean wheat and sent the whole to a mill to be ground. After it had been ground a small quantity of Knowles's grist remained in the mill and was mixed with other grist. The result was that several persons, after partaking of food prepared with this flour were seized with violent pains and sickness; all, with the exception of the child, however, recovering. Arsenic was discovered in the stomach of deceased and in some of the food that remained. Medical evidence showed that the child was suffering from bronchitis, but that its death was accelerated by the poison.—*Daily News.*

Review.

Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference, 1870. Churchill and Sons.

The British Pharmaceutical Conference have undertaken a very useful duty in the compilation of this work. At the present time, when the art of Pharmacy is everywhere making such rapid strides, it is more than ever necessary that the English pharmacist should be fully acquainted with the labours of his fellows both at home and abroad. But the whole record of pharmaceutical progress is of necessity distributed through a host of periodicals, issued in different countries and printed in different languages.

To compile from these scattered sources an annual report, which shall include in one volume a summary of all pharmaceutical papers, processes, preparations and formulæ published throughout the world during each year, is the task which the Conference has undertaken; and every one of our readers will at once recognize its importance and value. At the present time no work of the kind exists in this country. 'The Year-Book of Pharmacy,' which was started some five or six years ago, has ceased to exist. The Conference have adopted the title and general scheme of that publication, but with much greater chance of success; and the executive members deserve great credit for the judgment and zeal with which they have commenced their new enterprise.

The present volume includes nearly six hundred octavo pages, but of this number one-half is devoted to the Proceedings of the Pharmaceutical Conference at the Liverpool meeting. Of this portion of the work we need say little, except that the papers contributed to that meeting, which are here printed in full, display a large amount of scientific ability on the part of the members, and constitute a most important addition to Pharmaceutical literature. The Year-Book proper contains a large number of excellent abstracts from many important papers bearing on Pharmacy which have been published either at home or abroad during the past year. While the advancement in the science of Pharmacy is thus recorded, the practical utility of the volume is enhanced by numerous useful formulæ, which have been collected from various sources. Every one will regret to learn that the delay which has occurred in the publication of this book has been due to the serious illness of its talented and kindly editor, Mr. J. C. Brough. It is, no doubt, to this cause that we must also attribute some of the defects which are noticeable in the work. The arrangement of the matter, especially bears evidence of great haste, and is certainly not well done. The first section deals exclusively with American Pharmacy and recipes. The second section is devoted to English and Continental Pharmacy; yet it includes a long list of syrups for American drinks copied from an American Journal, and much further on in the book many very characteristic American formulæ are to be found. An abstract, entitled "Turpentine as an Antidote to Phosphorus," occurs in the Materia Medica section (pape 90); another, headed "Poisoning by Phosphorus,—Turpentine the Antidote," is placed among things which "do not admit of classification," and may be found at page 283. No reference is made from one to the other, and even in the Index they are not brought together. It is unnecessary to quote further instances of what occurs frequently throughout the volume.

The present work brings together so much matter of real scientific and practical value in a convenient compass, that it will be an undoubted acquisition to every pharmaceutical library; nevertheless, it can scarcely be said that the full programme of the Conference has been realized. We shall hope to see succeeding volumes present a still more perfect record of English and foreign pharmacy. Experience will probably lead to a more judicious selection of material. Many papers relating strictly to Pharmaceutical subjects seem to have been overlooked, while some of the matter included would have been considerably improved by curtailment. A celebrated author has compared our modern periodical literature to an inch of soap beaten into a hogshead of lather. It should be the business of a Year-Book to present the soap in its solid form. At the same time, however, that we candidly criticize what we conceive to be the weak points of the present volume, we cordially recognize the ability which has been displayed in an arduous task, and we confidently predict a useful career for the Year-Book of Pharmacy.

BOOK RECEIVED.

On a Localized Outbreak of Typhoid Fever in Islington during the Months of July and August, 1870, traced to the use of Impure Milk. By Edward Ballard, M.D. London: J. and A. Churchill. 1870.

Obituary.

CHARLES GUSTAVUS BISCHOF.

This well-known German chemist and geologist died at Bonn on the 30th of November. He was born near Nuremberg, in Bavaria, on the 18th of January, 1792, and received his education in the University of Erlangen, where he applied himself at first to the study of mathematics and astronomy, but subsequently abandoning this branch of science, he turned his attention to chemistry, becoming one of the most distinguished pupils of Professor Hildebrandt. In 1819 he was appointed Professor of Chemistry and Technology in the University of Bonn. An enthusiastic geologist, Dr. Bischof sought to discover in molecular action certain geological phenomena. His most important works are 'Physico-Statistical Descriptions of the Fichtelgebirge Mountain,' published in 1817: 'The Mineral Springs of Volcanic Origin in France and Germany, and the Mineral Springs of Roisdorf,' and a 'Treatise on the Interior Heat of the Terrestrial Globe.' The latter work, which appeared at Leipsic in 1837, was "crowned" by the Scientific Society of Holland. Dr. Bischof was a constant contributor to various scientific journals. His memoir on the 'Mode of Preventing Explosions in Coal Mines,' published in 1840, gained the prize of the Academy of Brussels. Of his other works the best known are 'Popular Letters to a Lady on the Natural Sciences,' 2 vols., Pforzheim and Bonn, 1840 and 1849; and 'Elements of Chemical and Physical Geology,' Bonn, 1847–50, a revised edition of which was published in English by the Cavendish Society.—*Times.*

The following journals have been received:—The 'British Medical Journal,' Jan. 14; the 'Medical Times and Gazette,' Jan. 14; the 'Lancet,' Jan. 14; the 'Medical Press and Circular,' Jan. 18; 'Nature,' Jan. 12; the 'Chemical News,' Jan. 13; 'Journal of the Society of Arts,' Jan. 12; 'Gardeners' Chronicle,' Jan. 14; the 'Grocer,' Jan. 14; the 'English Mechanic,' Jan. 13; the 'Chemist and Druggist' for January; the 'Doctor' for January; the 'New York Druggists' Circular' for January; the 'Brighton Daily News' for Jan. 11.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department,* 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[57.]—FLORIDA WATER.—As no other correspondent seems to have furnished "*Nemo*" (Sudbury) with a recipe for preparing Florida water, I send you the following from an American source:—

℞. Ol. Lavandulæ,
Ol. Bergamot,
Ol. Limonis, of each 2 drachms
Tincturæ Curcumæ,
Ol. Neroli, each 1 drachm
Ol. Mellissæ, 30 drops
Ol. Rosæ, 10 drops
Alcohol, 2 pints. LECTOR.

[94] and [111.]—YLANG YLANG.—The essence of *Ihlang-Ihlang* is distilled from the flowers of the *Unona odoratissima*, a large tree which grows in the Philippine Islands, the Straits of Malacca, and the Indian Archipelago. *Ihlang-Ihlang* (improperly spelt *Ylang-Ylang* by the Spanish residents) is the native *Tagal* name this tree bears in the Philippine Islands. The Malays call it *Kanonga*, and it is found described under that name in the works of Rumphius, an eminent botanist of the seventeenth century, who says that the smell of the flowers is so powerful that it scents the air for miles around. The flowers are flosculent and drooping, and of a greenish-yellow colour. They were first distilled by a chemist at Manilla, and yielded an essence of an exquisite odour, somewhat partaking of the jasmin and lilac, but still having a flavour *sui generis*. This essence is now largely manufactured, and used by the leading perfumers either pure or in compounds. It is made principally at Manilla and Singapore. The former is the finest, and costs when pure about £2 per ounce.—E. RIMMEL.

[123.]—ARNICA CERATE.—The British Homœopathic Pharmacopœia gives the following:—

Spermaceti, 3 oz.
White Wax, 6 oz.
Olive Oil, 14 fl. oz.

Add 1 drachm of medicated tincture to every 9 drachms of cerate and stir briskly until cold.—T. W. ROMANS, *Wakefield, January 14th*, 1871.

[125.]—SCIENTIFIC LIBRARY. — "*Stranger*" will have his wants supplied by the Educational Reading-room of the South Kensington Museum; open on Monday, Tuesday and Saturday from 10 a.m. till 10 p.m.—DELTA.

[128.]—AMANDINE.

℞. Ol. Amygdal. Dulc. Hiij
Syrup. Simplicis ℥ij
Sapon. Mollis Alb. ℥ss
Ol. Lavand. Ang.,
„ Bergam. Opt., ana ℥ss
„ Caryoph. ʒij

Rub the syrup and soap together in a perfectly clean mortar until the mixture is homogeneous. Mix the perfume with the oil and add *very gradually, stirring briskly until* thoroughly incorporated.

The following recipe will be found easier to make and much more efficacious for the purpose intended:—

℞. Mel. Ang. Opt. ℥iv
Ovi Vitell. No. ij
Pulv. Iridis ℥iss
Ol. Amygdal. Dulc. ℥iv
Otto Rosæ gtt. xij.

Mix the first three ingredients until they are a perfectly smooth paste, and add the oil (first mixed with the otto) slowly until the whole is combined.—H. A. WILLIAMSON.

[129.]—TALCA GUM is a variety of acacia gum. It consists of the siftings left from the finer sorts.—J. C.

[130.]—GERMAN YEAST.—Place ordinary beer yeast in a close canvas bag, and gently and gradually squeeze out the moisture in a screw-press until the remaining matter acquires the consistence of clay or soft cheese. In this state it must be preserved in close vessels or wrapped in waxed cloths.—M. N.

[131.]—MOUTH WASH.

℞. Rad. Krameriæ,
Gum. Myrrh. Opt., ana ℥ij
Caryophylli Olei ʒj
Sp. Vini Rect. Oij

Macerate fourteen days and filter.—H. A. WILLIAMSON.

[133.]—CAMPHOR CAKE.

℞. Gum. Camphoræ ℥ss
Ceræ Albæ,
Cetacei, ana ℥j
Ol. Amygdal. Dulc. ℥iv.

Dissolve the camphor in the oil previously warmed. Melt the wax and spermaceti in a water-bath; stir the whole together until nearly cold and pour into moulds.

H. A. WILLIAMSON.

In answer to "*Rusticus*" we give the following formulæ from the *New York Druggists' Circular* for the present month:—

(1.) Take of Spermaceti,
White Wax (pure), each 2 oz.
Almond or Olive Oil, ½ pint.

Melt them together by a gentle heat and add—

Camphor, cut small, 1 oz.

Stir the mixture until it is dissolved and then pour it into slightly-warmed moulds, which may be ounce gallipots or egg-cups with smooth bottoms. Hemispherical cakes will thus be formed.

(2.) Take of Clarified Suet, 1 lb.
Spermaceti, 3 oz.
White Wax, 2 oz.
Camphor, 1 oz.

Stir the mixture until it is dissolved and pour it into moulds as in the preceding.

Whiteness is a recommendation to camphor balls, therefore the materials used should be as free from colour as possible. They may be perfumed according to fancy.

[137.]—HAIR DYE.—I should be glad to be informed of a good recipe for hair-dye, or if some one will say what is used instead of ammon. hydrosulph. as application No. 1. —H.

[138.]—SYR. FERRI ET CALCIS SUPERPHOSPH. —Will any of the readers of the Journal oblige me with the formula for syr. ferri et calcis superphosph.?—IODI.

[*** See Mr. Gale's paper on the "Syrup of Superphosphate of Iron," etc., PHARM. JOURN., 2nd ser. Vol. I. p. 497. —ED. PH. JOURN.]

[139.]—SP. AMMONIÆ AROMATICUS.—I have some sp. ammon., B. P., received in September from a wholesale house in town, two Winchesters of which were not touched until this week. On the sides of each are deposited some very pretty crystals about the size of oxalic acid, I suppose owing to the severe cold. I shall be glad to hear if any other of your readers have observed the same in their sp. amm. ar. B. P., and if it is reduced in strength below the Pharmacopœia standard.—IODI.

[*** The crystals were probably carbonate of ammonia, and would redissolve on shaking and rise of temperature.— ED. PH. JOURN.]

[140.]—CHLORAL HYDRATE LOZENGES.—"*A Bookworm*" would be glad to receive a formula for making chloral hydrate lozenges.

[141.]—SP. CHLORAL HYDRATE.—"*A Bookworm*" also asks for a formula for sp. chloral hydrate.

Correspondence.

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

Proposed Regulations for Storing of Poisons.

Sir,—The all-absorbing topic with chemists appears to be the storing of poisons, and many of your correspondents write with some warmth upon the subject, feeling that their arrangements are being unnecessarily interfered with. Looking at the subject from all sides, I think the difficulty might soon be got over. No doubt those that are in a smaller way of business have comparatively as much convenience for storing as those who keep laudanum, arsenic, etc., in large quantities. The subject will be again brought forward, and thoroughly discussed at the General Meeting. It is very natural that a superior body of men should look with a deal of jealousy at being forced into anything; but it must not be forgotten that the Pharmaceutical Council are under an obligation to the Privy Council, consequent on the passing of the recent Pharmacy Act, to make some arrangements for the safe keeping and storing of poisons. Not that they think our body careless, but that the general public should know, as a rule, every precaution is taken to prevent accidental poisoning or otherwise. The Council have the matter left to them in a measure, and have invited opinions and discussion from the whole body of chemists, and have postponed the subject for a considerable time. I think it would be a great pity if, when the Privy Council call upon the Pharmaceutical Council for their plan, they had to say that the chemists, as a body, could agree to no plan. It then might be taken from their hands to those that did not know our requirements so well, and some regulations adopted which we might find rather troublesome of application. I think I may say, during my short experience, I recognize our body merging into a more homogeneous mass, and our opinions and feelings getting more in unison, and that our trade prices and seemingly troublesome poison regulations will disappear by being thoroughly discussed and ventilated.

W. Donaldson Boon.

King's Lynn, January 16th, 1871.

Sir,—May I be permitted to supplement the various suggestions for distinguishing poisonous articles by adding another? viz., that such things should be put into bottles rendered opaque, and that the labels should be hidden from view by a covering which must be lifted to enable the seeker to find the article; thus he would be compelled to read the label before using the substance, and a mistake would, under such circumstances, be highly blameable. All drawers, casks, boxes and parcels may be easily included in this system.

January 14th, 1871. Rus.

Sir,—In speaking of the above, I think some little regard ought to be paid to the feelings of others. In *M. P. S.'s* letter in your Journal of the 14th he is (I should hope) unthinkingly stirring up old grievances, which must indeed be most painful, both to Messrs. Oldham and the unfortunate "assistant" (in Mr. Guinness's case). Surely they have both suffered enough from their own feelings, without being again reminded of their misfortune through the medium of the only paper that has a circulation amongst nearly all the chemists in Great Britain and many abroad. Remarks might, I think, have been made just as striking without speaking of past and nearly forgotten misfortunes.

I am in no way connected with "Messrs. Oldham" or the "assistant," but have a little feeling for them. *M. P. S.* also remarks that "apprentices" and "porters" are, as a rule, uneducated. Now I think most of your readers will agree with me that the former are, as a rule, well educated, and the latter are, in many instances, better up in chemistry than many of those who are in a better position in the trade (this I know from experience), therefore they are competent to handle poisons. Fair Play.

Brighton, January 17th, 1870.

Pharmaceutical Ethics.

Sir,—I have read with much satisfaction your leading article of last Saturday on "Dispensing Charges and Alliances," and with your permission I will briefly express my views on the two matters therein discussed.

1st. *Dispensing Charges.*—That the average charge for dispensing is too low, I confidently assert, when we consider the pre-requisite education of a qualified dispenser, to which must be added the care, responsibility and the inevitable anxiety involved in our calling.

Further, there has, under the strain of competition, been a growing tendency during the last few years to reduce still lower these charges.

Unhappily, there are men amongst us possessing not an atom of that *esprit de corps* so essential to maintain and advance the respectability of pharmacy; willing to transact business on any terms, and sell at any prices, so long as the barest modicum of profits has been secured. The right course for wiser and better men to adopt towards such is simply to ignore them, but, unfortunately, the necessary courage so to do does not always exist,—the result is a depreciation of prices all round.

The plan I would advise my brother pharmaceutists to pursue is simply to fix their own scale of charges at what they deem an honourable range, and steadily hold thereto, through evil and through good report.

I am convinced that any attempt to bind by any local restrictive regulations the black sheep amongst us would be utterly useless. I would, however, suggest the possibility of a modified course of action being feasible, namely, that the pharmaceutists of any city or town anxious to advance the status of their business might most advantageously meet now and then for conference on trade questions, and thus agree to adopt, as far as practicable, a uniform standard of prices.

Even here some degree of latitude must be accorded to the varying circumstances of different localities. An East End chemist may be actuated by as pure and laudable principles as his West End brother, and yet find Belgravian prices will not acclimatize amongst his supporters; the parallel holds true in many a large provincial town.

The true solution of this difficulty is the one indicated in your article,—a *higher* but *elastic* scale of charges.

2nd. *Alliances.*—Whilst the former question affects two parties—the general public and ourselves, this affects also the medical profession.

These alliances may be broadly divided into two classes; the one demands and deserves unmitigated condemnation; I refer to the arrangement between a medical man and a particular chemist, by which, for a consideration, the prescriptions of the former invariably find their way to the establishment of the latter.

With regard to dispensing for medical men, the course of action is not so clearly defined, although I heartily accept the gist of your remarks.

Nothing can be more heart-breaking than the scale of remuneration (?) for dispensing between some chemists and their professional patrons, and where this work has been done by a competently trained and adequately paid staff, that it is unremunerative labour there can be no doubt.

Why, Sir, I have known a man as worthy and assiduous in his business as any man I ever knew, giving a surgeon credit for a four years' dispensing at a scale of charges that completely reversed the conditions of obligation, and yet such were the circumstances of the case, whilst wanting the money he was afraid to ask for it.

A clearer mutual recognition of the ground respectively occupied by the profession and pharmaceutists would lead to a better understanding of each other. The former should be paid for professional service only, the latter for physic.

If medical men really desire to see pharmacy advance its status without encroaching on professional ground, such a line of action would greatly facilitate it.

Hoping this expression of opinion may tend to elicit fuller discussion of such vital questions.

Salisbury, Jan. 11th, 1871. S. R. Atkins.

Sir,—I have read with considerable interest the article in last week's Journal on "Dispensing Charges and Alliances," and quite agree with you that perfect uniformity of prices for dispensing is neither practicable nor desirable.

On the second point referred to, viz. "Alliances," I will, with your permission, offer a few remarks; and, as I have done a considerable amount of contract dispensing, perhaps I cannot do better than give a little of my own experience.

Some years ago, I entered into an engagement with a medical firm to do their dispensing, which still continues, and I am not aware that I am taking any undue advantage of my brethren; I am on friendly terms with all of them that are likely to be affected by it. I have reason to believe that if I were to discontinue the contract, two or three of my immediate neighbours would be willing to take it. But supposing none of us would have it, would the dispensing fall to us in the regular way of prescriptions? No; the firm would at once do as they did formerly, employ a dispenser in their own surgery,—although they assure me they would only be too glad to give up dispensing altogether. But the custom of the town would not admit of it. They believe, and so do I, that my supplying the medicines instead of them is a step in the right, and not in the wrong, direction. It familiarizes the public with the practice, and induces the belief that the chemist, and not the medical man, is the proper person to apply to for medicines. I find that through such arrangements we often get opportunity of dispensing on our own account, which would not fall to us if the prescribers sent the medicines from their own surgeries. For instance, the patients will frequently say, "So-and-so is not my chemist; can't I get my medicines elsewhere?" and the reply is, "Certainly you can," and a prescription is at once given, which, of course, the patients have to pay for in the regular way. Altogether, from one cause or other, I feel sure that a very large number of prescriptions are given to the patients to get prepared where they may think proper, that would not be given them at all if the medicines were sent out by the doctors themselves.

I have recently had an interview with a chemist in a neighbouring town,—a gentleman who occupies a high position in the Pharmaceutical Society,—in reference to contract dispensing. I have given him a full account of the whole matter as far as concerns myself; and he is of opinion that such alliances are desirable in the interests of pharmacy, as at present constituted in this country.

Of course, we all know that it would be better to have the supply of medicines entirely in our own hands; at the same time, we are equally certain that at present we cannot have it so. E. F.

Spiritus Chloralis.

Sir,—In a paper read before the Liverpool Chemists' Association by Mr. A. H. Mason, and reported in your last number, occurs the following passage, which may lead to erroneous conclusions:—

"Spiritus chloralis is made by Savory and Moore. It has a very agreeable taste and smell, but I was not able to obtain any deposit upon evaporating a little."

A deduction likely to be drawn from this would be that the spiritus chloralis does not contain the pure German hydrate, which it does in the proportion of ten grains in the fluid drachm.

We know chloral hydrate easily crystallizes from some simple menstruums, such as spirit or water, but our preparation, as we state on the label, is a compound spirit, and the presence of volatile oils, glycerine, etc., in it prevents the crystallization of the chloral.

If the alkaline tests are applied to the spiritus chloralis, the chloroform will be seen forming and settling in a layer at the bottom, and if the alcohol present be estimated for what is dissolved again, or the alcohol carefully driven off *at a very low temperature*, the chloral may be estimated as chloroform.

Savory and Moore.

143, *New Bond Street, Jan. 7th*, 1871.

[***. We can only suppose the deduction feared by our correspondents to be possible in the case of persons ignorant of the fact that chloral hydrate is volatile below the boiling-point of water. We may state, however, that the sample of their spiritus chloralis sent here evidently contained a considerable amount of chloral, and on treatment with alkalies it yielded a quantity of chloroform corresponding with the specified strength of the preparation.—Ed. Ph. Journ.]

The Payment of Assistants.

Sir,—I have watched with deep interest the controversies carried on by our different pharmaceutical brethren upon the questions of obscure prescriptions, druggists' charges, the storing and keeping of poisons, and a multitude of other items, but there is one which has failed to attract attention. I am sure I speak the minds of my fellow-assistants when I say that our average salaries are less than those of any other class of assistants, without taking into consideration our extra outlay for study, books, etc. According to the present requirements of our Society, it would be vain for any one who wished to revel in the mysteries of our profession to make the attempt unless he could command at least £100 for premium, and he must also allot a similar sum for books, studies, clothes, etc. When he has terminated this monotonous stage of his life, and passed his examination, he rests with the comfortable assurance that his title will now secure to him a fair remuneration; but he finds that, while Pharmaceutical Chemists would undoubtedly prefer his services, they cannot see their way clear to give more than £40 and a free kit, as there are unqualified assistants that suit them equally well. He then sees his folly in wasting money which in many instances would give him a fair start in life. In support of my argument, and by way of conclusion, I may mention that I had occasion to visit one of our wealthy midland towns some twelve months ago. During my conversation with a friend of mine, it transpired that a Mr. I. required an assistant. Being at the time disengaged, I ventured to call upon him; and, after several questions having passed between us, as is customary, he asked me what salary I should require. I told him that my last stipend was £30, and that I did not care to engage under that sum (being then twenty-four years of age). He seemed completely bewildered, and, after duly staring me in the face, exclaimed, "What, £30! Then you must have had some considerable experience." As I did not care to engage for much less, and as these terms did not seem at all compatible, I retraced my steps, quite shocked, I can assure you. I omitted to mention that the gentleman in question was a member by examination, as set forth by divers diplomas exhibited in the windows.

January 7th, 1871. Fuissem.

A Suggestion.

Sir,—I shall feel obliged by your kindly allowing me, through the medium of your Journal, to suggest that wholesale druggists should not supply citrate of magnesia, glycerine, cochia pills, "et hoc genus omne," to any but those who are duly registered as chemists.

A brisk trade in these articles is carried on by hucksters in every village, to the injury of the legitimate chemist. They manage things better in France, where the *pharmacien* holds his proper position as determined by law.

D. Carroll, LL.B., Registered Chemist (Exam.).

Cerne Abbas.

R. G. (Slough).—We believe it is the custom in such cases to use the sp. chloroformi, B. P.

R. J. S.—We are unable to furnish you with the address applied for.

W. C. Tryon (Portsea).—The black colour is the result of a decomposition, of which an explanation will be found in any elementary work on chemistry.

S. Dean and *G. M.*—It may easily be obtained from any new or second-hand bookseller.

"*Xenophon*" has omitted to furnish his name.

W. G. (Wimborne).—Bentley's 'Manual of Botany' (Churchills) and Henfrey's 'Elementary Course of Botany' (Van Voorst).

*** In answer to several correspondents, we are able to announce that arrangements have been made for the issue of reading-cases, in sizes suited for holding three months' and six months' numbers of the Pharmaceutical Journal. Particulars will be announced next week.

Communications, Letters, etc., have been received from Mr. W. W. Stoddart (Bristol), Mr. W. D. Boon (Lynn), Mr. H. A. Williamson (Scarborough), Mr. P. L. Simmonds, "Soda-water," "Justitia," R. J. S. (Alfreton), M. S. P. (Swindon), G. M.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Continued from page* 483.)

PHANEROGAMIA.

Class I. Dicotyledones.—Subclass I. Thalamifloræ.

Nat. Ord. Ranunculaceæ.

Only two plants of this Order are named in the British Pharmacopœia, viz. Podophyllum and Aconitum, the latter being the only British plant, and therefore admissible in the present paper. In former times many more were made officinal, as Ranunculus, Delphinium, and Helleborus.

Aconitum Napellus (Linn.)

This beautiful but deadly plant, although originally an escape from the gardens, is in many places seen to grow thoroughly wild in the neighbourhood of Bristol. It may be gathered at Ashton, in the Leigh Woods, at Dundry, and at Shirehampton. Near the village of Stapleton is Frome Glen, a lonely and picturesque spot, where the river cuts its way through the new red sandstone and furnishes a luxuriant habitat for a long list of plants. The banks in many parts of the glen are completely hidden by Ferns and Mosses.

The rare *Asplenium lanceolatum* hangs from the rocky beds with its elegant fronds and scaly rachis. The *Lastrea dilatata* grows to a very large size, a giant among its sisters *Cystopteris*, *Polypodium*, *Aspidium*, *Athyrium* and *Ophioglossum*. In one part of the river the bank for twenty or thirty yards, and eight or ten feet high, is literally covered by tresses of *Fontinalis antipyretica*, a Moss with stems frequently two feet in length.

A small wood near this spot is a favorite resort of the author, and many delightful early mornings have been spent in it among the Anemone and Hyacinth, the stately Alder, and the pretty little Chrysosplenium. In their midst may be gathered the Aconite, growing luxuriantly, and often nearly a yard in height. Its dark green, deeply cut leaves show off the curious dark purple flowers. The petals are small and concealed within the calyx, which in this plant is the most conspicuous part of the flower. The upper sepal is much longer than the other, and shaped like a helmet, affording, as it were, a protection from the rain. This singularly-shaped sepal gives rise to its English name Monkshood, from a fancied resemblance to the hood of a monk's cowl. Indeed, the plant has had all kinds of epithets given to it, as helmet flower, wolf's bane, friar's cap, storm hat, and blue rocket.

Every part of the plant is probably poisonous to all animals, although Linnæus said that horses may eat the *dried* herb with impunity. In the B. P. the leaves are used for making extract, while the roots are used for the preparation of the tincture, liniment, and the fearful alkaloid aconitin.

Being a native of Italy and Greece, the virulent properties of the aconite were well known to the ancients. Theophrastus was the first to mention the word aconite (Hist. Plant. vol. ix. p. 16), but his description does not agree well with that of *Aconitum Napellus*, and it may therefore be a matter of doubt whether he alludes to the same plant.

Dioscorides and Ovid often mention aconite as a well-known poison. The latter in his description of the supposed Iron age, tells of its use in ridding a family of a troublesome relative.

"Lurida terribiles miscent aconita novercæ."

At the present day its administration is regarded with the greatest caution and infinitesimal dose.

The poisonous alkaloid aconitin is found in all parts of the plant, leaves, roots and seeds.

The roots are tapering and resemble those of many other vegetables; indeed, the specific name *Napellus* is derived from the similarity of the root to that of the wild turnip (Napus).

Aconitin ($C_{30}H_{47}NO_7$) exists in combination with aconitic acid ($C_6H_6O_6$). This acid is remarkable as being produced from citric acid when distilled at a high temperature; water, acetone and carbonic oxide are given off, and aconitic acid left.

$$\underset{\text{Citric acid.}}{C_6H_8O_7} - H_2O = \underset{\text{Aconitic acid.}}{C_6H_6O_6}$$

The B. P. process for the extraction of aconitin is similar to that of Dr. Headland or that of M. Stas. The alkaloid is first precipitated by an alkali, and afterwards dissolved out by ether. The student may easily prepare it for himself. To get a profitable result, it ought to be remembered that the smallest proportion of water must be employed before the addition of the ether, or the result will be materially affected, and lessened.

Mr. Morson also extracted another alkaloid from aconite, which he named napellin. The period when the roots contain the largest proportion of aconitin is when after flowering the leaves have just died off.

Analyses of the roots gathered at Frome Glen gave the following results, with the ether process:—

1 lb. av. of fresh root	before flowering	yielded	3·11 gr.
1 lb. av. ,,	after ,,	,,	7·97 ,,
1 lb. av. dried root bought in London		,,	31·98 ,,

The alkaloid thus produced when quite dry and powdered had a slightly brown colour, and possessed all the well-known qualities of aconitin mentioned in the B. P.

Nitric acid dissolved it without change of colour. Oxide of chromium was formed by the addition of sulphuric acid and bichromate of potassium. It was precipitated by tannic acid, terchloride of gold and iodine.

The difference between samples of aconitin is something inexplicable, except on the ground of adulteration. Delphinin and chalk have been mentioned as adulterating agents.

Aconitin is so deadly a poison, that Dr. Pereira was accustomed to say it could not be administered with safety, and that in one case an old lady was nearly killed by one-fiftieth of a grain. Dr. G. Bird mentions an instance in which a gentleman swallowed two grains and a half;—a sample of the extent to which adulteration has been carried.

Two well-authenticated cases of poisoning have occurred in Bristol. One at a convent, where an inmate had given to her, by mistake, forty minims of Fleming's tincture. Death ensued about four hours afterwards.

In the other case, a gentleman who had aconite-root used with roast beef instead of horse-radish. Mr. Herapath, who was the chemist employed in the investigation, calculated that one-twentieth of a grain of pure aconitin had been swallowed.

The proportion of aconitin in the leaves is very variable, so that the extractum aconiti must be also uncertain and not be depended on.

When making the extract, beautiful little octahedral crystals are often seen; these are aconitate of calcium.

Nat. Ord.. PAPAVERACEÆ.

The plants in this well-known Order are all herbaceous, and exude a milky juice having strong narcotic properties. One genus, *Chelidonium*, containing an alkaloid chelidonia, is not officinal, although Dr. Williams recommended its use, Its yellow juice is a popular remedy in the country for warts and corns. In the B. P. only two species of *Papaveraceæ* are named, both of which occur plentifully in the environs of Bristol.

Papaver somniferum (Linn.).

This plant is a native of Southern Europe and the shores of the Levant, but was probably introduced into England as a garden flower. Through the agency of birds and wind, the seeds have been scattered till, in a few places, the poppy may be considered as wild.

The only locality near Bristol, where *Papaver somniferum* can be said to grow in a wild state, is on the sandy shore of the Severn, near Westbury and Aust, upon the limestone beds of lias. The poppy likes a calcareous soil; the ashes of the seeds contain an unusual amount of lime, often nearly 35 per cent. Here, however, the plants do not attain a very large size, the capsules rarely exceeding the size of a walnut, the whole plant reaching the height of 12 or 14 inches. The flowers are handsome, usually white, with blue or purple veins. The leaves are glabrous and their peculiar bluish-green colour at once arrests the attention of the botanist.

The Poppy has been known as a narcotic from a very early period. Homer, who lived about nine hundred years before Christ, speaks of the poppy as a favourite garden plant, Il. viii. 306:—

> *Μήκων δ' ὣς ἑτέρωσε κάρη βάλεν, ἥ τ' ἐνὶ κήπῳ*
> *Καρπῷ βριθομένη.*

Virgil was evidently familiar with its appearance, when he says (Æn. ix. 436):—

> "Lassove papavera collo,
> Demisere caput, pluviâ cum forte gravantur."

Poppy juice (*μηκώνιον*) was the subject of a dispute between Diagoras and Hippocrates; the former condemning its use, while the latter extolled it.

The seeds of the poppy are used in Eastern countries by the confectioners and for sprinkling over cakes. They are very oily, and, when burnt, give off a disagreeable odour of fried bacon.

Horace in his 'Art of Poetry,' speaks of a distasteful flavour given to honey by the addition of poppies or more probably poppy-seeds:—

> "Sardo cum melle papaver offendunt."

The seeds contain 40 per cent. of a pale sweet oil. The cake remaining after pressure is highly nutritious as a cattle-food, containing 7 per cent. of nitrogen and 6·3 per cent. of phosphates of calcium and potassium. The black variety is sold under the name of maw seed, and used as a medicine for canaries. They are favourite objects for the binocular microscope, the surface being covered with hexagonal reticulations.

Poppy oil is often used for the adulteration of olive oil, and may be detected by the "beading" which appears when the oil is shaken, or still better by a solution of nitrate of mercury. The specific gravity of poppy oil is ·924, while that of olive oil is ·910.

The soluble matter or juice of the poppy is the most valuable agent. In China and Turkey it is considered indispensable. The Turk cannot do without his mash-allah, and the Tartar can subsist a long time without food, when taking a long journey, by making use of a few opium lozenges.

The B. P. orders the capsules to be gathered before being ripe. If M. Buchner's opinion be correct that the ripe capsules are the most narcotic, it would follow that the latter state would be the most desirable when making extr. papav.

The Bristol market is supplied from Westbury, in Wiltshire, where poppies are cultivated in large quantities.

The capsules of the wild plants from the Severn banks gave the dark red tint with $FeCl_3$, and an orange tint with NO_3, indicating meconic acid and morphia. They yielded an extract which produced 1·3 per cent. of morphia.

Mr. Groves says that in the ripe capsule there is a larger proportion of codein than in opium. The poppy capsule is a most instructive study for the student of structural botany. All true poppies have a *one-celled* ovary, although at first sight this statement may seem an erroneous one. On cutting a transverse section of one of the dried capsules, the placentation or attachment of the ovule is seen to be on the surface of the dissepiments (or vertical plates), and are, therefore, *parietal*, and not axial, as in the Foxglove or Orange. The dissepiments *do not reach the centre* of the capsule so as to make a multicellular ovary. Well may the poppy plant be prolific, for each capsule contains more than 32,000 seeds.

On the top of the capsule is the well-known cap or coronet, which is formed by the remains of sessile stigmas. Under this are small openings through which the seeds escape when the capsule reaches maturity.

The microscopic structure of the poppy capsule is very wonderful, and will amply repay any trouble taken in its examination. The knowledge is especially necessary for the detection of a very common adulteration of pulv. opii, where the quality is lowered by an admixture of the powdered capsules.

The outer surface (epicarp) is characterized by well-marked angular cells, with stomata, and strongly resembling a section of small fossil astreiform corals, and have broad, well-marked, cell-walls.

The inner surface (endocarp) is strangely different, although penetrated by the same stomata. The cells are very irregular and elongated; the thick walls have a beaded structure.

The dissepiments themselves have cells again completely different from either. They have the same size and general form as the endocarpal ones, but instead of the beaded configuration, they have carinated walls, with two series of pore-like dots, and, of course, devoid of stomata. Their appearance under a half-inch objective resembles, in an extraordinary degree, the little Fenestella, so frequently found fossil in the carboniferous limestone.

An excellent object for the low-power binocular is a transverse section of the dissepiment, showing the spermophore with the seed attached.

Very few of the articles of our materia medica can vie with the poppy and its products in profit and interest either to the chemist, botanist or microscopist.

Papaver Rhœas (Linn.).

This richly-coloured plant, the pest of our cornfields, is more especially abundant on the new red sandstone strata. It occurs more frequently in the South than the North of England. The capsules differ from those of *P. somniferum* in shape. They resemble the schoolboys' whip-top, with ten or more stigmatal rays in the coronet.

It is remarkable for its splendid red colour, which probably is the only useful property it possesses. The *P. Rhœas* is often confounded by the tyro with *P. dubium* and *P. Argemone*, but may be distinguished from the former by the shape of its capsule being globular and by the spreading bristles on the flower-stalk. From the latter it is instantly known by the smoothness of the capsule.

The colour of the petals of *P. Rhœas* is usually described as scarlet, but is in reality an exceedingly rich crimson. Treated by Riffard's process (*Journ. de Pharm.* vol. xii. p. 412), viz. by the action of ether and alcohol, the petals yielded a dark red colouring matter, which is deliquescent, insoluble in ether, but soluble in alcohol and water.

Acids partially destroy and chlorine quite decolorizes the red pigment. It is readily distinguished from the colouring matter of the rose and cabbage by becoming nearly black by alkalies, instead of the usual blue or green. The petals yield about 40 per cent. of Riffard's product.

According to Meier (*Repert. Pharm.* (3) vol. xli. p. 325) the red colouring matter of *P. Rhœas* consists of what he calls rhœadic and papaveric acids. The former differs from the latter by being precipitable by acetate of lead. Most likely, however, the true red colour has yet to be isolated.

In Bristol the syrup is much used as a popular remedy for measles, under the name of oil of kermes.

(*To be continued.*)

KAFUR KACHRI.

(*Hedychium spicatum*).

BY M. C. COOKE, M.A.

Many articles employed in Oriental medicine are still involved in great obscurity, so that it is impossible to state with any certainty whence they are originally derived, or what plants yield them. This seems to be pre-eminently the case with the products of Scitaminaceous plants. What can be more obscure than the sources of the different kinds of Zerumbet and Zedoary? and the Galangals are not satisfactorily determined, whilst Cardamoms were in a deplorable condition until Mr. D. Hanbury exerted himself to clear away some of the mystery which enshrouded them. Then there are other and minor products, undoubtedly belonging to the same Order of which we know exceedingly little, and doubt much. This is the case with the species of *Curcuma* which afford a starch of the nature of arrowroot. Who can identify, with any certainty, the sources of the *Curcuma* arrow-roots of India?

The *Kafur-kachri* of the bazaars of India is one of the substances which seem to be involved in the least obscurity; and though it is not of any great importance, a brief account of it may not be the less acceptable. The native names have been verified by Mr. Moodeen Sheriff, and may be relied upon. He gives Kafur-kachri, or Kapur-kachri, as the Hindustani name, the latter being also applied in Bengal and the Dukhan to the same substance. Vilayati-kachur is another Dukhani synonym; and the Tamil and Telugu names are respectively Shimai-kich-chilik-kizhangu, and Sima-kichchili-gaddalu, meaning "Europe or Foreign Long Zedoary."

On reference to the Indian Pharmacopœia, we find it stated that this is the Sitruttee of the bazaars, and was considered by Dr. Royle to be very probably the Sittarittee, or Lesser Galangal of Ainslie. The Supplement to the Pharmacopœia sets this question at rest, for it is declared that Sittarittie and Sutruttee, which are used in some works synonymously with Kafur-kachri as the Hindustani names of this root, are incorrect, because they belong as Tamil names to the Lesser Galangal, which is the product of a different plant. We may hereafter endeavour to clear up some of the doubts regarding the Galangals, so that it will be unnecessary to refer to them here.

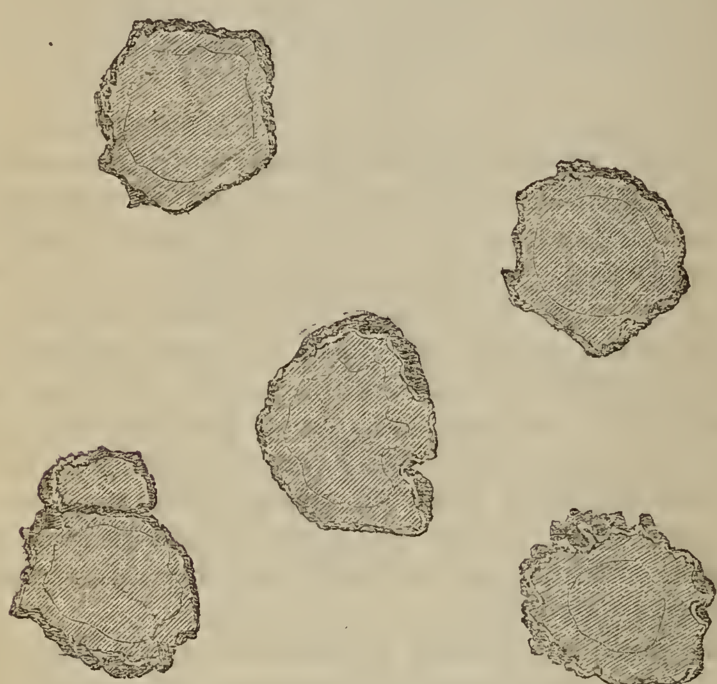
There is no reasonable ground for doubt that the Kafur-kachri is the root, or rhizome, of *Hedychium spicatum* (Smith), figured and described in the 'Botanical Magazine' (plate 2300), which is a native of the Himalayas.

The root when entire is reddish-brown, marked with white rings, bearing considerable resemblance to the true Sit-ruttee or Lesser Galangal, whence, perhaps, the confusion of names. It differs, however, from Galangal in being very white and friable, internally starchy in structure, fragrant, and slightly warm or aromatic in taste, but not peppery or pungent. In smell, taste and internal colour, as well as medicinal properties, it resembles the Long Zedoary; but neither in smell nor structure can the two be confounded after having been seen together. The peculiar, strong aromatic odour of the Kafur-kachri is, at any time, almost of itself sufficient to identify this drug; it is an odour never to be forgotten, and not to be confounded with any other. The starchy character of the substance of the root is so characteristic, that it cannot escape notice; the interior may be scraped away with a knife, or pounded into a white flour, as if it were nothing else but pure starch. Indeed, a little of this substance scraped with a penknife upon a slip of glass, in a drop of water, and submitted to the microscope, seems to consist as absolutely of starch granules as many prepared starches. The proportion of foreign matter is exceedingly small. The granules partake of the character of *Curcuma* arrow-root, except that they are

Starch of *Hedychium spicatum*.

somewhat smaller; that is, they are ovate or elliptical, rather regular in outline, but flattened, so that when seen sideways, they are lenticular, with rounded ends. At first a mounting of this starch seems to consist of two kinds of starch mixed together, but a few moments' examination soon proves that the narrow granules are only the broad ones set on edge.

The only form in which this drug is found in the bazaars is in circular slices, a line or a line and a half in thickness, and about the size of a "fourpenny piece," very white and friable internally, with a reddish-brown edge, and fragrant. Insects seem to



have a great partiality for it, especially weevils, as the bottles will soon testify, in which specimens are preserved, by the quantity of powder on the bottom.

The value of this drug as a remedial agent is probably very small. The great quantity of starch it contains would place it, perhaps, on an equality with other starchy rhizomes; but its properties as an aromatic stimulant would be surpassed by other common substances, and the merit it is supposed to possess as a tonic may be almost imaginary.

Dr. Stewart gives some additional uses for the plant in his recent work, and the range of growth which he found it to extend in the Himalayas. His observations are:—This plant is not uncommon in parts of the Punjab Himalayas up to near the Jhelam at least, at from 3500 to 7500 feet. Its large broad leaves are twisted and made into coarse mats for sleeping on, etc. The tuberous roots have, as "wild ginger," been tried by Europeans as a preserve, but without success. In Garhwal I was told they are used in washing the newly married; and Madden states that they are pounded with tobacco for the hookah. They are officinal under the above names, being considered tonic and stimulant. Honigberger is apparently in error in stating that they are only used in veterinary medicine. Cayley mentions that there is some import from the south of Lê, and export from the latter to Yarkand of *Kachur*, which is probably this, but may be *tekia kachur*, or *nar kuchar*, said to be the produce of *Curcuma Zerumbet*. Davies' trade report gives 25 maunds of *Kachur* as annually exported *viâ* Peshawur to Affghanistan.*

* Stewart's 'Punjab Plants,' pp. 239. Lahore, 1869.

CHINESE NATIVE OPIUM.

In confirmation of the remarks recently published in the Journal on the extensive production and consumption of native opium in China, the following details may be given. They are from a detailed report of an inland journey made by Mr. Moss at the expense of the Hongkong Chamber of Commerce, presented to the Chamber in November, 1870. The information is therefore recent, and may also be considered authentic. It is not likely to see the light in the official British consular reports for some time to come. Although all the foreign opium which is smoked in the country pierced by the West River is smuggled, and there is no means for estimating, even approximately, the quantity actually imported, it is impossible to arrive at any other conclusion than that in proportion to the consumption of the native drug it is trifling and unimportant. In the opium shops of Wuchaupu, and in all the towns to the westward, the foreign drug is rarely asked for, and that from Yunnan is exclusively smoked. What little foreign is used is Bengal, brought ball by ball up the river to Wuchau, and overland to the towns beyond from Yakpoi. Its price in the first week in July at the former city was 5 dollars per catty, or about 15 dollars per ball. At Tsunchaupu in June the price was dollars 5.10 per catty, and at Hwangchau a little over 5 dollars, or about 600 dollars per chest. The prepared drug was to be obtained at from 4 mace 8 candareens to 5 mace 5 candareens per tael weight, the average being about 5 mace per tael. Yunnan opium, on the other hand, was being retailed at from 3 mace 6 candareens to 4 mace per tael weight, according to its purity and quality. A common kind was purchasable at 3 mace. The raw drug is in round flat casks, about 6 inches in diameter by about 2 inches thick, weighing from 12 to 20 taels, and more or less adulterated with gritty, earthy matter. It was sold at from 18 to 20 taels per 100 taels weight; and old drug in the first week of July was selling at Wuchaupu at $12\frac{1}{2}$ taels. These rates were considered high. In the previous year the drug had been as low as 15 taels per 100 taels weight. From 15 to 20 taels per 100 taels weight is equivalent to 335 to 446 dollars per picul ($133\frac{1}{3}$ lb.).

Although it is smuggled into the country, and the very heavy exactions it is subjected to are evaded, the price of the Indian production, as compared with that of the native-grown commodity, is so high as practically to exclude it from consumption; and inquiry leads to the conclusion that, unless its price be reduced to approach closely to that of the latter, its superior quality, stronger flavour and greater narcotic power will fail to obtain for it an increased demand. It does not appear that foreign opium has ever been smoked in these regions by the bulk of the people; and if the statements of old smokers and of shopkeepers are to be credited,—and there seems to be no reason for discrediting them,—it cannot but be believed that for at least two generations native-grown opium only, from the province of Yunnan, has been almost solely consumed. There is nothing to show that its use has increased; on the contrary, it is obvious that the opposite must have been the case from the destruction of large cities, the diminution of the population generally over the country, consequent on the Taeping rebellion, and from the state of warfare which has existed during the past fifteen years and longer in the Yunnan Province, and which is reported to have devastated it. Considering the proximity of this portion of the empire to Canton, it is a significant fact that foreign opium has not entered into general use; and there can be no doubt that in the habituated taste of the native smokers the foreign drug has had to contend against an influence nearly, if not quite, as powerful as its own high cost.

The imputations which have been directed against the foreign trade in this article, in so far as it has affected this part of China, are disproved most convincingly by a journey up the West River. In no city, town or market village he enters will the traveller find the foreign opium consumed by the inhabitants; and in Kwangse, in only a few shops of the largest cities, will he succeed in meeting with it at all. The further he pushes inquiry the more firmly will he entertain the conviction that opium-smoking has been a habit common over the country from a period anterior to the present century, and that the supply has been met by native production. To impute its introduction into this portion of the country to the foreign opium trade is to assert what will appear to be positively contradicted by facts.

SYNTHESIS OF ALKALOIDS.

It has just been announced by Dr. Hugo Schiff, of Florence, that he has succeeded in obtaining by synthesis a product which possesses the characteristic properties contained in the active principle of hemlock (*Conium maculatum*), in fact identical with the alkaloid conia. When alcoholic ammonia acts upon butyraldehyd, at a temperature not above 100° C., two bases are produced, one of which, dibutyraldine, is represented by the following formula:—

$$\underbrace{C_8H_{17}NO}_{\text{Dibutyraldine.}} = \underbrace{2\,C_4H_8O}_{\text{Butyraldehyd.}} + NH_3 - H_2O.$$

By the dry distillation of dibutyraldine, there is obtained, among other products, a final one, which is the alkaloid in question. The following is the reaction that takes place:—

$$\underbrace{C_8H_{17}NO}_{\text{Dibutyraldine.}} = H_2O + \underbrace{C_8H_{15}N.}_{\text{Conia.}}$$

—*Journal of Botany.*

PODOPHYLLIN.*

Podophyllin, or the podophylli resina—a new purgative introduced into the British Pharmacopœia—comes to us from the United States, where it has for many years been largely used, and is obtained, by the action of rectified spirit, from the dried rhizoma of the American may-apple, or mandrake (the *Podophyllum peltatum*). It has a well-established repute as a purgative, and, from the character of the motions produced by it, has been called "vegetable mercury." When the proper dose for a patient has been found, it acts very efficiently, but different constitutions require different doses; a grain dose is rarely required, in many cases a sixth of a grain acts gently and efficiently, while others may require a dose of half a grain, though in not a few such a quantity would act violently. Authorities are not in accord as to its action. By many it is considered to be a powerful cholagogue, largely increasing the quantity of bile poured into the intestines; but while some assert that it excites increased secretion of bile, others say that its action as a cholagogue is only due to its stimulating the gall bladder to contract and expel its contents into the bowels. And again, others deny that it increases either the secretion or the excretion of bile. Dr. Anstie, who experimented with it on dogs and rats, came to the conclusion that it has no special action on the liver; and the Committee of the British Medical Association appointed to investigate the action of podophyllin on the liver reported that doses varying from two to eight grains, when given to dogs, diminished the solid constituents of the bile, whether they produced purgation or not; and that doses which produced purgation lessened both the fluid and the solid constituents.* It is difficult, however, not to believe the strong evidence given in its favour as a useful and powerful cholagogue in man—in conditions of disorder or disease, at any rate. American physicians of scientific repute hold it in great esteem as a cholagogue and general eliminative. Dr. Gardner says,† "I know no other substance which so certainly produced bilious evacuations when the liver is full of bile," and specially speaks of its value in jaundice, in the torpid liver of those who have resided in tropical climates, in gout, and in the constipation which often besets patients in phthisis. Dr. Ramskill,‡ after an extensive employment of it, reports, "As a cholagogue, it stands pre-eminent and alone—far before mercury or any other drug that I ever administered. . . . In very small doses it will procure an abundant flow of bile, and often induce its discharge by vomiting, before, or even sometimes without any purging." Dr. Sydney Ringer§ recommends it in the obstinate constipation which often follows an attack of diarrhœa in hand-fed infants. He uses an alcoholic solution of the resin, containing one grain to the drachm of alcohol, and of this one or two drops are given. It may be considered as having acquired a well-established reputation. In America|| it has been found, in small repeated doses, of great value as a deobstruent in scrofula, rheumatism, syphilis and other chronic diseases; and in England Dr. Marston,** of the Royal Artillery, and Dr. R. S. Sisson, have employed it in secondary syphilis as a substitute for mercury, with marked success.

Its action as a purgative is rather uncertain, and is apt to be attended with griping, to prevent which it may be combined with small doses of henbane, belladonna, or cannabis indica; and its action is rendered more certain by giving compound colocynth or rhubarb pill, soap, or ipecacuanha with it.

THE GUAVA.

The guava is a tree which grows in tropical countries, and it is found principally in the West Indies. It is of the genus termed by botanists, *Psidium*, and is of two sorts, the *P. pomiferum* and *P. pyriferum*. The plant does not attain any considerable size, being generally about fifteen feet high, and it is of very delicate formation. The bark is quite thin, and of a light brown colour. It peels off in small portions when exposed to the sun; to prevent this, the trees are usually planted beneath others of a larger growth and hardier nature. The leaves are of an elliptic, lanceolate form. They are very distinctly marked by the fibres of which they are

* Abstracted from a series of papers on the "Progress of Therapeutics," published in the *Medical Times and Gazette*.

* *British Medical Journal*, vol. i. p. 419, 1869. *Practitioner*, June, 1869, p. 355.

† *Lancet*, vol. i. pp. 209 and 286, 1862.

‡ *Lancet, loc. cit.*

§ 'Handbook of Therapeutics,' 1869, p. 304.

|| Rankin's 'Abstract,' vol. xxxv. p. 248, 1862.

** *Lancet*, January, 1864.

composed; they are of a dark green colour, and measure about 2½ inches. The flowers resemble those of the orange, and emit a strong perfume; the fruit is about the size of a small lemon; it is almost of the same shape and colour. The interior consists of a red pulpy substance, containing an innumerable quantity of small seeds somewhat larger than those of the fig. The rind of the fruit is of the consistency of that of an apple. Of this fruit the West Indians make several kinds of preserves,—the guava jelly, stewed guava, quake pear, and marmalade; the most lucrative is the guava jelly; the fruit is often eaten in its raw condition. The negroes are so fond of it that they are very wary and diligent in guarding the trees from robbery when they are bearing fruit.

The guava jelly is obtained by boiling the guavas with sugar and spices; and, after expressing the juice through a cloth, it is left to cool. Of course it undergoes minor processes, which I omit, they being inappropriate to the object of this paper.

The jelly is frequently bottled, but oftener it is put into small cylindrical boxes made of laminated pine board. A great quantity of this comfit is manufactured in Cuba, where it is termed "Jalea de guayaba," which is exported to the United States and Europe. Notwithstanding that a good deal is made in the smaller islands, they import quite a quantity of the Cuban jelly.

After the juice has been expressed from the guava, there remain the skins and the pulp containing the seeds; the latter is stewed and bottled, and it constitutes the stewed guava. This is generally partaken of with milk.

The skins are converted into the delicacy termed "quake pear," by a process varying slightly from the foregoing.

The guava marmalade is not frequently made. It consists of the guava grated and prepared in a peculiar manner.

Of the before-mentioned preserves, the marmalade is preferred by most connoisseurs. The small seeds in the stewed guava are very objectionable, the more so if one is subject to toothache, as they get into the cavities of decayed teeth, causing a great deal of suffering.

The natives of the West Indies are great herbalists; they convert almost any plant into medicine of some kind or other, and they have discovered several medicinal properties in the guava-tree and its complementary portions; what they are, I cannot pretend to say.

There is no distinction made between the name of the tree and that of the fruit in English, both being guava; the French term the tree *goyavier*, and the fruit *goyave*. Their respective terms in the Creole patois are *gyanbaum* and *gyan*.—*Druggists' Circular and Chemical Gazette.*

CHEMICAL EXAMINATION OF CONDENSED MILK.*

The *British Medical Journal* reports the following result of an analysis of the contents of a tin of Newnham's Condensed Milk:—

Water	19·0
Caseine	10·0
Ash	2·0
Fat, Milk-Sugar, Cane-Sugar	69·0
	100·0

The water was determined by drying at 212° F. The caseine was determined directly, the result being verified by the employment of Wanklyn, Chapman and Smith's ammonia process. The ash was determined by ignition. There appeared to be about as much fat as caseine. From the analysis it follows that the degree of condensation of Newnham's Condensed Milk is between three and four; that is to say, one pound of the condensed milk contains the solid constituents of from three to four pounds of fresh milk.

* See *ante*, No. 5, p. 89.

ANALYSIS OF MILK.

In making examinations of milk for sanitary or commercial purposes, it is customary to use determinations of specific gravity as indices of the *strength* of milk. It is, however, recognized that owing to the circumstance of cream being lighter than water, whilst skimmed milk is heavier, the indication of strength afforded by a determination of specific gravity is not very precise. Obviously, if, in addition to the specific gravity, the percentage of cream were taken, a connection could be applied so as to rectify the indication of strength derived from specific gravity. In the course of an examination of milk undertaken for the *Milk Journal*, the observation was made that there is another source of inaccuracy hitherto quite unsuspected. Skimmed milk consists mainly of water, caseine milk, sugar and a small quantity of mineral salts. Now, the exact molecular condition of the caseine influences the specific gravity of milk. In other words, samples of milk of the same strength will vary in specific gravity according to the exact molecular condition of the caseine. Especially are these changes in condition brought out if milk be kept for a while. This is illustrated by the following examples.

We do not intend on this occasion to enter fully into the subject of milk analysis, but we may state that plans commonly adopted are of little worth. We have had to notice the untrustworthiness of specific gravity determinations of milk,—that is to say, the danger of judging of the strength of milk by its specific gravity. To be of any value at all, the specific gravity determination must be made whilst the sample of milk is very fresh. After milk has been kept for two or three days, even in a closed vessel, its specific gravity falls in a very remarkable manner. The following examples exhibit this in an extreme form. The specimens of milk had been kept in corked bottles for four days:—

	Sp. gr. at 60° F.	Percentage of Solids dry, at 212° F.	Percentage of Ash.
Sample *a*	1·0004	11·34	0·94
„ *b*	0·9960	10·48	0·75
„ *c*	1·0184	8·92	0·66

Showing that the highest specific gravity sometimes accompanies the lowest percentage of solids. The reason of this want of correspondence between specific gravity and solid contents we have already explained. Meanwhile, in judging of the strength of milk, it is proposed to adhere to the method of evaporating to dryness in the water-bath, and weighing the residue.—*Milk Journal.*

THE HEAT DEVELOPED IN THE COMBINATION OF ACIDS AND BASES.*

BY THOMAS ANDREWS, M.D., F.R.S., HON. F.R.S.E.,
Vice-President of Queen's College, Belfast.

In a paper communicated to the Royal Irish Academy in 1841, I gave an account of a large number of experiments on the heat disengaged when acids and bases, taken in the state of dilute solution, enter into combination, and when bases, insoluble in water, are dissolved in dilute acids. The following general conclusions or laws were deduced from those experiments:—

Law 1.—The heat developed in the union of acids and bases is determined by the base and not by the acid, the same base producing, when combined with an equivalent of different acids, nearly the same quantity of heat; but different bases, different quantities.

* From the 'Transactions of the Royal Society of Edinburgh,' Session 1869–70.

Law 2.—When a neutral is converted into an acid salt, by combining with one or more atoms of acid, no change of temperature occurs.

Law 3.—When a neutral is converted into a basic salt, by combining with an additional proportion of base, the combination is accompanied with evolution of heat.*

Three years later I laid before the Royal Society of London the results of an experimental investigation of the heat developed when one base is substituted for another in chemical compounds. The law deduced from this inquiry is implicitly involved in the foregoing, of which it may indeed be regarded as a necessary consequence. It was enunciated in the following terms:—

Law 4.—When one base displaces another from any of its neutral combinations, the heat evolved or abstracted is always the same, whatever the acid element may be, provided the bases are the same.†

Finally, the law of metallic substitutions, first announced in the 'Philosophical Magazine' for August, 1844, was thus stated in a paper published in the 'Philosophical Transactions' for 1848.

Law 5.—When an equivalent of one and the same metal replaces another in a solution of any of its salts of the same order, the heat developed is always the same; but a change in either of the metals produces a different development of heat.

In 1845 a paper appeared by Graham on the heat disengaged in combinations, the second part of which refers to the heat produced when hydrate of potash is neutralized by different acids.‡ The results arrived at by this distinguished chemist exhibit a close agreement with those contained in my first communication to the Royal Irish Academy.

The concluding part of the elaborate memoir of MM. Favre and Silbermann on the heat disengaged in chemical actions is chiefly devoted to the same subject. A large number of experiments are described, which are nearly a repetition of those I had previously published. Their results bear a general resemblance to those given by myself in 1841, but they widely differ in the details. The authors of this able memoir fully recognize the accuracy of my fourth law, which asserts the equality of thermal effect when one base is substituted for another. "M. Andrews," they observe, "avait en effet établi que, quel que soit l'acide d'un sel, la quantité de chaleur dégagée par la substitution d'une base à une autre pour former un nouveau sel est la même, lorsque l'on considère les deux mêmes bases."§

In a preceding paragraph of the same memoir, the authors object to what they conceive to be my first law, and state that it is not in accordance with the results of their investigations. As the question is one of some importance, I may perhaps be permitted to quote the passage in the original language. "Ses conclusions, savoir: que la chaleur dégagée par l'équivalent d'une même base combinée aux divers acides est la même, ne s'accordent pas avec les résultats de nos recherches, et ne nous paraissent pas pouvoir être admises." No doubt, through inadvertence, MM. Favre and Silbermann have here given an inaccurate statement of my first law. It did not declare that precisely the same amount of heat is disengaged by all the acids in combining with the same base, but that the heat is determined by the base, "the same base producing, when combined with an equivalent of different acids, *nearly* the same quantity of heat." A comparison of the results of MM. Favre and Silbermann with those in my original memoir will show that I had fully recognized and described the deviations from the other acids, exhibited, on the one hand, in excess, by sulphuric acid, and on the other, in deficiency, by tartaric, citric and succinic acids. "If we refer," I remarked, in the original memoir of 1841, "to the first, second and fourth tables, as being the most extensive, from the large number of soluble compounds formed by potash, soda and ammonia, it will be observed that sulphuric acid developes from 0·8° to nearly 1° more than the mean heat given by the other acids; while tartaric, citric and succinic acids fall from 0·4° to 0·55° short of the same. A minute investigation of the influence of the disturbing sources of heat will no doubt discover the causes of these discrepancies. The high numbers for sulphuric acid are probably connected with that acid's well-known property of developing much heat when combining with successive atoms of water. All the other acids develope nearly the same amount of heat in combining with the same base, the greatest divergences from the mean quantity being, in the case of potash, + 0·24° and − 0·13°; in that of soda, + 0·26° and − 0·14°; and in that of ammonia, + 0·17° and − 0·05°. These differences are almost within the limits of the errors of experiment."*

But although there is a superficial agreement between my original results and those of MM. Favre and Silbermann, they will be found, when examined closely, to differ widely in detail and on points of great importance. I had found that oxalic acid disengages almost exactly the same amount of heat in combining with the soluble bases as hydrochloric, nitric and many other mineral acids, and this observation I have always regarded as one of the main foundations of Law 1. MM. Favre and Silbermann, on the contrary, have inferred from their experiments that "the following organic acids—oxalic, formic, valeric and citric—disengage sensibly the same quantity of heat, but it is less (*plus faible*) than that given by the foregoing mineral acids"—among which they enumerate the nitric and hydrochloric. According to my experiments, no distinction of this kind can be admitted between acids derived from the mineral and organic kingdom, inasmuch as oxalic acid developes at least as much heat in combining with the bases as hydrochloric, nitric and several other strong mineral acids.

The experiments to be described in this paper were made some years ago, but their publication has been deferred from accidental circumstances. I have, however, recently repeated a few of the more important of them, with a slightly modified form of apparatus. The solutions were taken in so dilute a state that the heat disengaged never exceeded 3·5° C. A standard solution of sulphuric acid was prepared and carefully analysed, by precipitating a given weight with a soluble salt of barium, and weighing the sulphate of barium. The strength of the alkaline solutions was adjusted with great care by means of this standard acid. The same solution of each alkali was employed in all the experiments, and the quantity used in each experiment was determined by careful weighing. The acid solution was of such a strength that, after being mixed with the alkali, an excess of two or three per cent. of acid was present. The alkaline solution was contained in a light glass vessel, in which a large platinum crucible holding the acid was carefully floated. By giving a rapid rotation, by means of a light stirrer, to the acid solution in the platinum crucible, a perfect equilibrium of temperature was soon established between the two liquids. The initial temperature of the solutions was usually about 1·5° below that of the air, and the final temperature of the mixture about 1·5° above it. The corrections for the heating and cooling action of the surrounding medium were determined with great care. The mechanical process of adding the acid to the alkaline solution produced no change of temperature, and as the heat disengaged in the combination raised the liquid almost instantly to the

* 'Transactions of the Royal Irish Academy,' vol. xix. p. 228.

† 'Philosophical Transactions' for 1844, p. 21.

‡ 'Memoirs of the Chemical Society,' vol. ii. p. 51.

§ 'Annales de Chimie et de Physique,' 3me série, xxxvii. p. 497 (1853).

* 'Transactions of the Royal Irish Academy,' vol. xix. p. 240.

maximum temperature, the whole correction required was for cooling. The first temperature was read one minute after the addition of the acid to the alkaline solution, the mixture being stirred during the whole of that time. If δ represents the correction, and ϵ the excess of temperature above the air in Centigrade degrees, the value of δ will be given by the following expression:—

$$\delta = \epsilon \times 0{\cdot}012^\circ.$$

As a proof of the accuracy of the method of mixture adopted in this inquiry, I may mention that, being desirous to know whether the dilute acids employed in these experiments produced any change of temperature when mixed with water, I made the experiment with nitric acid by the method just described, substituting water for the alkaline solution, with the unexpected result of a fall of 0·01°. On varying the conditions of the observation, so as to obtain a larger effect, it was ascertained not only that a diminution of temperature had actually occurred, but that the observed fall represented approximately its true amount. When hydrochloric acid of equivalent strength was diluted to the same extent, an elevation of temperature of 0·05° was produced.

The accuracy of experiments of this kind, where the whole thermal effect observed amounts only to 2° or 3°, depends greatly on the thermometer employed. Unless its indications are perfectly trustworthy in every part of the scale, the labour of the inquirer will only end in disappointment. I have therefore taken every precaution to secure this important object. The tube of the thermometer was calibrated and divided with care, according to an arbitrary scale, by means of a dividing instrument contrived for the purpose, and provided with a short screw of great accuracy made by Troughton and Simms. The divisions, etched finely on the glass, correspond to about 0·05° C., and the readings could be made with certainty to less than 0·01°. The division of the scale, corresponding to 0°, was determined from time to time in the usual way; and another point, about 30° C., was fixed by comparison with four other thermometers similarly constructed, whose scales extended from the freezing to the boiling-point of water. The readings of these four instruments, when reduced to degrees, rarely differed from each other within the limits to which they could be read, or 0·02°. The reservoir of the thermometer used in these experiments was 75 millimetres long, and, when immersed in the liquid, occupied nearly its entire depth.

As some uncertainty always exists with regard to the thermal equivalent of glass vessels, I made two sets of comparative experiments—one with a thickly-varnished copper vessel, and the other with a vessel of platinum. The mean result of these experiments coincided almost exactly with the result obtained when the glass vessel was employed.

The weight of the glass vessel which contained the alkaline solution was 58 grammes, and corresponded thermally to 11·4 grammes of the solutions formed. The thermal equivalent of the reservoir of the thermometer and of the stirrer was 0·9 gramme. The alkaline solution weighed 160 grammes, and contained the equivalent of 1·738 gramme of SO_3. The acid solution weighed 42·5 grammes. Hence the entire thermal value of the apparatus, in terms of the solution formed was:—

Solution	202·5
Glass vessel	11·4
Thermometer and stirrer . .	0·9
	214·8 grammes.

A correction (additive) of $\frac{1}{240}$ was made to the direct readings for the mercury in the stem of the thermometer. The results are given to thousandths of a degree, but this apparent minuteness is due to the reduction of the indications of the arbitrary scale to degrees.

The following table gives the mean results of the new experiments, the acids being arranged in the order of their thermal action:—

Acid.	Potash.	Soda.	Ammonia.
Sulphuric acid . . .	3·378°	3·353°	2·976°
Oxalic acid	3·058°	3·040°	2·648°
Hydrochloric acid . .	3·021°	2·982°	2·623°
Nitric acid	2·993°	2·929°	2·566°
Acetic acid	2·852°	2·832°	2·492°
Tartaric acid . . .	2·732°	2·710°	2·376°

It is interesting to observe how closely the results in the three vertical columns agree relatively with one another. The acids follow in the same order under each base, and even the differences in the amount of heat disengaged by the several acids in combining with the different bases approximate in many cases closely to one another. Thus the heat given out when sulphuric acid combines with potash exceeds that given out when oxalic acid combines with the same base by 0·320°, the corresponding differences in the case of soda and ammonia being 0·313° and 0·328°. If, in like manner, we compare the differences between the heat disengaged by the acetic and tartaric acids, we fall upon the numbers 0·120°, 0·122°, and 0·116°. Even in the case of oxalic, hydrochloric and nitric acids, which disengage so nearly the same amount of heat, the same order is observed with the three bases. It must be particularly remarked that the oxalic acid disengages from 0·022° to 0·058° more heat in combining with these bases than the hydrochloric acid, and from 0·065° to 0·111° more than the nitric acid. The conclusion of MM. Favre and Silbermann, that the organic acids (oxalic, formic, acetic, etc.) disengage sensibly less heat than the mineral acids, is thus entirely disproved; and the original results recorded in my work of 1841, according to which oxalic acid disengages at least as much heat as nitric, phosphoric, arsenic, hydrochloric, hydriodic, boracic and other mineral acids (with the exception of the sulphuric acid) are fully confirmed. Tartaric, citric and succinic acids, it is true (as was also shown in the same work), give out about $\frac{1}{14}$th less heat than the average of the other acids, but acetic and formic acids fall scarcely $\frac{1}{30}$th below the mean, and oxalic acid is always above it. These results, in all their main features, are fully corroborated by the experiments recorded in this paper, which were performed with a more perfect apparatus and a more exact thermometer than I had at my command in my earlier investigations. A reference to the same paper will show that while acids, differing so widely from one another as oxalic, phosphoric, arsenic, nitric, hydrochloric and boracic acids scarcely present any sensible difference in the quantities of heat which they disengage in combining with the bases; and while of the other acids examined sulphuric acid (and probably also sulphurous acid) presents an extreme deviation of about $\frac{1}{8}$th above the mean, and the tartaric acid group a deviation of about $\frac{1}{30}$th below it, the bases, on the contrary (and the subsequent researches of Favre and Silbermann have confirmed this result), differ altogether in thermal power from one another. Thus, equivalents of the oxides of magnesium and of silver give out 4·1° and 1·8° of heat respectively in combining with nitric acid, the former oxide having therefore 2·3 times the thermal power of the latter. Yet, as is well known, both these bases fully saturate the acid, and the resulting solutions are even neutral to test-paper. For these reasons I have no doubt whatever that the first law, as enunciated in 1841, is the expression of a true physical law, and that in the combination of acids and bases in presence of water the heat disengaged is determined by the base and not by the acid. It is true that in this, as in similar physical inquiries, experimental results cannot immediately be obtained free from complication or disturbing influences. The same remark applies to the experimental proof of the great law discovered by Dulong and Petit, which connects the specific heats and atomic weights of the elementary bodies, and also to that of the remarkable relations discovered by Kopp between the composition and boiling-points of many organic liquids. We have already seen an illustration of one of these disturbing influences in the fact that dilute nitric acid, when mixed with water, gives a slight fall of temperature, hydrochloric acid a rise; and the differences of specific heat in the solutions formed will, to a small extent, modify the results. But the cause of the higher thermal power of sulphuric acid I have not been able to discover, and future researches must decide whether it depends upon some disturbing cause, or (which is less probable) upon its possessing an exceptionally high thermal power. One condition is, however, essential, or Law 1 will not apply. The acid and base must be capable of combining when brought into contact, and of forming a stable compound. In the paper so often referred to, I showed that hydrocyanic acid and potash, which fail to fulfil this condition, do not disengage the normal amount of heat when mixed; and the same observation will doubtless be found to apply to a large number of metallic oxides which form unstable compounds with, and imperfectly neutralizes the bases.

As regards the experimental proofs of the other laws, even those of the fourth law, the truth of which is admitted by MM. Favre and Silbermann, they are only approximative, and here also we meet occasionally with peculiar and unexpected results. Thus, a slight fall of temperature occurs, as Hess showed long ago, in the conversion of the neutral sulphate of potash into the acid salt; and I found, as, indeed, might have been expected from their alkaline reaction, that in the conversion of the ordinary phosphates and arseniates into supersalts a disengagement of heat occurs, amounting to about one-seventh of that disengaged in the formation of the salts themselves. In other cases results, at first view startling and apparently anomalous, will be found to be strictly in accordance with the general principles already laid down. In the formation of double salts there is no disengagement of heat, a principle announced in 1841, and which ought perhaps to be enunciated as a distinct law, although it is implicitly involved in Law 2. Again, if tribasic phosphoric acid or arsenic acid is added in fractional portions to a solution of potash till the subsalts are formed, the heat disengaged on each addition of acid corresponds to the amount of acid added; but after this point has been reached the disengagement of heat follows a different law. Pyrophosphoric acid, on the other hand, behaves in the same way as nitric and most other acids when added in successive portions to solutions of potash or soda, equal increments of heat being evolved for equal additions of acid till the pyrophosphate of potash or soda is formed.*

Appendix.

In the following tables I have given the results described in this communication and those of 1841 in a form which admits of comparison with one another, and with those of MM. Favre and Silbermann. I have also added a few determinations recently made by M. Thomsen, of Copenhagen.† It will be seen that the original experiments of 1841 exhibit, on the whole, a fair agreement with those now communicated to the Society. From the small scale on which they were performed (the whole weight of the solutions after mixture being less than 30 grammes), the imperfect form of the apparatus, and the uncertainty of the thermometric indications, I have indeed been surprised to find them so near the truth. The results of MM. Favre and Silbermann do not exhibit the precision which might have been expected from the high character of those experimentalists, and from the accuracy of other parts of their great work. The mercurial calorimeter employed by them appears to have been little adapted to its purpose; but after making due allowance for its imperfections, I am at a loss to account for the serious errors into which they have fallen. M. Thomsen's experiments have evidently been made with care, and his results agree comparatively with my own; but the absolute amount of heat obtained by him falls far short of what I have found. It is, indeed, much easier to obtain results relatively than absolutely correct. The numbers given in this paper will, I believe, be found rarely to differ *relatively* more than $\frac{1}{200}$th from the truth, but they may hereafter require a small correction in respect of their *absolute* value. That correction can, however, be scarcely more than $\frac{1}{50}$th of the whole amount, and I have little doubt that the number, for example, given by Thomsen to express the heat disengaged in the combination of soda with nitric acid will prove to be as far below the true number as that given by MM. Favre and Silbermann is above it.

Table I.—*Potash.*

Acid.	Andrews, 1841.	Favre and Silbermann.	Andrews, 1870.
Sulphuric . . .	16,330	16,083	16,701
Nitric	15,076	15,510	14,800
Hydrochloric . .	14,634	15,656	14,940
Oxalic	14,771	14,156	15,124
Acetic	14,257	13,973	13,805
Tartaric	13,612	13,425	13,508

Table II.—*Soda.*

Acid.	Andrews, 1841.	Favre and Silbermann.	Andrews, 1870.	Thomsen.
Sulphuric . .	16,483	15,810	16,580	15,689
Nitric . . .	14,288	15,283	14,480	13,617
Hydrochloric	14,926	15,128	14,744	13,740
Oxalic . . .	14,796	13,752	15,032	..
Acetic . . .	14,046	13,600	14,000	..
Tartaric . .	13,135	13,651	13,400	..

Table III.—*Ammonia.*

Acid.	Andrews, 1841.	Favre and Silbermann.	Andrews, 1870.
Sulphuric . . .	14,135	14,690	14,710
Nitric	12,440	13,676	12,683
Hydrochloric . .	12,440	13,536	12,964
Oxalic	12,684	..	13,088
Acetic	12,195	12,649	12,316
Tartaric	11,400	..	11,744

* 'Transactions of the Royal Irish Academy,' vol. xix. pp. 245–248. The observations of Graham confirm the statement that no heat is evolved in the formation of any double salt. 'Memoirs of the Chemical Society,' vol. i. p. 83.

† Poggendorff's 'Annalen,' cxxxviii. p. 78.

Preserved Meat.—There has lately been a trial of preserved meat from Rosario, in the Argentine Republic, with, it is stated, satisfactory results. Preservation was effected by immersion in bisulphite of lime, according to the process of Messrs. Medlock and Bailey, of Wolverhampton; and the meat was sealed up in a cask, in the presence of the British Consul at Rosario, on August 10th last, and brought by him to England in a recent steamer. It had, therefore, been kept four months, and had made a passage across the Line.—*Journal of the Society of Arts.*

Glycerine Inhalation in Croup.—Dr. Stehberger, of Mannheim, reports that he has successfully used inhalation of glycerine, through Siegle's apparatus, in the early stages of croup. The glycerine, if pure, is used unmixed; if not pure, it is diluted with a little water.—*British Medical Journal.*

THE CHEMISTS' BALL.

On Wednesday evening this social gathering, which now seems firmly established as an annual one, was held in Willis's Rooms, St. James's. The Ball was a complete success. There were upwards of four hundred persons present, and on no former occasion has the assembly been graced by the presence of so many ladies. Amongst the many guests there were the Lord Mayor and Miss Dakin; the Pharmaceutical Society was represented by the President and Vice-President; the Auditors of the Society by Mr. Barron; the Council by Mr. T. B. Groves and Mr. Bourdas; the Examiners by Mr. Allchin and Mr. M. Carteighe; the Educational Department by Professor Attfield and Mr. W. A. Tilden; and the other officials by the Secretary, Mr. R. Bremridge and Mr. Flux. The Supper, which was an elegant one, was served in three rooms, and the Committee must have been much gratified with the extremely pleasant manner in which everything connected with the Ball passed off.

In proposing the toast of the evening, the Lord Mayor said he was much gratified in having been asked to preside on this occasion, which he believed to be the fifth of the kind, and which was such an evident success. As the enjoyment of privileges always entailed duties, so the position which he then held involved the duty of observing the usual rule of this gathering, and proposing the one toast which was customary, viz. "Success to the Chemists' Ball." In doing so, he felt how much satisfaction was to be realized in the performance of duties, and he desired to take the opportunity of expressing his approval of such a gathering; for independent of the pleasure it afforded to all who took part in it, it was calculated to be eminently useful when regarded as an annual rallying-point of the members of our most important profession. He was glad also to learn that yet another object was served, and that the surplus proceeds of the Ball flowed "heaven-directed" to the poor. Though he was precluded by usage from adding to the one toast he now proposed, he could not, while surrounded by so much youth and beauty, abstain from making some reference to the presence of those without whom we should not be able to enjoy the pleasures of the evening, any more than we could dispense with their good offices in other matters. For this reason he would ask them to add three cheers to the toast of "Success to the Chemists' Ball."

After the cheering had subsided, Mr. Watson rose, and in a few words proposed that they should still further depart from the usual custom and show the appreciation of their presence there that evening by drinking to the health of the Lord Mayor and Miss Dakin.

After the toast had been honoured and the cheers given, the dancing was resumed and kept up with great spirit until a very late hour.

How to Fasten Rubber to Wood and Metal.—As rubber plates and rings are now-a-days almost exclusively used for making connections between steam and other pipes and apparatus, much annoyance is often experienced by the impossibility or imperfectness of an air-tight connection. This is obviated entirely by employing a cement which fastens alike well to the rubber and to the metal or wood. Such cement is prepared by a solution of shellac in ammonia. This is best made by soaking pulverized gum shellac in ten times its weight of strong ammonia, when a slimy mass is obtained, which, in three to four weeks, will become liquid without the use of hot water. This softens the rubber, and becomes, after volatilization of ammonia, hard and impermeable to gases and fluids.—*Druggists' Circular and Chemical Gazette.*

ANNUAL DINNER OF THE SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Annual Dinner, in connection with the above Association, was held at Mr. Armfield's, Adelphi Hotel, on Thursday evening, the company numbering between forty and fifty. The chair was occupied by the President, Mr. J. T. Dobb, and the vice-chair by the Ex-President, Mr. Wilson.

The usual loyal and patriotic toasts having been proposed and honoured, Dr. Hall gave the toast of the evening, "Success to the Sheffield Pharmaceutical and Chemical Association," and, in the course of his remarks, congratulated the Association upon its prosperous condition. He alluded in graceful terms to the relationship which existed between the medical and pharmaceutical professions, how dependent one was upon the other, and at some length reviewed the sections of the Annual Report, which had been distributed that evening.

Several other toasts were proposed and duly honoured, after which the Chairman, in proposing the "Continued Success of the Pharmaceutical Society of Great Britain," said, What is the sphere of labour of our Sheffield Pharmaceutical and Chemical Association in its connection with the parent Society? To my mind the efforts of your Association should be devoted to extending and establishing the Library and Museum, to maintain and uphold, as far as our funds permit, our Latin, botanical and chemical classes, with the regular course of lectures. In the future looms a laboratory for practical chemistry, with an established teacher. With the support and approval of the Pharmaceutical Society these forces might be so utilized and brought to bear upon the education of those in this neighbourhood who are studying for the profession, as to be a great advantage to them. Sheffield is in the midst of a large and populous district, and could be made the centre of a district. The examiners of our Local Association might give certificates of competency in the examinations, and thus save the expense and time occupied in journeys to London for such a purpose. I do hope the day is not far distant when these desires will be realized, and that the Pharmaceutical Society will give us all the moral and material support in their power.

Veratrum Viride an Antidote to Opium.—E. H. Sholl, M.D., of Alabama, communicates to the *Philadelphia Medical and Surgical Reporter* a case of poisoning by morphia, which was cured by veratrum. The patient, a negro boy, aged fifteen years, had typhoid fever, and took an overdose of morphia, which had been prescribed for hiccup. It was followed by stertorous breathing, contracted pupils, and so forth. His mouth was prized open, and gtt. xviij Norwood's tincture poured in, "with two ounces of brandy." In one hour every symptom of poisoning had vanished.

Quinquina Chocolate.—Dr. Heuze, in *Les Mondes* of June last, says, he has succeeded in preparing an extract of Peruvian bark, so as to possess no unpleasant bitter taste, and this is mixed with pure chocolate paste, so as to form readily-portable, and, at the same time, an agreeable, dietetic medicine. This preparation is (thus it was stated at a meeting of the Central Imperial Society of Agriculture) considered superior to the sulphate of quinine.

Chloride of Zinc in Rods.—Dr. Köbner, of Breslau, describes (*Berlin. Klin. Wochenschr.*, no. 47, 1870) a method of making solid rods of chloride of zinc. Two parts of the chloride are fused with one part of nitrate of potash and formed into rods, which are kept in tinfoil in a well-stoppered bottle. They will last for a week. The combination forms, says Dr. Köbner, an excellent caustic, holding a place midway between nitrate of silver and caustic potash.—*British Medical Journal.*

The Pharmaceutical Journal.

SATURDAY, JANUARY 28, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes endorsed "Pharm. Journ."*

PHARMACY IN IRELAND.

IT is probable that among the various matters claiming the attention of our legislators in the approaching Parliamentary Session, the Pharmacy Bill for Ireland, proposed by the Governor and Company of the Apothecaries' Hall, Dublin, will have a place. The Bill has been already printed in this Journal,* and doubtless has been read by many interested. It does not seem to have been regarded with much favour by the chemists and druggists of Ireland; but although an expression of opinion was invited, and a portion of our space offered for the discussion of the subject, only three letters have, up the present time, been received. Certainly it seems desirable that those whom the question most affects should not rest contented with merely protesting, but that before the time arrives for the discussion of the Bill in Parliament they should decide among themselves what course they ought to take.

That the state of affairs with regard to the practice of pharmacy in Ireland is anomalous has long been admitted. A chemist and druggist is allowed to vend drugs to any extent, but is absolutely prohibited, under fear of a heavy penalty, from making up a single prescription. That portion of the business is confined to members of the Apothecaries' Hall, who are also permitted to sell drugs.

The law, as it at present stands, simply creates a monopoly which cannot be defended on the ground that it favours the educated pharmacist, for a man, however well qualified to practise that calling, is not allowed to do so in Ireland unless he is a member of the particular body mentioned. He may have passed the examination of the Pharmaceutical Society of Great Britain and hold a diploma certifying that he is competent to dispense a prescription in England, Scotland, or Wales, but let him cross the St. George's Channel and set his foot in Ireland, and his diploma is of no avail. Surely that skill which is accounted sufficient in England would be equal to satisfying the requirements of the Irish public.

There is no reason why the law concerning pharmacy should not be assimilated in the three kingdoms. In doing this, it would be necessary to guard against the privilege of dispensing being accorded to any but those who are competent fully and conscientiously to carry out a prescriber's wishes. But this should be done with consideration. Men who have been many years in business, and who have a good practical knowledge of it, could hardly be expected to enter upon a curriculum of chemistry, botany and materia medica. Any examination that may be instituted should be capable of being modified to meet these and similar cases in Ireland; and persons who have once satisfied the requirements of the English law ought to be allowed to practise there without any further examination.

* No. 21, p. 405.

POISON REGULATIONS.

OUR readers will perceive that we have again some long communications on this subject, which deserve attention as representing various views. We have also during the last few weeks published some information as to the state of opinion and law in Canada and the State of New York respecting the sale of poisons. The present Journal contains a number of recent cases of poisoning, illustrating some of the modes in which accidents happen. Both these and the papers above referred to afford matter for reflection, though they cannot be expected to determine the regulation question. In regard to that, it appears there are some who maintain there should be regulations, some who maintain there should not be any, and others who declare they will not have them. Which of these three views is to rule the action of the Society is clearly a matter for decision by vote, and meanwhile we endeavour to fulfil our part by furnishing all available information on the subject.

An amusing instance of popular posology occurred this week in the report of a case of poisoning given by one of the London daily newspapers. It was there stated that death arose from an overdose of opium, "the deceased having taken a drachm and a half, whereas the full dose was only a drachm."

A CROWDED audience assembled in the theatre of the London Institution on the occasion of the Conversazione on Wednesday evening last, to hear Professor Tyndall lecture on "Dust and Disease." The discourse, which was a very eloquent one, was a repetition, with some variations, of his celebrated lecture on the same subject at the Royal Institution.

DISPENSING IN SURGERIES.

In calling the attention of our readers to the report, in another column, of a case of poisoning by an overdose of morphia, we wish to say that any remark that may be made will not be intended to apply to particular individuals. If the method of dispensing adopted in Mr. Dex Bean's surgery had been singular and unusual, probably we should have abstained from comment; but as, on the contrary, we believe it to be typical of what might be met with in hundreds of surgeries throughout the country, and these belonging to members of a body which, at times, is inclined to be rather exigent in its demands upon pharmacists, we are tempted to call attention to some of the facts of the case.

A child being ill, a medical gentleman who was called in, prescribed for it a mixture of solution of tartarized antimony, hydrate of chloral, and colouring matter. This mixture was supplied from his own surgery. A teaspoonful having been administered the child fell into a deep sleep, only disturbed by convulsions until its death. We do not think we shall be charged with unfairness if we say that here, in the ordinary course, there would have been an end of the affair. But it happened that the father, who is a chemist and druggist, recognized the appearance of narcotism in the child; and after its death he obtained an analysis of the portion of the mixture which remained, the result being that it was found that antimony which was ordered was absent, while morphia, which had not been ordered, was present.

As to the state of things which would allow of such a result. The prescription was left to be dispensed by a pupil who had been under tuition one year and three-quarters. Now we doubt whether there are many respectable pharmacies in which an apprentice in so early a stage would be entrusted with the responsible work of compounding prescriptions, certainly not without vigilant supervision. But what are the facts with regard to this young man? What is Mr. Dex Bean's own evidence on this point? "The drugs were left to be compounded by his assistant, John Simeon Dyson. No other person was authorized, or even able to compound the medicine. He had not interfered with the dispensing department for the last twelve months. He could not say where the bottle containing chloral was kept exactly. Mr. Dyson had had one and three-quarter years' practice in dispensing. He had dispensed, without supervision, sixteen months." Again, in answer to the question, "How many prescriptions has the young man Dyson made up?" the answer was, "Several thousands." And again, in answer to a question from the foreman of the jury as to the qualifications required in a dispenser, Mr. Dex Bean replied that dispensing was merely mechanical, and he did not think that previous education had much to do with it.

So that this young man, when he had only had five months' experience, was left to make up his employer's prescriptions without any supervision, since which time he has prepared several thousands! Such statements carry in them the strongest possible condemnation of a system under which it is possible for them to be made. The inference to be drawn from the occurrence by every candid mind, amongst medical men and pharmacists, must be, that it is their duty to do all in their power to hasten the time when dispensing as well as prescribing shall be performed only by men specially trained to each calling.

At the Evening Meeting of the Pharmaceutical Society on Wednesday next, a Lecture will be delivered by Dr. Carpenter, the subject being "The Microscope and its Revelations."

The *British Medical Journal*, referring to the paper by Mr. Ince in our last number, expresses an opinion that while the object is a good one, it is worth considering how far it accords with proper reticence and courtesy. It thinks that before putting such documents to a public use the permission of the writers should be asked, and if this were not possible, the signatures should be erased.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

January 17th, 1871.

Present—Messrs. Ainslie, Aitken, Baildon, Brown, Buchanan, Kemp, Mackay and Young.

Twenty-four Candidates were examined, eleven for the First or Preliminary Examination, eight for the Minor, and five for the Modified; the following passed and were duly registered:—

FIRST, or PRELIMINARY (as Apprentices or Students).

Anderson, David Smith ...... Musselburgh.
Bray, William .... Dumfries.
Chislett, Charles .... Edinburgh.
Galloway, George, jun. ...... Inverness.
Gardner, William .... Inverkeithing.
M'Leish, Stewart Munn ...... Uddingston.
Meldrum, David .... Edinburgh.
Moffat, Alexander Dryden .... Glasgow.
Russell, James Bryce .... Glasgow.
Sharp, Robert Henry .... Portobello.

MINOR (as Chemists and Druggists).

Galloway, George, jun. ...... Inverness.
Giles, William .... Aberdeen.
M'Naught, Archibald .... Greenock.
Macpherson, Richard .... Greenock.
Veitch, John Wilson .... Dunse.

MODIFIED (as Chemists and Druggists).

Ewing, James .... Edinburgh.
Robinson, Jonathan Scott .... Rhyl.
Savage, James .... Bradford.
Stephen, John .... Aberdeen.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

On Friday, the 13th instant, the Third Monthly Lecture of the Session was delivered at the Philosophical Institution, by Herr Leipner. The subject was "The Pharmacist in Germany."

The lecturer drew a hasty sketch of the history of pharmacy from its birth in the dim ages, burdened and half-smothered with the myths of alchemy, through the time of its childhood, bolstered and protected by the operations of guilds and municipalities, to the dawning of the present century, when the period of its maturity as a living, independent branch of science was reached.

The social position of the pharmacist during these times he showed to have been pretty much as might have been expected from the varying amount of credit with which the art was practised. The enthusiast, the quack and the tradesman, each in turn, claimed him for his own; but, in proportion as his art had struggled through the disadvantages that at different periods surrounded it, and he had become the qualified practitioner of a liberal calling, his own status in society had advanced.

In drawing his present position, and the circumstances that now surrounded him, the lecturer found it necessary to give an outline of the educational system of the Germans. It appeared that every child of Germany was by law compelled to be educated in one of three grades of school, either in the first or elementary school, the course of study in which embraced only the elementary subjects; or in the second, the "real" school, which, in addition to the above, included French, English, chemistry, physics, algebra, mathematics, Latin, drawing, and more history, natural history, geography and arithmetic than taught in the elementary schools; or in the third, the gymnasium, which gives a purely classical education. From the sixth to the tenth year all children attend an elementary school, after which they may enter either a real school or a gymnasium.

The class from which the pharmacist most usually sprang generally affected the "real" school; hence, in commencing his special studies, the young pharmacist started with an already acquired knowledge of the elements of natural science and chemistry. At this period of his career he entered a pharmaceutical college, where he devoted himself to the sciences especially required in his future duties for a period of two to three years, and from which he was required to emerge by the process of an examination creditably passed. He then, for a definite time, entered the shop of some established pharmacist; after which he was considered qualified to become a master pharmacist upon his own account.

The number of establishments in a district was, by the municipal law of that district, limited; but the pharmacist was not allowed to take extreme advantage of this apparent monopoly, for the prices for dispensed medicines, and to a great extent for drugs also, were regulated by the authorities. The restrictions, therefore, upon perfect freedom of trade, which were so generally swept away at the beginning of the present century, were thus seen not to have been removed from the pharmacist, who always was, and still is, regarded as one of the servants of the State.

In a money point of view, perhaps, his remuneration might be deemed to be inadequate to his responsibilities; but he undoubtedly received more consideration from society than his comrade in England, and this, the lecturer thought, was mainly due to his higher scientific attainments.

The following were a few of the many opinions quoted by the lecturer:—

Professor Wackenroder, of Jena, thus defines the position of an apothecary (1851), "The German apothecaries are indirect servants of the State, therefore unsalaried and independent, who, under State supervision, by special permission practise an art, but enjoy the same right of property as every other citizen of the State."

Dr. Carl Müller, Professor at Halle, says, "In the present condition of German pharmacy one might well consider apothecaries as half State-institutions, the pharmacist himself, however, as a servant of the State, occupying an independent position, being a servant at his own risk, who does not cost the State anything, but who, nevertheless, gives to the State what can be required of a servant of the State."

Again, Buchner writes, "The objects of pharmacies prove that they are not free trades, but medical institutions, which have to subserve the general weal, and therefore cannot be managed *ad libitum*, but according to definite and general Government Institutions. The pharmacist cannot, therefore, be classed among the free tradespeople, nor among artisans or manufacturers or merchants, but in his functions occupies a position by the side of the physician among the functionaries of the public weal. In the free trades the egotistic principle is the ruling one. The tradesman always cares directly for himself and his own advantage; according to natural right he knows no other duties than those of every citizen of the State. The farmer may cultivate his field or let it lie fallow, just as he pleases or his sense of the advantages may dictate; the mechanic, the manufacturer produces his goods according to his own ideas, and directs his efforts into the channel of free-trade speculations. In like manner the merchant may open or shut his business, give up keeping any merchandise he pleases, or keep any article in various qualities, and sell it at different prices, as demand and luxury may dictate. The free tradesman therefore cares for others only indirectly, being directly only mindful of his own advantage. The servant of the State, however, the medical man, the pharmacist, in short, every one serving the State, cares directly for the nation, and the State, indirectly only for himself and his family; for he must always act as the State and the public good may dictate, must sacrifice his comforts, private advantages, nay, even his life, for the public welfare. He receives from the State definite instructions, and must solemnly subscribe to such instructions."

Proceedings of Scientific Societies.

LINNEAN SOCIETY.

January 19th, Mr. DANIEL HANBURY, F.R.S., F.L.S., read some "Historical Notes on the *Radix Galangæ* of Pharmacy." The drug known as Galangal has been an object of trade for many centuries between Europe and the East. It is a stimulant and pungent aromatic of the nature of ginger, which it might be used to replace; but the many virtues ascribed to it by the ancients must be ignored. It was apparently unknown to the Greeks and Romans; its introduction into Europe was due to the Arabians, in whose writings it is frequently mentioned, being an ingredient of the compound medicines then in use. This is as early as the tenth and eleventh centuries; in the fifteenth century it was already in common use in Europe. In 1563, it was first pointed out that there are two kinds of Galangal, the smaller kind or *Radix Galangæ minoris*, obtained from China, and the larger kind from Java. The latter, the *Alpinia Galanga*, Willd., is not known in Europe; the former, named by Dr. Hance *Alpinia officinarum*, is alone seen in European commerce. It is used, to a considerable extent, in the East as a substitute for ginger. Considerable quantities are annually sold in London, but entirely for shipment to the Continent, a large quantity being consumed in Russia. It is used by brewers, and also for the purpose of giving an aromatic flavour to vinegar. By the Tartars it is used as a tea, and in some places as a cattle medicine. During last year 2300 cwt. were exported from China.

SOCIETY OF ARTS.

On Fermentation.

BY PROFESSOR A. W. WILLIAMSON, F.R.S.

Lecture IV.—concluded.

M. Pasteur has introduced a process which, I gather from his statements, has already been adopted by a considerable number of wine-growers and merchants, which goes to the root of the matter in such a way as to leave nothing to chance, for he has proceeded upon the knowledge previously acquired by his accurate and masterly experiments, regarding the nature of all these little organisms, and the conditions which are favourable to their development, and which are destructive of them. He finds that when wine is heated to near the boiling-point, in any vessel in which it may be enclosed, and left in that vessel to cool, it may then be kept (provided the vessel be not opened) for any length of time without undergoing any of these deleterious changes. He finds also that so high a temperature as that I have named is not absolutely necessary, but that even if wine, which on keeping would be subject to the malady of acetification or ropiness, be heated to a temperature of 60° Centigrade (that is, about 140° in the clumsy and inconvenient scale which is still, I am sorry to say, in common use in this country), it will kill these organisms completely; and the experiment is so easily performed that any of you may do it with a very moderate amount of care. You ought to perform the experiment with several bottles at the same time, and to keep some similar bottles in the original state, in order to observe the difference. In the month of September, when I last saw M. Pasteur, he gave me several bottles of wine, some of which were in their original state, whilst the others had, after bottling, been heated to a temperature of 60°, or a little more. I have not yet opened any of them, but I have some of each sort here, and we will presently see what has been the result of the treatment. I ought to say that they have not been kept with proper precautions, for, on opening the case, I found that it had been left in such a position that the bottles had been standing with their necks upwards, which is not very favourable to the preservation of the wine. The experiment is so simple, that it is worth while for everybody to perform it. You should take some light wine, which you have reason to believe will not keep well; the bottles should not be too tightly corked, and there should be a little space left below the cork. You put several of these bottles into a vessel of water, cautiously if the water be warm, to avoid breaking them, and with them one bottle full of water, uncorked, you then warm the whole very gradually, until you find, by inserting a thermometer into the open bottle of water, that the temperature is up to 140° Fahrenheit; you then allow the whole to cool slowly. The corks are generally lifted a little by the expansion of the liquid and air within the bottles, and will require to be struck in again to their proper place. The same operation is performed on a large scale by wine-growers and merchants in France, in casks, and several contrivances have been described for the purpose. The simplest of all is to put a cask, with its bung upwards, into any convenient vessel of water, so placing it that the top of the cask is just above the water. The water surrounding the cask is then warmed gradually until it is found, by lifting the bung and inserting a thermometer, that the wine is of a temperature 60° or 70° Centigrade. The bung is then closed, and the whole allowed to cool. Another form of apparatus has been figured in a late book of M. Pasteur's on acetification, which consists of a cask with one of its ends removed, and replaced by a sort of double bottom of metal. This cask is then put on the fire, so that the water in the false bottom may be heated, and raise the temperature of the wine in the cask above, without danger of burning it. M. Pasteur recommends that when the wine has reached the right temperature it should be allowed to run, while still hot, into the cask into which it is to be kept, so that any little germs which may be present there may be as much heated as the wine which comes in contact with them. He heats the wine in this operation to about 65° or 70°, but he says there is reason to believe that even 50° is sufficient. Upon all occasions on which it has been tested it has been found that the little parasites which are present, and which are the seeds of the maladies of which we have been speaking—and, no doubt, other organisms—are changed in such a manner as to be practically dead. Whether they are susceptible of being revived is another thing. It is not known, and it is not affirmed that there are no germs which might not, by contact with oxygen, be afterwards brought into life; but practically there are no organisms in the wine, after that temperature has been applied to it, capable of growing in the closed vessel in which it is kept. M. Pasteur says that if the wine were, after that treatment, bottled, he would expect that some bottles would contain wine which would spoil, whereas the greater number probably would not, the reason being that the wine, on its passage from the cask to the bottle, would be liable to get some little germs from the air which possibly might retain some vitality, which would be stimulated by the oxygen. Therefore, all he affirms is, that when the wine is kept in the same vessel in which it was heated, it undergoes no further change whatever.

With regard to the ordinary process of aerating wine by keeping it in bottles, I should like to show you an experiment which illustrates, in a very simple way, what is a very familiar well-known fact. Every one who has had occasion to keep wine knows what an immense difference there is if you keep a bottle standing upwards or lying down. The difference is of this kind. If it stands upwards, the cork is dry, and air has access at a very rapid rate to the contents of the bottle, and the wine gets oxidized and spoilt; whereas, when the bottle is left lying down, the cork is wet, and the air has access much less rapidly,—in fact, only at such a low rate as is suitable for mellowing and improving the wine. I have here a couple of glass tubes, both open at one end, and closed at the upper end by a porous substance, which I may call a cork—it is, in fact, a cork made of plaster of Paris, a particularly porous substance,—one cork being wetted, so that the pores are full of water, whilst the other has been carefully kept dry, and this one is covered for the present with a little cap to prevent the access of the air. Here, in another vessel, is a mixture which is giving off hydrogen gas, which is passing upwards into these two tubes, one with a wet cork and one with a dry one. After a minute or two, both tubes will be full of pretty nearly pure hydrogen, and then we will remove them, and put the lower ends into this jar containing a coloured liquid. Most of you know that this porous substance allows hydrogen to pass through it more rapidly even than the air which is now outside passes in, and therefore as the hydrogen passes out of these tubes more rapidly than the air comes in, the liquid will be sucked up in the tubes, and we shall have a measure of the rate at which our gas passes through the wet cork and the dry cork, by noticing the difference in the rise of the liquid in the two tubes. If it passes quicker through the dry cork than the wet one, we shall find that the liquid will rise more rapidly in that tube, and I think you will find that the difference will be very great indeed. They are now both standing in the coloured liquid, and already there is a perceptible rise in the tube with the dry plug; but in the other one I cannot yet see the liquid at all. So it is in the simple case of a wine bottle. If the cork of a bottle is wetted, so as to allow an exceedingly slow diffusion of air through the contents, the wine gets very slowly oxidized, and undergoes only that gradual transformation which is wanted; whereas, in the other case, it is turned sour and spoilt by too rapid oxidation.

I could gladly have entered upon many other facts and considerations which belong to this subject, but one must stop somewhere. I cannot, however, part from you without expressing my very strong sense of the debt which we owe to that great investigator whom I have already quoted so many times. I think there are few precedents of research so fruitful as those of M. Pasteur, if we consider, not only the theoretical importance, I mean with regard to our knowledge of the processes of life, and the origin of life, of his investigations regarding germs in the air, and these processes of fermentation; but if we take into account also the fact that he has succeeded in working out one of the most complete practical applications of it in a process like wine-making and keeping,—we cannot refrain from admiring the truly perfect adaptation of the highest science to a useful purpose. I will now proceed to open these two sets of bottles, some of which have been heated and some not, and I hope the result will be satisfactory.

The samples of wine were then tasted by the audience, the difference being most remarkable, not only in taste, but also in colour and general appearance.

At the conclusion of the lecture, Mr. Foster, the secretary, proposed a vote of thanks to Professor Williamson, which was carried with acclamation, and suitably acknowledged.

LONDON INSTITUTION.

On Wednesday evening, Professor Tyndall delivered his interesting lecture on "Dust and Disease," in the theatre of the London Institution, Finsbury Circus. The theatre was filled with an audience of ladies and gentlemen, who seemed quite absorbed in the interesting experiments and the important facts brought under their notice. As the lecture is a repetition, with some slight variations, of the one which was delivered some time ago by the learned professor at the Royal Institution, it would be superfluous to enter into a repetition of details, but it may be generally stated that the object of the paper was to show that "dust" existed in abundance in the atmosphere; that, mixed with this "dust" were "germs" which were the origin of vegetable and even animal existence; that these were most injurious to health, and that it was now becoming an object with surgeons, and especially with Mr. Lister, of Edinburgh, to endeavour to prevent the entrance of these germs into the human body, in which, if they once got a lodgment, they produced fermentation and putrefaction. The air could be purified by strong heat, by chemical processes, and by filtration. The application of the latter method had already been productive of much good in certain trades. The lecturer was greatly applauded at the conclusion of his lecture, which lasted over an hour.—*Daily News.*

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 9 P.M.
London Institution, at 4 P.M.—"The First Principles of Biology" (Educational Course). By Prof. Huxley.

TUESDAY ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." Professor Foster.

WEDNESDAY...*Pharmaceutical Society of Great Britain*, at 8.30 P.M. "The Microscope and its Revelations." Dr. Carpenter.
Society of Arts, at 8 P.M.

THURSDAY......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." Professor Odling.
London Institution, at 7.30 P.M.—"The Action, Nature and Detection of Poisons." F. S. Barff.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.

FRIDAY ....*Royal Institution*, at 9 P.M.—"Some Experiments on Successive Polarization of Light made by Sir C. Wheatstone." W. Spottiswoode.

Parliamentary and Law Proceedings.

DEATH FROM AN OVERDOSE OF MORPHIA.

On Wednesday, January 18th, an inquest was held at Mossley on the body of a child eleven months old, the daughter of Mr. Henry Jones, chemist and druggist. On the 15th of December the child, being unwell, was seen by Mr. Dex Bean, surgeon, of Mossley, who intimated his intention of prescribing for it, and that a mixture would be supplied from his surgery. Upon returning home that gentleman, following his usual custom, wrote out a prescription in a book kept for the purpose. The ingredients ordered were two drachms of solution of tartarized antimony with syrup of hydrate of chloral, and colouring matter. This prescription was left to be compounded by his pupil, Mr. John Simeon Dyson, who had been employed in the surgery a year and three-quarters. Upon receiving the mixture, Mrs. Jones gave a teaspoonful of it to the child, who five minutes afterwards fell into a deep sleep. Mr. Bean, calling in the afternoon, noticed that the child was breathing very heavily, and had it removed from the cradle where it had been placed, when Mr. Jones, who was present, immediately exclaimed that the child was narcotized. It appeared to be perfectly comatose; remedies were applied without effect; convulsions followed, and the child died the following morning. After the death, Mr. Bean and Mr. Jones experimented upon a cat with some of the contents of the bottle. The cat was not affected until nearly an hour afterwards; it then became almost motionless, lying on the floor, discharging saliva from its mouth, and there appeared to be a contraction of the pupils of the cat's eyes. The animal recovered, however, and Mr. Jones's suspicions being somewhat allayed, the child was buried. After the burial he obtained an analysis of the contents of the bottle, upon the receipt of which he communicated with the coroner, and the body was exhumed.

At the inquest Mr. Bean, in his evidence, stated that in the surgery he kept a solution of hydrochlorate of morphia. The quantity of morphia he always used himself and directed Mr. Dyson to use was four grains to an ounce of water. The drugs were left to be compounded by his assistant, Mr. Dyson. No other person was authorized, or even able to compound the medicine. He had not interfered with the dispensing department for the last twelve months. He could not say where the bottle containing chloral was kept exactly. Mr. Dyson had had one and three-quarter years' experience in dispensing. The solution of morphia was kept in a violet-blue glass bottle with glass stopper. The solution of antimony was kept in a white flint-glass ounce bottle. In answer to questions put to the witness by a solicitor who was present on the part of Mr. Dyson, he said that Mr. Dyson had made up thousands of prescriptions, and had exhibited such an amount of knowledge of his profession as to cause no fear. He had often examined him as to his knowledge of the drugs he dispensed. Mr. Dyson had made them up without supervision for sixteen months. He considered the art of dispensing to be merely mechanical, and that the previous education of a person would not have much to do with it.

Mr. Edward Davies, F.C.S., of the Royal Institution, Liverpool, described the result of an analysis made of the contents of the bottle. He found chloral, morphia, sugar and some colouring matter, which he believed to be cochineal. He tested for antimony, but found none. On one occasion, when making experiments, he gave three grains of sulphate of morphia to a cat, and it produced no perceptible effect upon it. He could not say exactly how small a quantity of morphia would kill a child; but as the result of reading he should say that one-eighth of a grain would be sufficient. In the mixture he analysed there would be about one-fifteenth of a grain in each spoonful. The effects of a dose would depend, in a great measure on the idiosyncrasy of the recipient.

Mr. Bean, after hearing this evidence, said that he thought the comatose state had been produced by the morphia.

In consequence of Mr. Bean expressing an opinion that it would be difficult, from the decomposition of the body, to ascertain the actual cause of death, the jury decided not to order a *post-mortem* examination, and returned a verdict that the death occurred from misadventure, to which they added an expression of regret that the investigation had not taken place sooner.—*The Oldham Chronicle.*

Seizure of Worthless Tea in Dublin.

Some time since, in the London papers, there appeared an account of a vessel landing in that port, having on board a cargo of what is termed "lye tea." The cargo was condemned in London, but it seems to have found its way to Dublin, for in the Southern Divisional Court Mr. Norwood and J. O. Byrne applied for an order that some unsound tea should be destroyed. It was sold by auction in the Commercial Buildings, but the purchaser had it examined by the City analyst. The tea was found to be utterly worthless and useless. The Public Health Committee were apprehensive lest this kind of tea should get into circulation. Mr. Barton made an order for its destruction.

Sale of Petroleum without a Licence.

At Sheffield, on Monday the 16th inst., Mr. John T. Dobb, druggist, appeared in answer to a summons charging him with selling petroleum without having a licence. In September, 1869, Mr. Dobb applied at the town clerk's office for two licences for the sale of petroleum at his shops in West Bar and Meadow Street respectively. Mr. Dobb was not satisfied with the licences granted and desired to be allowed to sell two hundred gallons; this permission the General Purposes Committee of the Town Council would not grant. Mr. Dobb declined to take the licences for forty gallons, and since last September has been selling petroleum without holding a licence at all. He was fined £1 and costs.—*Grocer.*

Supposed Death from Subcutaneous Injection of Morphia.

An inquest has been held at Manchester on the body of Mr. Sutcliffe, late Physician's-Assistant at the Royal Infirmary, who was found dead. As it was generally reported that he was in the habit of using morphia by subcutaneous injection, a *post-mortem* examination was made.

Dr. Buckley deposed that there was no morbid disease sufficient to cause death. The liver and kidneys were diseased; the other organs were in a healthy state, but congested. There was also congestion of the membranes of the brain. He found no traces of morphia in the stomach. He understood that deceased had been in the habit of taking subcutaneous doses of morphia, and a dose acting on a depressed system might be fatal. A solution of morphia and a morphia syringe had been found in the deceased's room. The latter article might have been used, though he did not think it had. From what he knew of deceased, he did not think he would have intentionally taken an overdose of morphia.

The jury returned a verdict of "Death from toxæmia, aggravated by a dose of morphia taken as medicine to produce sleep."—*Medical Times and Gazette.*

Death from an Overdose of Opium.

An inquest was held recently at Mitcheldean on the body of Mrs. Masson, the wife of a surgeon. It appeared from the evidence that the deceased had suffered severely from neuralgia, and frequently took opium to relieve the pain. On the occurrence of the last attack she seems to have taken an overdose. Two hours afterwards she fell into a comatose state, and died within forty-two hours. A verdict in accordance with the evidence was returned.—*Standard.*

Review.

On a Localized Outbreak of Typhoid Fever in Islington during the Months of July and August 1870, traced to the Use of Impure Milk. By Edward Ballard, M.D. London: Churchills.

This interesting Report of Dr. Ballard's, read originally before the Association of Medical Officers of Health, and which has since appeared in a more or less complete form in several of the medical journals, has now been printed and published, in a pamphlet form, for that association, in compliance with a resolution passed, after the paper was read, by the members present. The subject of the paper, although at the first glance purely medical, is really one of such wide-spread interest, treated in so masterly a manner, that we gladly take the opportunity of its publication in a separate form to give a brief *résumé* of it, referring those of our readers who may desire fuller details to the pamphlet itself.

A serious outbreak of typhoid fever having occurred within a limited area in the parish of Islington, which is under the sanitary supervision of Dr. Ballard, he was induced to make a thorough investigation for the causes which led to so startling an event. In the course of his inquiries he found that between July 3rd and September 10th, 168 individuals, living in sixty-seven houses in this district, had suffered more or less severe attacks of typhoid fever, of whom twenty-six died. The area of the district in which these cases occurred is described as being the third part of the segment of a little more than half a circle, the radius of which is a quarter of a mile, formed by the North London Railway passing through it. Within the same period, in the whole of the rest of the parish (consisting of 3127 acres) there were twenty fatal cases.

To the inquiry, how did the disease originate? four different answers were suggested. These were—(1) some alterations made in the railway cutting by which an extensive surface of fresh earth had been exposed, and, it was alleged, several old sewers and drains had been cut across; (2) the smell proceeding from the dung-shoot in a large yard where several hundred horses were kept; (3) various local causes existing in the several houses invaded by the fever; and (4) the milk supplied by a tradesman in the neighbourhood.

Careful investigations, based upon the first three suggestions were made; but it was found that although they might possibly have been sufficient to account for a small proportion of the cases, yet that neither individually nor collectively were they sufficient to explain the large number that had occurred.

The fourth suggestion, that the disease had its origin in the supply of milk by a certain tradesman, was made under the following circumstances:—A lady, in whose family fever had occurred, was informed that four families of her acquaintance were also suffering from it. She remembered that she herself had, some little time before, changed her milkman, and had likewise induced these friends of hers to adopt the same tradesman. She formed her conclusions accordingly, and imparted them to her medical attendant. It happened that that gentleman had attended the family of this very milkman. He made some cautious inquiries, and found that out of eleven families, members of which were under his care for typhoid fever, ten of them were supplied with milk from the same source. This discovery being communicated to Dr. Ballard, led to further inquiries, resulting in the establishment of an evident connection between the cases of fever which had occurred, and the supply of milk from this particular dairy.

We have not space here to reproduce the evidence which led to this conviction, but will content ourselves with quoting a description of how the typhoid "picked out, as it were, the customers of this dairy in particular streets and rows of houses. Thus, in one long road, and a street issuing from it, at a distance of a mile or more from the dairy, it supplied three families; of these, two had typhoid. It supplied two families in a street with about thirty houses; one suffered from typhoid, in the other died an old lady from 'choleraic diarrhœa.' It supplied four families in a new neighbourhood of about seventy houses; three of these families had typhoid. It supplied four families in a crescent with twenty-five houses; all four had typhoid (in one only a single mild case occurred). It supplied four families in a row of nine houses; typhoid occurred in two of them, and in the other two, cases of a mild febrile character (not enumerated) occurred. It supplied four families in two opposite rows of houses, altogether about sixty-seven; three of them had typhoid happen in them. It supplied four families in a square with fifty-nine houses; all four had cases of typhoid happen in them, etc. And these were, so far as I can ascertain, the only cases in these several localities."

It is curious to notice how in families that were attacked, women and children, as those who ordinarily consume most milk, were the first to suffer.

"Thus, in the family living at the cowyard, the daughter, while engaged as a nurse in a situation, alone got the dairy milk with regularity, and she was the first attacked; the second case in this house (her mother) was a month later. In a family consisting of the father and mother, who never took any milk at any time, two servants and four children, all had typhoid, except the father and mother, the children commencing. In another family, consisting of mother, two servants, three girls and a boy of seventeen, one of the girls and the boy took milk porridge daily at breakfast; the other girls, with the mother, took little milk comparatively. The servants, complaining that the beer was sour, asked permission to have milk instead of beer. The girl and boy who ate porridge and the two servants were alone attacked. In another family, where a daughter aged eighteen and a son aged five years were attacked, the daughter, I was told, was a great drinker of milk, and she was attacked a fortnight before the son. In a house occupied by several families, using one privy, and where the drain-smells from an over-filled cesspool were very offensive, only one elderly man and woman were attacked. They alone drank milk from the dairy; the other families, being poor, had never any milk at all and altogether escaped. In another family, the only person attacked was a young girl, who, being in delicate health, took more milk than all the rest of the family. Mr. Clifton also told me of a case of typhoid, which is not enumerated here, in the person of a young lady whose family was supplied by some other purveyor, but who fancied to drink daily a glass of milk from the dairy in question. No one else in the house ever took this milk, and she alone suffered."

It is very significant that those families who lived in houses in which local causes of fever existed were the first to suffer.

And now having discovered the vehicle by which the fever was spread, and having narrowed the limits of the search, Dr. Ballard set to work with fresh zeal. By a process of exclusion he eliminated many possible and probable causes, and at length was led to the conclusion that the source of all the mischief lay in an underground water-tank. Upon this tank being exposed, it appeared that the wood of which it was made had rotted; and that by various rat burrows it was brought into connection with two drains, so that it was possible that under certain circumstances the sewage ran into the tank. The chief difficulty that now arose was the assertion that this water was never used to mix with the milk, but only for the horses, washing the cans, and general cleaning purposes. Even supposing this to have been the case, there would be a small quantity of the foul water left in the cans after washing, and considering the small admixture of sewage that will poison a well, and the fact that milk is a substance which has remarkable relations to chemical ferments, the author is disposed to think that sufficient of the poison would have existed in it to account for what occurred. But we think that it is hardly necessary to fall back upon so slight a cause, as although the statement of the family, "that if ever any water was added it was from the tap," might be true as to the rule, there may have been exceptions to it in practice, and the pump connected with the tank was so situated that it could not be seen from the master's house. At any rate, we do not see in what other way the following fact, ascertained since the reading of the paper is to be accounted for, as the drainings of the cans would have been as likely to affect one sort of milk as the other.

"In a street of about fifty villa residences, two of the houses only were supplied from the dairy. In only one of these did typhoid occur. The family consisted of the father and mother; three boys, aged two, four and five years; a baby, aged ten months; two servants and a governess. Two kinds of milk were supplied to the house from the dairy—namely, ordinary milk at fourpence per quart, and 'babies' milk' at fivepence. Only the baby got the latter. It was better than the ordinary milk, as 'it threw up more cream.' It kept well. The master of the house, on one occasion before the outbreak, had the curiosity to examine the ordinary milk with the sp. gr. galactometer, and following the directions accompanying the instrument, inferred that one-fourth of the bulk was added water. The youngest boy took most milk, but all three boys had bread and milk for breakfast. The boys and the mother were ill in the country, whither the family had gone for their summer trip. The youngest boy was the first attacked, on July 17, and was taken out of town the next day. The baby remained well, as also did the father, the governess and one servant. Of all the family, one servant only remained at home and continued to use the milk. She was taken ill about August 1 and had a sharp attack of typhoid. At the other house in this street, the part of the family at home during June, July and August was the father, mother and one servant. At this house nothing but 'babies' milk' was taken in, the extra price being habitually paid. No fever occurred at this house."

With this quotation we close, having given a brief outline of the subject of the pamphlet, but again recommending those of our readers who wish for further details to obtain it, and read it for themselves.

BOOKS RECEIVED.

Method and Medicine. An Essay. By Balthazar W. Foster, M.D. London: Churchills. 1870.

A Manual of Structural Botany, for the Use of Classes, Schools, and Private Students. By M. C. Cooke, M.A. With upwards of 200 Illustrations. Third Edition. London: Robert Hardwicke.

The following journals have been received:—The 'British Medical Journal,' Jan. 21; the 'Medical Times and Gazette,' Jan. 21; the 'Lancet,' Jan. 21; the 'Medical Press and Circular,' Jan. 25; 'Nature,' Jan. 19; the 'Chemical News,' Jan. 20; 'Journal of the Society of Arts,' Jan. 19; 'Gardeners' Chronicle,' Jan. 21; the 'Grocer,' Jan. 21; the 'Produce Markets Review,' Jan. 21; the 'English Mechanic,' Jan. 20; the 'Photographic Journal' for January; the 'Chemists and Druggists' Advocate' for January; 'Transactions of the Odontological Society' for January; 'Proceedings of the National Association for the Promotion of Social Science,' Jan. 12; the 'Manchester Courier,' Jan. 19; the 'Manchester Examiner,' Jan. 19; the 'Ashton Standard,' Jan. 21; the 'Oldham Chronicle,' Jan. 12.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[99.]—SHEET LIGHTNING.—"*Pestle and Mortar*" can prepare "Sheet Lightning" by following the directions of the B. P. for the preparation of pyroxylin, substituting paper for the cotton, and immersing it for a little longer time in the mixed acids. The best paper I have been able to procure for the purpose is Swedish filtering-paper, but should prefer a thinner paper, somewhat resembling "cigarette" paper, if able to obtain it sufficiently large. For blue fire, soak afterwards in a weak solution of chloride of copper; for red, use chloride of strontium.—H. J. BACON.

[115.]—MARKING-INK.—I have found the written portion sometimes destroyed, and have attributed it to want of care in heating the fabric, supposing the destruction to be caused by the letters on becoming dark rapidly absorbing heat, and thus charring before the white and unwritten part becomes discoloured. Perhaps also the effect may be heightened by the evolution of oxygen gas arising from the decomposition.—H. J. BACON.

[124.]—AFRICAN SAFFRON.—In answer to *X. Q. Z.* as to the source of the so-called African saffron, I beg to inform him that a correspondent of the *New York Druggists' Circular* lately suggested that it might possibly be derived from the *Lyperea crocea*, a South African plant, which is said to closely resemble saffron. But at a recent meeting of the Philadelphia College of Pharmacy, reported in the *Chicago Pharmacist* for December, a sample of this so-called African saffron was exhibited by Professor Maisch, obtained from the Chicago market, which upon examination proved to be *Carthamus tinctorius* (Safflower) in a broken and discoloured condition.—F. R. B. P.

[131.]—MOUTH WASH.—An excellent astringent lotion for the mouth can be made as follows:—

℞. Boracis ʒiss
Mel. Ang. ʒvj
Tinct. Pyrethri ℥ss
Tinct. Myrrhæ ʒiij
Aq. Fl. Aurant. ℥ij
Aq. Rosæ ad ℥vi.

"GIVE AND TAKE."

H. W. G. will find the following a first-class remedy:—

P. Aluminis ʒj
S. V. R. ʒj
Tr. Myrrhæ Simp. ad ℥ij.

To be used with a camel-hair brush after meals.—H. H. READ.

℞. Borax,
Alum,
Bay Salt, each ʒj
Sp. Camph.,
Tinct. Myrrh, each ʒj
Sp. Armoraciæ ℥ij.

M. Shake occasionally for a day or two, then filter. A teaspoonful in a wine-glassful of water, to rinse the mouth after cleaning the teeth, or at any time.—W. W.

[132.]—COUGH BALLS FOR HORSES.

℞. Antim. Tart.,
Digitalis, ana ʒss
Pot. Nitrat. ʒiss
Picis Liquidæ, q.s. ft. Bol.

Omni Nocte.—W. W.

℞. Rad. Scillæ 2 dr.
Gum. Ammoniaci 4 dr.
Ipecacuanhæ,
Opii, ana 4 dr.
Pimentæ 1 oz.
Bals. Sulphur. 4 oz.
Sapon. Castil. 2 oz.
Theriacæ q.s.
Ft. massæ pro Bol. no. vj.

One twice a day. W. W.

℞. Pulv. Scillæ ʒvj
Gum. Ammoniac. ℥ij ʒij
Gum. Opii ʒiij
Ol. Anisi ʒj

Mix and divide in six balls. M. S. P.

The following is a good form:

℞. Antim. Sulphurat. ʒiij
Camphor ʒj
Sulph. Flor. ʒij
Antim. Tart. ʒj
Sapo Mollis, q.s.

Ft. bol.

One every night or every other night.—R. ROGERS.

[133.]—CAMPHOR BALLS.

℞. Cetacei ʒiij
Ceræ Albæ ʒiv
Ol. Amygd. ℥j
Rad. Anchusæ, si opus sit.

Melt, then add—

Camphor. (Pulv.) ʒiij

Pour into small gallipots, so as to form hemispherical cakes.

W. W.

℞. Cocoa-nut Oil, 8 oz.
White Wax, 3 oz.
Camphor, $1\frac{1}{2}$ oz.

Melt the oil and wax together, and add the camphor previously pulverized.—S. D.

[135.]—ESSENCE OF JARGONELLE PEAR.—Acetate of Amylene is sold under this name. It is made by distilling a mixture of 1 part oil of grain, 2 pot. acet., 1 oil of vitriol. Wash the diluted liquid with alkaline water, agitate with chloride of calcium, and re-distil from litharge.—W. W.

[136.]—DISPENSING (SIGMA):

℞ Potassæ Chloratis ʒiv
Tinct. Ferri ʒiv
Aquæ ad iij. M.

"One teaspoonful in water three times daily."

It is impossible with that quantity of water to dissolve more than two-thirds of the chlorate of potash. Even boiling the chlorate of potash with the solution will not suffice, as it immediately re-crystallizes on cooling.—HENRY H. READ.

[*** The chlorate of potash should be rubbed down with the water, and a "shake-the-bottle" label affixed.—ED. PH. J.]

[142.]—CRIMSON MARKING-INK.—Can any of your readers give a formula for a good *stable* "crimson marking-ink?" I know the formula in PHARMACEUTICAL JOURNAL (Second Series, Vol. V. p. 188), but it has the disadvantage of degenerating in colour, in the course of a few weeks, to a dull brown shade.—R. G. H.

[143.]—DISPENSING.—I received to-day the following to dispense:—

℞. Collodion
Chloroform. pur., ana ʒij.

M. Paint the irritable parts every night with a camel-hair brush.

Can any of your readers inform me how I am to dispense it, so as to produce the result required? I have my experience of it, and so also had some one else, for it had been dispensed before *somehow*.—"VIATOR."

[145.]—GINGER ALE (AERATED).—Can any one give me a good recipe for making the above?—SODA-WATER.

Correspondence.

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

Proposed Regulations for Storing of Poisons.

Sir,—The storm of opposition which the proposed regulations for the keeping of poisons have evoked seems to have been noticed with amazement by the medical journals, and will probably excite the surprise and contempt of the House of Commons if the subject should come before them. That anything so simple and easy as an enactment which amounts to this, that certain deadly poisons named in a schedule, by the careless use and sale of which accidents have continually happened to human life, should be either kept separately in the way most convenient to the dealer, or, if not, marked distinctly from other things, should be so obstinately resisted,—will be one of the curiosities of pharmaceutical literature when the question is settled. The Council, too, are unreasonably assailed, as if they wished to force these regulations upon the trade against their will, in utter forgetfulness apparently that they were ordered to prepare them by the last annual meeting, and that the next will no doubt demand obedience to those directions.

We hear it vaunted loudly by some that such scientific men as chemists should be above legal restraint, but the gentlemen who make this assertion forget that there are a very large number of chemists and druggists placed upon the register who have never been examined at all, and who have equal right with themselves to sell and use the objectionable articles. The Council have been obliged by law to give this privilege to thousands, merely because they had kept open shop for the making up of prescriptions before the passing of the Act. Very many of these, there is reason to fear, are both careless in the way they carry on their business, and very ill-qualified to conduct it rightly. And those who so loudly put themselves forth as the types of the legal sellers of poisons should know that they are a minority, and a small one, of those to whom the regulations will apply. Mr. Vizer writes as though he had quite set the matter at rest with his typical surgeon and his lancets, etc., but, so far as argument in his letter goes, it is sufficient to say that if it were possible to show that in consequence of the negligence of medical men human life had been sacrificed until a cry of reprobation and alarm arose from every quarter, that it was sacrificed now and might probably be so in time to come, then it would be the duty of the Legislature to regulate the use of lancets, etc., in the hands of surgeons, whatsoever examinations they might have passed, and although they might have half-a-dozen letters of distinction appended to their names.

Some of your correspondents are indignant because the restrictions do not apply to medical men, but we have nothing to do with medical men; we have to regulate our own affairs, and if we have the good sense to do this properly we shall not have them to regulate ours.

Mr. Proctor, whose name always carries deserved weight with it, says that the only fault of the regulation is that it does not provide for the different grades of caution which the articles may require, so that morphia, etc., may be shut up in a cupboard, while such a thing is impracticable for syrup of poppies, etc.; but I maintain that this variety is the very thing which is given. You may seclude the most dangerous articles as closely as you please, whilst a different bottle or a capped one, or one with a mark upon it, will suffice for those which are mingled with the others. A more weighty objection—and the only weighty one that I can find—is this, that you introduce the thin edge of the wedge, which will lead to inspection and annoyance from public officers.

But those proposed will no more introduce the wedge than the last regulations did. We are living already under regulations as to how we shall sell poison, and neither the Privy Council nor any one else can set on foot inspection without an Act of Parliament, a thing wholly unlikely as long as we act up to the requirements of the Act we have already. But if, indeed, we refuse to do this, the Privy Council (backed by the Government) will most assuredly take the work into their own hands; and can any one who has observed the temper of Parliament, the press, the medical profession and the current of public opinion, doubt how it will be done? Does any one who has marked the career of former Poison Bills suppose that such an Act as we should have would be content with the few articles in schedules A and B? or that it would leave us the freedom which the present regulations afford? We may well dread inspectors, indeed, if the matter passes into the hands of a committee of the House of Commons. Look at the Petroleum Act. Suppose the dealers in this should say, We are men of considerable experience in business, we have much property at stake, we know best how to manage our own affairs, and these regulations are very troublesome and have caused many of us inconvenience and loss. Would not the reply be something of this kind? Very probably they may, but do you suppose we pass Acts of Parliament to please petroleum dealers? We have to consider what is best for the public and what regulations ensure safety to them. If those we have ordered are what you practise, so much the better; if not, you had better conform to them without delay. And if the legal restrictions pinched us pretty sharply, as no doubt they would, should we get any to pity us? Would they not say you have only yourselves to thank, they serve you right; you had the extraordinary opportunity afforded you of making rules to suit yourselves, and you were guilty of most extraordinary folly in refusing to do so.

It is, of course, in the power of the next Annual Meeting to talk great things and refuse to accept any regulations at all, and the Council will then probably transmit the answer to their Lordships and hand the matter over to them; but if the advocates of this proceeding imagine that thus poison regulations will come to an end, no greater mistake will ever have been made. If anything is certain it is this, that whether we like it or no, the Privy Council are determined that the intention of the Legislature shall be fully carried out, and that either with our consent or against it, poison regulations shall be made.

Opifex.

Sir,—The precipitate publication of Mr. Simon's letter having failed to produce the effect doubtless intended (viz., that of silencing our opposition) by those who were in such a terrible hurry to publish it to the members before it was even known officially to the Council, it seems now to be the cue of the "regulation" advocates (who, by the way, mostly write anonymously) to say that when the Pharmacy Act was passed, it was an understanding with the Government that the Society should make some regulations on the subject, and thus endeavour to convince us that we are morally bound to make a yoke for our own necks and a rod for our own backs, now they find that threats of governmental interference do not alarm us. This appeal to our moral sense is being pressed rather strongly into the service, but only to meet the same fate as the threat of parliamentary compulsion. If ever there were any understanding of the sort, it was kept remarkably secret and made known only to a very select few; the great bulk of the trade being certainly totally unacquainted with any such arrangement, and are not, and will not, be compelled to acknowledge as a duty that of which they had no cognizance.

In the Journal of December 24th there is a letter signed "Pharmaceutical Chemist" which contains some extraordinary statements. I always understood, as did most other people, and it was always so stated by the Pharmaceutical Council both in the Journal and elsewhere, that their primary object in promoting the Act was to secure the higher education of chemists, and that the poison clauses were introduced entirely against their wish in consequence of the action of other parties, whereas his statement would make it appear that the facts are exactly contrary. The preamble of the Act says "It is expedient for the safety of the public . . . that chemists and druggists should possess a competent knowledge of their business . . . and should be duly examined as to their practical knowledge;" and there is not one word in the Act to bear out his assertion that "opportunity was adroitly taken to introduce into the measure security for the higher education of chemists," but exactly the contrary; nor can I admit that "the primary object was the protection of the public from accidental and other poisoning" by means of poison schedules and regulations, as he would have us to believe.

As to the cry for some regulations, having waxed strong, the only outcry has been a few articles in a newspaper or two and in the medical journals (of course); but that the public have made any demand in the matter I utterly deny, and challenge "Pharmaceutical Chemist" to give a single instance of any such demand, except from newspaper writers and official persons.

With regard to the question of inspection, I would ask, are the proposed regulations intended to be observed or not? If not, it is useless making them; but if they are to be enforced, what other means is there but that of inspectors, unless we are to suffer the visits of a common informer like our Canadian brethren (see PHARM. JOURN. of Jan. 7th) whose case I commend to the consideration of all those desirous of adding to the annoyances we are already subjected to?

W. WILKINSON.

Cheetham Hill, January 24th, 1871.

MORE FETTERS.

Sir,—Time was when the greater included the less. The Pharmacy Act secured for the public of the future an educated body of chemists. In so doing, it provided the best possible guarantee against mistakes dangerous to life; but, no sooner has it become the law of the land, than a cry arises for more poison regulations. "Allow me to suggest more fetters," exclaims the medical officer of the Privy Council. "By all means!" reply half the chemists of the country.

As a humble unit of the other half, I ask leave to protest against the encumbrance, as altogether supererogatory, and a most strange instance of a requisition outliving the circumstances that gave it birth. The thing required is done; it was comprehended in the larger action already accomplished. To puzzle our heads about more poison regulations now, is to imitate the philosopher who, after providing a most ample entrance hole for the cat, was uneasy until he had contrived a small one for the kitten.

The public will be as safe with properly qualified chemists as they are with properly qualified medical men, whose dispensing arrangements, by the way, are so much less complete and precautionary.

I trust, therefore, the many reasonable objections to further restrictions will be represented with such force and persistency, that neither the Privy Council nor Parliament will wish to interfere with the method adopted by each examined and certified chemist, in performing the responsible duties of his profession.

Glastonbury. T. MAYHEW.

A DANGEROUS PRESCRIPTION.

Sir,—I had this morning brought to me a prescription, of which the following is a *verbatim* copy:—

℞. Tinct. Camph. Co. ℥vj
Acid. Hydrocyan. Scheele's ʒij
Glycerini ℥j
Aquæ ad ℥vj.
Sumat ℥ss 4tis horis.

It was for an old and regular customer; the medicine was wanted at once; and it was impossible at the time to communicate with the prescriber. What ought I to have done under the circumstances?

I am not sure that I did the right thing, but I used as much of Scheele's acid as I dare, viz. minims 20, and altered the prescription to that effect.

It makes one shudder to think what would have been the effect if this prescription had fallen into the hands of a raw apprentice.

In the course of twenty years' experience in a fair dispensing business, I can call to mind many cases where the prescriber has been at fault. SIGMA.

Pendleton, January 20th, 1871.

YORK CHEMISTS' ASSOCIATION.

Sir,—In looking through Mr. Schacht's excellent paper on "The Local Means of Pharmaceutical Education," I find mention of the "York Chemists' Association." My reason for thus troubling you is to ask, Is there such an Association, and (if there is) what are its objects?

I believe there formerly was one (hence Mr. Schacht's statement), but I think it is now extinct. If I should be mistaken in this supposition it is only natural, as it has kept itself so very, very quiet since the passing of the Pharmacy Act, that it is the only conclusion one could arrive at. Perhaps some of your readers can inform me; if they will, they will oblige

Bootham, York, Jan. 23rd, 1871. EXCELSIOR.

CHLORAL.

Sir,—As you have published in your paper an article written by Mr. Mason, containing remarks about the chloral-hydrate manufactured by us, which is calculated to injure our reputation considerably, we request you to insert at the same place in your paper the enclosed analysis of our chloral-hydrate, which will at once demonstrate the incorrectness, to use no other expression, of Mr. Mason's statement.

We shall send you a full refutation of the statement contained in the above article as soon as we have received the papers to which reference is made by Mr. Mason, but in the meantime request you to publish this letter at once, as a longer silence might increase the mischief already done.

Hanover, January 20th, 1871. E. DE HAEN AND CO.

[*** We willingly insert Messrs. De Haen's letter, and shall give due attention to the result of analysis which they have forwarded, and any further communication on the subject. The paper they refer to was published entirely on the author's responsibility as a statement of experimental results; and, as the question raised is one of great importance, we shall be glad to make known such additional data as may be useful for deciding the relative value of the chloral hydrate of various makers,—always providing that such data have direct reference to those points of interest with which pharmacists are properly concerned.—ED. PHARM. JOURN.]

DISPENSING ALLIANCES.

Sir,—Without entering on the question as to whether the prescriber is entitled to the lion's share of remuneration, or as to the relative status, expense of education, etc., of medical men and pharmaceutists,—I will simply state the understanding subsisting between myself and my brother, who is a chemist residing near me.

He dispenses my prescriptions at the usual "surgeon's prices," for which I pay him punctually every quarter, so my patients have but one account to meet, and that only at Christmas.

I have no interest in what are called "family articles,"—such as castor oil, cod-liver oil, linseed meal, extract of meat, etc.; these being paid for in the usual way.

You will observe that, under this arrangement, all "trade risks" are borne by the medical practitioner. And I can safely affirm that during the past two years I have attended numerous cases wherein I see no chance of being repaid for my outlay in medicines, much less for professional attendance; not to mention such trifles as a world-wide experience and a modest skill of twenty years' standing and cultivation.

Nevertheless, I for one regard this arrangement as "a step in the right direction," viz. towards laws which shall prohibit the practice of dispensing drugs by medical men, and of prescribing on the part of pharmaceutists.

For, when once dispensing is confined to pharmaceutists, I believe it will result in great convenience to the public, both in town and in country places. Under such a system, a chemist or a person possessing technical knowledge, would be required in every large village, wherein he would probably combine the duties of postmaster, telegraphist, etc.

JOHN HUDSON, L.R.C.P. LOND., etc.

75, *Mostyn Road, S.W., January 24th.*

J. S. (Edinburgh).—Attfield's 'Chemistry,' p. 573.

A Minor Associate.—The iodine combines with the strychnia to form hydriodate. London West-end houses would charge from 8*s*. to 10*s*.

F. A. H.—See the list of manufacturers of scientific apparatus given in answer to a correspondent at p. 480.

"*Donato Commasi.*"—We have received a communication in which reference is made to some directions for the preparation of charpie, etc., which have not come to hand.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. H. Allman, Mr. S. Robinson, Mr. W. Smith, Mr. J. Hudson, Mr. R. T. Hudson, Mr. C. A. Bell, Mr. W. R. Dennis, Mr. E. Davies, Mr. Hustwick, J. H. W., W. A., W. G., J. B., A. P. S., C. E. M., T. M., N. H. M., "Pestle and Mortar," "Inquirer," "Octavius," "Alveolus," "Carolus," "Olivina," "Delta," "Moderation," "Excelsior."

THE QUALITY OF CHLORAL HYDRATE.

BY B. H. PAUL, PH.D.

Considering the importance of the question that has been raised as to this preparation and as to the substitution for it of another compound of chloral—the alcoholate—possessing therapeutic properties different from those of true chloral hydrate, it seemed to me worth while to make an examination of some samples as they are met with in the market and in use by dispensers.

The data given by Mr. Mason in the paper read by him before the Liverpool Chemists' Association on the 22nd December, and subsequently published in this Journal, would appear to indicate at least the existence of a very great dissimilarity in the chloral preparations manufactured by different firms; for even on the assumption that the samples referred to by Mr. Mason were all choral hydrate, the data he gives as the results of his analyses would indicate an inferiority of some samples to the extent of 20 per cent. as compared with others, besides at the same time suggesting the possibility that some of these samples might consist of chloral alcoholate.

For the objects necessary to be kept in view in this Journal, it does not appear to me either requisite or desirable that, in considering the question as to the quality of chloral preparations, there should be any reference by name either to the particular makers or dealers from whom certain samples have been obtained. The great point is to ascertain whether any such variation in quality as that pointed to by Mr. Mason's results does really prevail, so as to be of practical importance in regard to the medicinal use of this drug. I shall, therefore, abstain from any mention of names either of the manufacturer or others from whom I have obtained samples for examination, and will content myself with stating my results merely in reference to numbers and to the characters of the preparations operated upon.

Adopting the ammonia test originally suggested by Mr. Williams, and since worked out in detail by Mr. Umney, I have applied it to the examination of twelve samples of chloral preparations which were obtained from various sources, and were all furnished to me as being chloral hydrate representing the supply now in the market.

Each of these samples was treated in the manner described by Mr. Umney, a somewhat smaller quantity, however, being taken for the experiment.

According to the composition of pure chloral hydrate, 100 grains of it should yield in this way 72·2 grains of chloroform, or 72·2 per cent. by weight. That quality of chloroform having the density of 1·497 would be in volume 48·2 grain-measures, so that 100 grains of pure chloral hydrate should yield by decomposition with ammonia, that measure of chloroform.

In like manner 100 grains of the compound of chloral with alcohol would by decomposition with ammonia yield 61·75 grains of chloroform, or 61·75 per cent. by weight, this being in volume 41·2 grain-measures.

The following are the results I have obtained for 100 grains of each preparation examined:—

No. of Sample.	Characters.	Volume of Chloroform obtained. Grain-measures.	Equal to Grains weight.	Percentage of Chloroform by weight.
1.	White amorphous dry lumps	46·1	69·1	69·10
2.	Hard transparent fragments of crystals	48·0	71·8	71·86
3.	Thin translucent crystalline cake	48·0	71·8	71·86
4.	White opaque cake, apparently not quite dry, especially at one surface	42·0	62·8	62·87
5.	Very small crystals, aggregated into translucent lumps, with a slightly moist appearance	47·0	70·3	70·36
6.	White semitranslucent cake, with slightly moist appearance	48·0	71·8	71·86
7.	Translucent crystalline cake, consisting of small scaly crystals, moist and greasy to the touch	47·5	71·1	71·10
8.	Large tabular crystals, like chlorate of potash	44·0	64·8	64·86
9.	Translucent lumps, consisting of scaly crystals, slightly moist to the touch	45·0	67·3	67·36
10.	Small acicular crystals, apparently breaking up into scales when rubbed in the hand, slightly moist to the touch	47·0	70·3	70·30
11.	White opaque lumps, resembling effloresced carbonate of ammonia, with distinct crystalline fracture, translucent at the interior and greasy to the touch	46·5	69·4	69·40
12.	Chloral alcoholate*	37·5	56·1	56·13
13.	Pure chloral alcoholate	41·2	61·7	61·76
14.	Pure chloral hydrate	48·2	72·2	72·20

* For the specimens I am indebted to Mr. John Williams.

These results differ widely from those reported by Mr. Mason, and it will be seen that, so far as the samples I have obtained represent the chloral preparations of commerce, there does not seem to be a very great difference of quality if the yield of chloroform be taken as a criterion.

To a certain extent I believe this may be done; but at the same time, on looking over the results given in the table, it will be seen that those samples which consisted of crystals almost invariably gave the largest amount of chloroform.

This fact, together with the more definite character of the crystallized chloral hydrate, as compared with the cake, induces me to suggest that, for dispensing purposes, the material should always be used in the state of crystal. I do not believe that the difference in price would be anything worth regarding as an obstacle to that practice; but in making this suggestion it is necessary to particularize the kind of crystal to which I refer, for there are several kinds of crystallized or crystalline chloral preparations. That which I believe to be the purest, presents commonly the appearance of ordinary alum broken into fragments about the size of grains of paradise (in one instance I have met with very definitely formed crystals resembling sulphate of potash); the fragments are perfectly transparent, free from powder, possessing very little odour, and when turned out upon the hand they feel dry and do not become moist by exposure.

This appears to be the form in which chloral hydrate is most definite and uniform, and, therefore, best suited for dispensing purposes, quite independently of its being obtained from any particular maker.

But there are several other varieties of crystals: sometimes the preparation is in the form of minute acicular crystals, like chloride of ammonium; sometimes it has the appearance of chlorate of potash, and sometimes it is in definite needle-shaped crystals, like oxalate of ammonia. Very frequently these crystals are more or less moist in appearance, and on exposure this character becomes more marked. The definite needle-shaped crystals last mentioned are, I believe, characteristic of the alcoholate. I have only met with one sample of this kind in commerce, and have not yet obtained a sufficient quantity of it for analysis. As regards the other acicular and tabular crystals, however, they appear to be decidedly inferior to that form of crystallized chloral hydrate described above, and they do not seem to be very much preferable to the cake.

Still none of the samples give results at all approximating to those which would be obtained from alcoholate, nor does it appear that any of the samples examined contained less than 87 per cent. of chloral hydrate. In the case of that sample which gave the lowest result, there was a copious separation of a flocculent humus-like substance between the chloroform and the supernatant liquid, and that obscured the true volume of the chloroform layer. The same deposit was found to some extent in testing other samples.

According to the analysis made by Mr. Eugene De Haen, and referred to last week in the letter from Messrs. De Haen, the choral hydrate they make gives the following results:—

Boiling-point.	Chloroform Layer (after the List of Mr. Mason).	Quantity of Chloroform produced from 500 grains of the Chloral compound by weight.	General Remarks.
Centigr. 97°	Grain-measures 240	353 grains, or 71 per cent.	A crystalline cake (crystal) soluble in water, ether, alcohol; insoluble in chloroform, etc.; has all attributes of a really chemically pure chloral-hydrate.

Since writing the above Messrs. Domeier have forwarded a letter, which appears in the Correspondence columns, and the results of two analyses by Dr. Versmann, which are as follow:—

Samples.	Boiling-point.	Chloroform layers, grain-measures.	Quantity of Chloroform from 500 grains hydrate by weight.	Corresponding to percentage of pure chloral hydrate.	General Remarks.
Crystals . .	96° to 97° C.	235 grs.	357·8 grs. or 70·3 p. c.	97·43 p. c.	Fine white crystals, slightly deliquescent, dissolved very freely in water, dissolves in alcohol, ether, etc., not quite insoluble in chloroform.
Cake . . .	96° to 97° C.	232 grs.	347·3 grs. or 69·4 p. c.	96·20 p. c.	White opaque cake, not quite dry, readily soluble in water, alcohol, ether, etc., not quite insoluble in chloroform. Both begin to solidify after having been melted at 49° C.; specific gravity of liquid at that temperature is 1·610.

Both samples are pure chloral hydrate, which have by exposure to air attracted some moisture, which is the cause of the deficiencies in the percentage.

After decomposition with ammonia and separation of chloroform, no crystals of iodoform could be obtained from the solution, proving the absence of any alcohol.

In reference to Mr. Abraham's remarks on the ammonia test as reported in the proceedings of the Liverpool Chemists' Association, I may remark that care must be taken to ensure completion of the reaction before reading off the volume of chloroform. Of course the temperature to which the tubes have to be heated must be regulated by the nature of the product. A temperature of 100° F. maintained for three or four hours is quite enough. Meanwhile, the tubes should be well shaken. If these precautions be not observed, probably very little chloroform may be produced, or it may happen that the chloroform-layer appears to be much larger than it ought to be. In such cases it will be found that after some hours rest, crystals separate from the chloroform. This latter circumstance is due to incomplete decomposition of the chloral hydrate and its solution in the chloroform produced, apparently with increase of volume. On heating a tube in this condition, the recommencement of the reaction will be at once apparent, and after cooling, the chloroform layer will be found reduced to its true volume.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

CERII OXALAS.—$Ce\,C_2\,O_4\;3\,H_2\,O$.

[§ A salt which may be obtained as a precipitate by adding solution of oxalate of ammonia to a soluble salt of cerium.] The chloride may be employed.

[§ A white granular powder, insoluble in water, decomposed at a dull red heat into a reddish-brown powder (a mixture of $Ce\,O$ and $Ce_2\,O_3$), which dissolves completely and without effervescence in boiling hydrochloric acid, and the resulting solution gives with solution of sulphate of potash a white crystalline precipitate (of double sulphate of cerium and potassium). If the salt be boiled with solution of potash and filtered, the filtrate is not affected by solution of chloride of ammonium (showing the absence of alumina); but when supersaturated with acetic acid it gives with chloride of calcium a white precipitate (oxalate of calcium) which is soluble in hydrochloric acid. Ten grains when incinerated lose 5·2 grains in weight.] That is, a residue of oxide weighing 4·8 grains is left. If it consisted solely of cerous oxide $Ce\,O$, the residue would weigh 4·6 grains, but a small quantity of peroxide is always formed; thus the slight increase in weight is accounted for.

CHLOROFORMUM.—$C\,H\,Cl_3$.

Into a capacious still is introduced a quantity of rectified spirit diluted with much water. Heat is applied, and when the temperature reaches 100° F., a mixture of slaked lime and chlorinated lime is added. When the mixture commences to froth, the fire is removed, and in a short time the process is complete. There is no necessity for continuing the application of heat any length of time, as the whole of the chloroform comes over at the commencement.

The product is purified by washing it first with water, then with strong sulphuric acid; finally it is dried and purified from traces of acid by redistilling it from a mixture of chloride of calcium and dry slaked lime.

Chlorinated lime is an agent capable of acting by supplying either oxygen or chlorine. Thus it may split in a manner represented by either of the two following equations—

$$Ca\,Cl\,O\,Cl = Ca\,Cl_2 \quad + \quad O.$$
$$\text{or } Ca\,Cl\,O\,Cl = Ca\,O \quad + \quad Cl_2.$$

In the production of chloroform it acts both ways. First the alcohol is believed to lose hydrogen and become converted into aldehyd,

$$C_2H_6O + O = C_2H_4O + H_2O.$$

Then the aldehyd is acted upon by the chlorine from another portion giving chloral, which in its turn is decomposed by the lime into chloroform and calcic formate.

$$\underset{\text{Aldehyd.}}{C_2H_4O} + 3\,Cl_2 = \underset{\text{Chloral.}}{C_2HCl_3O} + 3\,H\,Cl.$$

$$2\,\underset{\text{Chloral.}}{C_2HCl_3O} + Ca\,2\,H\,O = \underset{\text{Formate of Calcium.}}{Ca\,2\,C\,H\,O_2} + 2\,\underset{\text{Chloroform.}}{C\,H\,Cl_3}.$$

The chloroform distils over, the formate remains mixed with the excess of lime and water in the retort. The slaked lime employed is not absolutely necessary, but prevents irregularities in the decomposition.

The foregoing explanation of the reaction is rendered probable by what we know of chloral. This body in the form of hydrate is now familiar to every one. It is made by passing dry chlorine gas into absolute alcohol.

$$\underset{\text{Alcohol.}}{C_2H_6O} + 4\,Cl_2 = \underset{\text{Chloral.}}{C_2H\,Cl_3\,O} + 5\,H\,Cl.$$

When treated by alkalies it breaks up as shown in the equation already given. Ammonia is employed when it is desired to test it quantitatively. By the amount of chloroform produced, the proportion of real chloral present can easily be calculated.

The sulphuric acid employed to purify chloroform must be free from all traces of oxides of nitrogen; for it has been shown that the apparently spontaneous decomposition to which chloroform is sometimes subject is to be attributed to contamination of this kind.

The best indication that chloroform is free from noxious impurities is that it evaporates from the hand without leaving a residue or odour of any kind. Admixture of spirit would be indicated by the specific gravity.

Chloroform is still sometimes called perchloride of formyl, in accordance with the supposition that it is a chloride of an assumed radicle $(C\,H)'''$, formyl, the existence of which is doubtful. All the different views which may be held respecting the constitution of chloroform in reality amount to one and the same thing; in this body we have an atom of quadrivalent carbon united with and saturated by the four univalent atoms, one of hydrogen and three of chlorine.

By dissolving chloroform in spirit of wine acidulated with hydrochloric acid, to which a few drops of perchloride of platinum have been added, and digesting the mixture upon granulated zinc in a flask to which a Liebig's condenser is attached, dichloride of methylene is gradually produced, and distils over.

$$C\,H\,Cl_3 + H_2 = C\,H_2\,Cl_2 + H\,Cl.$$

Dichloride of methylene has been tried with some success as an anæsthetic, but its production in quantity is uncertain and difficult.

By submitting chloroform to the action of excess of chlorine, a liquid, tetrachloride (formerly called bichloride) of carbon, $C\,Cl_4$, is produced.

These bodies form part of a series which well illustrates the law of "substitution;" for they may all be formed simultaneously by the action of chlorine upon marsh gas,—the atoms of hydrogen in that body being one after the other replaced by equivalent chlorine atoms.

Marsh gas or methyl hydride . .	$\overbrace{H\,H\,H\,H}^{C}$
Methyl chloride or methyl-hydrochloric ether	$\overbrace{H\,H\,H\,Cl}^{C}$
Methylene dichloride	$\overbrace{H\,H\,Cl\,Cl}^{C}$
Chloroform	$\overbrace{H\,Cl\,Cl\,Cl}^{C}$
Carbon tetrachloride	$\overbrace{Cl\,Cl\,Cl\,Cl}^{C}$

THE ADULTERATION OF SAFFRON.

BY JOHN INGHAM.

Notwithstanding the recent remarks that have been made by different writers upon the adulteration of saffron, there seems to be no improvement in the article as met with in commerce.

I hope that this additional exposure of the enormous extent to which the adulteration is practised, may be a step towards putting a stop to it, by concentrating the attention of the trade more fully upon the subject.

Towards the close of last year I ordered a small quantity of crocus sativus opt. from one of the oldest drug firms in London, a house whose drugs generally are to be relied upon for purity as much as those of any other firm; yet the saffron supplied at the rate of 56*s*. per lb. contained from forty to forty-five per cent. of impurity. Bearing in mind Mr. Daniel Hanbury's remarks on this article, I determined to examine what I had. On close scrutiny with the naked eye I could see it had *much* foreign matter attached to it; on applying a little HCl brisk effervescence immediately commenced.

In order to ascertain to what extent the fraud had been carried and what was the adulterant, I took 1 drachm of the saffron and washed it two or three times with water in a beaker, mixed the washings, allowed the precipitate to deposit, and decanted off the clear liquid. The sediment, when dried till it ceased to lose weight, weighed *twenty-seven grains*. Surprised to find so large an amount, I thought that some heavier adulterant than carbonate of calcium, perhaps sulphate of barium, might have been employed also. On treatment with HCl, brisk effervescence ensued, and the greater part was dissolved. This portion was easily proved to be nothing more than carbonate of calcium. The portion insoluble in HCl was equally so in aqua regia. I endeavoured to treat in the usual manner for insoluble sulphates as also for silica, but was unable, with the means at my command, to obtain sufficient heat to fuse it when mixed with a proper flux. From its appearance to the eye I think it is only sand. The quantity compared with the chalk was small, it may probably have been a mechanical impurity in the latter. After such a result I hardly anticipated finding that there was a still greater sophistication, yet I felt curious to continue my investigation a step further.

Placing a small portion upon the surface of some hot water, I soon perceived some yellowish portions, which I had previously taken for stamens, unfolding themselves, looking very like ligulate florets; in my readiness to believe, I nearly mistook them for such; they were, however, only stamens. These constituted fully 1 per cent. I do not know the origin of this saffron, but I should think it is a very bad specimen of the worst Alicante Mr. Hanbury examined. From the immense time and labour requisite for the gathering of saffron, it must of necessity always be a costly article; and so long as there is a ready market for such qualities as have lately been selling, doubtless the supply will be kept up, and be very profitable to those primarily concerned.

The remedy is chiefly in our own hands; if we refuse to use, or have anything to do with such qualities, it will soon be found more remunerative to supply a genuine article, even if a higher price must be charged. I am no advocate for cheapness if any advantage is to be gained by higher prices; yet, in conclusion, I cannot help reiterating what has often been said before, that a drug so costly and of so little therapeutical value should be, as soon as possible, ordered much less than it is in our Pharmacopœia, or be altogether expunged from it.

THE COMPOSITION OF THE FERRIC IODATES.

BY CHICHESTER A. BELL, M.B.

The ferric biniodate having been recently proposed as an addition to our list of medicines, and successfully employed by many physicians in Dublin, it appeared desirable to investigate the chemistry of a substance which seems destined to come into more general use. The compound hitherto employed, however, is both expensive and tedious to prepare, and is, moreover, liable to decomposition, although very much more stable than the ferrous iodide as a substitute for which it was introduced. With the view, therefore, of devising a more simple and rapid mode of preparing it, or of finding some similar and equally efficacious compound, a few experiments were undertaken, and with the following results:—

There appear to exist, at least three well-defined compounds of ferric oxide and iodic anhydride. One of these, the biniodate, is formed by precipitating a solution of iron alum by one of potassic or sodic iodate added in excess. This is the compound recently proposed for use in medicine, and to it the formula $Fe_2O_3, 2I_2O_5, 8H_2O$ has been correctly assigned. When first precipitated it is of a yellow or yellowish-brown colour; but it soon becomes darker on exposure to air, at the same time evolving an odour of iodine. If now to a solution of ferrous iodide one of potassic chlorate be added, and then an excess of strong nitric acid, upon heating the mixture a fine yellow precipitate is produced. The formation of this substance is often remarkable, the iodine which was at first set free disappearing suddenly when the yellow precipitate appears. The composition of this precipitate corresponds to the formula $Fe_2O_3, 3I_2O_5$ or $Fe''' 3IO_3$. It is, therefore, a normal iodate. It contains 9·64 per cent. of iron and 65·57 per cent. of iodine, while the percentages of iron and iodine in the crystallized ferrous iodide of the Pharmacopœia are about 15 and 67. It is scarcely soluble in cold water and dissolves with difficulty even in strong nitric acid. Like other iodates it is readily attacked by warm moderately dilute hydrochloric acid, chlorine gas being produced. Boiling water takes up from it both ferric oxide and iodic anhydride, a basic salt remaining undissolved. It is destitute of both flavour and odour. It possesses the advantage over the preceding compound of being anhydrous and perfectly stable. The most suitable proportions for its preparation seem to be, 2 parts iodine converted in the usual manner into ferrous iodide in solution in 5 or 6 parts water, 2 parts potassic chlorate dissolved in a small amount of hot water, and $1\frac{1}{2}$ parts strong nitric acid.

When only a small quantity of nitric acid is added and the mixture heated to boiling, a considerable amount of iodine escapes, while a deep red precipitate is formed. The composition of this precipitate, when dried at 212° F., appears to be normally Fe_2O_3, I_2O_5. It soon, however, decomposes, even during washing, and the proportion of iodic anhydride is accordingly liable to vary. Prepared with a larger quantity of nitric acid its colour is lighter, while it contains a greater percentage of iodic anhydride. When the amount of acid is not quite sufficient to cause the formation of the normal salt, the resulting precipitate is probably a mixture of normal and basic iodates. Digestion with warm dilute nitric acid converts any of these basic mixtures into the neutral compound.

Of these three ferric iodates the normal compound would seem the best suited for medical use in consequence of its great stability. The iodates as a class undoubtedly require further examination.

THE APPLICATION OF DISINFECTANTS.

Now that smallpox, fever and other contagious diseases are prevalent amongst us, the knowledge of how to apply the substances which are used as disinfectants is of much importance. The chemist, as the vendor, is often consulted as to the best way of using a certain disinfectant, and having ascertained the purpose for which it is required, should be able to give a judicious and ready reply.

First among disinfectants is carbolic acid. Its universal adaptability, its extensive use in most of the metropolitan hospitals, and during the cattle plague, entitle it to this rank. It has advantages which no other disinfectant can boast of, being capable of application either as a fluid or as a vapour; the fluid not injuring the fabric to which it is applied, and the vapour when breathed being comparatively harmless.

There are several ways of applying this substance. In solution, a good strength is one part of the crystallized acid to thirty of water. This is suitable for sprinkling the floor, clothing, bedding, etc. A very good way of using it is to keep clothes continually wetted with it, and suspend them in the room. For pouring down drains and the immersion of linen and other infected articles, one in fifty is strong enough. As vapour it may be evolved by keeping a solution of the first strength constantly evaporating; or another more simple and effectual method is to make a fire-shovel hot and pour upon it a little of the strong solution at regular intervals. The patient and those in attendance should likewise wash with carbolized soap.

Manganate and permanganate of potash are valuable as disinfectants and deodorizers on account of their oxidizing powers in the presence of organic matter. The Pharmacopœia solution of the permanganate is strong enough for all the purposes to which it can be applied. If the patient drinks much water, a few drops of this solution in each glassful will do good. As a wash for the mouth, one drachm to an ounce is a suitable strength. All utensils for the reception of evacuations should be charged with this solution. For sprinkling the floors, clothing and bedding, and pouring down drains, two drams to the ounce should be used. A weaker solution is very useful for rinsing the hands.

Chlorinated lime is a substance so well known, and its application so simple, that most persons are instructed in its use; its cheapness recommends it to the poorer classes, and, I believe, its use is generally appreciated by them. In places where it is strewn, it should be renewed every twenty-four hours, as by that time it generally loses its freshness. A portion of it placed in a pail of water for the washing of floors is a wise precaution at all times.

Sulphurous acid gas is liberated by burning sulphur. It is a powerful destroyer of the germs of contagion, but owing to its deleterious and suffocating odour it cannot be introduced in any quantity to the room of a sick person; nevertheless, it is very useful.

Mr. Startin, the senior surgeon to the Hospital for Diseases of the Skin, Blackfriars, in a communication to the *British Medical Journal*, recommends the following method of fumigation to be used for the purpose of preventing the spread of contagious diseases. For disinfecting beds and bedding, a warming-pan or some other suitable utensil, containing a few live embers, upon which a teaspoonful or two of flowers of sulphur has been thrown, should be passed to and fro between the sheets until the combustion of the sulphur is complete. After a few minutes the patient may enter the bed. Should the fumes prove too stimulating for his respiratory organs, they may be intercepted by holding a loosely folded damp handkerchief before the mouth until they have subsided. To disinfect clothing it should be lightly sponged or sprinkled with water containing well-mingled milk of sulphur, in the proportion of a teaspoonful to a pint of water, and then ironed with a flat iron, heated to a temperature sufficient to volatilize the sulphur without burning the clothing. This process should be repeated according to the extent and duration of the infection.

Dr. Walter Fergus, writing to the same journal, says that he has found the readiest method of developing sulphurous acid fumes to be by igniting two parts of flowers of sulphur and one of powdered charcoal on any incombustible surface, such as a saucer or a bit of tin. He says also that sulphurous acid is not so much an irritant as it has the appearance of being. An atmosphere highly charged with it may be breathed with very small inconvenience, which soon passes off. Dr. Fergus has used it with benefit in cases of the affection known as "hay-fever."

A correspondent says, in reference to the above method, that it is open to several objections. He much questions whether a patient could remain in the room after the burning of two teaspoonfuls of sulphur; under any circumstances it would produce a most irritating cough, even if the wet handkerchief were applied to the mouth, as there is a limit to the absorption of this gas by moisture. The hot cinders are not necessary for its ignition, the sulphur will readily take fire, and burn on the application of a lucifer match.

The disinfecting properties of chlorine are well known. It can be eliminated by the action of hydrochloric acid on chlorinated lime, or sulphuric acid on peroxide of manganese and salt. From its poisonous properties it is open to the same objections as sulphurous acid; the same rules may be observed for its application.

In conclusion, we give the following list of precautions adopted in a recent case of typhus fever. When the medical attendant discovered the nature of the case, he ordered immediate disinfection with carbolic acid and Condy's fluids. The room in which the patient lay was stripped of the whole of its furniture, leaving nothing that was not required for the use of the patient. The floor was then washed with a solution of chlorinated lime, and afterwards well sprinkled with solution of carbolic acid one to thirty. Cloths kept wet with this solution were suspended in the room, and the bedding was lightly sprinkled. Three times a day, at regular intervals, a drachm of the strong acid was poured upon a hot fire-shovel and moved about the room. All clothing, bedding, etc., when removed from the patient, was immersed in a solution of the acid one to fifty. He was washed with carbolized soap. All utensils for the reception of evacuations were kept charged with Condy's fluids; a weaker solution of the same was used as a gargle. This plan was strictly followed for three days, when the patient sank and died. As soon as possible after death the fireplace and windows were securely closed, and a tablespoontul of sulphur placed in a vessel and ignited. The door was then closed, and the room left in this condition three hours, after which the windows were opened from the exterior. Soon afterwards the remains were placed in a shell containing charcoal. The paper was then stripped from the walls, and the sulphur process again repeated. The room was kept closed in this condition for two days, when the body was removed.

As destroyers of atmospherical germs of contagion, sulphurous acid and chlorine are perhaps the best agents; but, in consequence of their irritating effects, their application is much restricted in the sick-chamber.

THE SALTS OF CERIUM AND OF LITHIA.*

The salts of cerium were first introduced as remedial agents by the late Sir J. Y. Simpson,† and the oxalate was admitted into the second edition of the British Pharmacopœia. Sir J. Y. Simpson considered them to possess sedative and tonic properties, which make them useful substitutes for bismuth, hydrocyanic acid and nitrate of silver. He used them with marked advantage in "chronic intestinal eruption," in irritable dyspepsia, attended with gastrodynia, pyrosis, and chronic vomiting, and in the vomiting of pregnancy. In epilepsy and other allied convulsive diseases in which the nitrate of silver has been frequently employed, the salts of cerium possess the advantage over the nitrate of silver, that they may be persevered with without any fear of discolouring the skin. The oxalate has obtained a great reputation as a remedy in obstinate vomiting, especially in the vomiting of pregnancy.

The remedy possesses the great advantages of smallness of dose (gr. iij–v) and freedom from taste and smell.

Lithia and its salts were also introduced into the British Pharmacopœia of 1864. More than thirty years ago, Mr. Ure and some other authorities called attention to the remarkable solvent powers which the carbonate of lithia possessed over uric acid calculi—powers which much exceed those possessed by the other alkaline carbonates,—and suggested the injection of solutions of the carbonate of lithia into the bladder, with the object of dissolving calculi formed wholly or in part of uric acid. But it was Dr. Garrod who introduced the lithia salts into medical practice. Extending the experiments of Mr. Ure, etc., he found that the carbonate of lithia could completely remove gouty deposits of urate of soda from cartilages incrusted by them, while carbonate of potash acted less strongly on them, and carbonate of soda left them unaltered. This encouraged him to make trial of the lithia salts clinically, and with highly satisfactory results. He found them of great value for keeping uric acid in solution during its passage through the urinary organs, and for preventing its deposition in the structures of the body; it seems, also, that they may be of service in removing gouty concretions when formed. The carbonate is a much more powerful diuretic than the salts of potash or soda, and may be given with great advantage, as a prophylactic, in chronic gout, calculus, etc. Its dose is from three to six grains, and is best given in a state of free dilution. The value of the lithia salts, especially the carbonate, has been widely recognized. The lithia springs of Baden Baden ‡ have gained a considerable reputation, and Professor Roscoe has found lithium in the thermal waters of Bath. Dr. Garrod has stated that he has known a few, but a very few, instances "in which the long-continued use of the drug has appeared to cause symptoms referable to the nervous system, as shaking or trembling of one hand, which has disappeared on the omission of the remedy." §

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* Abstracted from a series of papers on the "Progress of Therapeutics," published in the *Medical Times and Gazette.*

† *Monthly Journal of Medicine*, December, 1854; "Obstetric Memoirs," etc., p. 313, 1855; and *Medical Times and Gazette*, vol. ii. p. 280, 1859.

‡ Dr. Althaus, 'On the Lithia Springs of Baden Baden,' *Medical Times and Gazette*, vol. ii. 1861.

§ 'Essentials of Materia Medica,' third edition, p. 105, 1868.

THE USE OF PREPARATIONS OF CARBOLIC ACID IN SMALL-POX EPIDEMICS.

Although carbolic acid is not a preservative enabling us to dispense with vaccination, it is nevertheless a disinfecting agent which it is advisable to employ as a prophylactic. In a hygienic point of view it is thought worth while to call attention to two new preparations, or rather two different forms of the same preparation, which are due to MM. Dubarth and Rolle.

The best method of employing carbolic acid as a disinfectant, according to M. Dubarth, is to mix it with a coarse powder, which being saturated with it so divides the acid as to present the largest possible surface for evaporation. For this purpose powdered brick affords an excellent vehicle, at once convenient and easy in its use.

The following is the manner in which he prepares this mixture, to which he has given the name of "Dubarth's Disinfectant."

Powdered Brick	5 kil.
Carbolic Acid	250 gr.

Dissolve the acid in a sufficient quantity of alcohol and then mix. A thin layer of this powder spread upon a plate, frequently stirred and slightly damped, produces at the ordinary temperature a much larger quantity of antimiasmatic vapours than would be given off by any solution of carbolic acid. It is superior to the solutions of permanganate of potash, its effects being more constant and more certain.

The following is the method proposed by M. Rolle for making carbolicized cigarettes:—

Powdered Plaster	100
Carbolic Acid	20

Dissolve the carbolic acid with a sufficient quantity of alcohol, and sprinkle with this solution the granulated plaster. Stir with a spatula in order to secure an equal distribution of the active substance, then introduce the granules into the hollow portion of a quill, of which the ends are closed with a little wadding, as is done in the case of camphor cigarettes.

As an agent in the treatment of confirmed small-pox, carbolic acid has been largely experimented with since the first trials by M. Chauffard, with results proportionate to the gravity of the evil. Professor Godefroy, of Rennes, has had three cases of small-pox, in which he has obtained such satisfactory results by the use of it, that he has published the particulars in the *Revue de Thérapeutique Médico-Chirurgicale.*

The first was the case of an unvaccinated adult, suffering from semiconfluent small-pox. The prescription ordered was—

Mixture of Acacia (Potion gommeuse, Fr. Codex)	125 grammes.
Crystallized Carbolic Acid	1 ,,

Two tablespoonfuls to be taken every two hours.

The following lotion was to be applied every hour to the face and hands:—

Crystallized Carbolic Acid .	5 grammes.
Distilled Water	500 ,,

There was no suppuration.

The second case was that of a confluent variolic eruption. The same treatment was adopted. There was no suppuration.

The third case was an infant of eighteen months. The eruption was moderate. Without ceasing to suck, this child took a teaspoonful of a solution of 30 centigrammes. The hands were bathed with a lotion made according to the formula previously given. It recovered.

It is well to remark that these three cases were too slight to decide in favour of the efficacy of carbolic acid; but they at least prove that the acid can be administered without inconvenience.—*Echo Médical et Pharmaceutique Belge.*

DR. LANKESTER'S REPORT FOR 1870.

It appears from an analysis contained in this Report that in cases of suicide, women, as a rule, prefer taking poison and drowning themselves. Of twenty-three cases of female suicide in 1868–9, six were from poison and ten from drowning. Men, on the other hand, adopt the more violent methods, such as cutting their throats, hanging, jumping out of windows, etc.

With regard to poisons, the third on the list of means of suicide in proportion to their frequency, it will be seen "that during the past seven years the most frequent deaths have arisen from cyanide of potassium. This is a most deadly and certain poison. It can be bought of almost any druggist or seller of photographic chemicals, without any questions being asked. It is used in immense quantities by photographers, and every amateur photographer possesses a certain quantity in his stores. It is well known in families where it is sold and used as a poison. It is in this way the most readily accessible, and perhaps the best known of all poisons, as it is generally labelled, when sold, as 'poison.' On this account it seems to offer a terrible temptation to those inclined to commit suicide. Thus the word 'poison' only acts as a preventive of accidental poisoning, for persons disposed to commit suicide might know nothing of the properties of a substance unless it was thus labelled. In a recent case of poisoning by Calvert's carbolic acid, used for disinfecting purposes, the bottle containing it not being labelled 'poison,' the mistress of a family told her servant she must be very careful of the acid as it was a strong poison. The consequence was that the girl got up in the night and swallowed a quantity of the carbolic acid, and was found dead the next morning. Labelling poisons 'poison' will not prevent suicide, nor will any restriction on the sale of poisons prevent suicide. The only restriction that can be of any service is on the sale of poisons, which may easily be administered to other persons on account of the small bulk or absence of any physical property, and which can be easily employed for the purposes of murder. There is no doubt that writing the word 'poison' frequently prevents accidental poisoning, but I am of opinion that nothing will prevent this amongst ignorant and careless people but the sending out of poisonous substances in bottles or boxes that should at once be recognized by the sight and feeling as devoted to the reception of poisons alone.

"The next most frequent agent used in suicidal poisoning is oxalic acid. This is used by saddlers and harness-makers, shoemakers, and also for certain household purposes. Just as photographers and their wives and families poison themselves by cyanide of potassium, so shoemakers and saddlers and their wives and families poison themselves with oxalic acid. It is seldom taken by mistake or used for purposes of murder; it is usually sold with the word 'poison' written on it, and is well-known as a tolerably efficacious poison. I say tolerably, because I believe cases of recovery from oxalic acid poisoning are much more frequent than from cyanide of potassium.

"After these two instances come the preparation of opium. These cases are not so numerous as formerly, and even my tables seem to point to a decrease. The facility of obtaining cyanide of potassium and oxalic acid may explain this. The chemist and druggist is very careful over the sale of laudanum, selling it only in small quantities, and then only to persons whom he supposes are not going to misuse it. But in the great majority of cases where persons take laudanum for suicidal purposes, they have bought it in small quantities and added them together, and thus have taken sufficient to effect their object. But a large number of the cases of poisoning by opium or its preparations arise in druggists' shops and medical men's dispensaries, to which servants or others desirous of committing suicide have access.

"This is more so the case with hydrocyanic or prussic acid. In nearly every instance of suicide by poisoning with this agent, it has occurred with medical men, druggists, or their families and servants. It may be bought, but great precautions are taken in the sale, and its sale and use is almost entirely confined to chemists who make it, druggists who sell it and medical men who employ it.

"Poisoning by oil of bitter almonds comes next. It is used as a scent and also employed to flavour food. The few cases which have occurred during the last seven years are principally amongst servants and courtesans. It is easily procured in druggists' shops. It should, however, be known that the essential oil of bitter almonds is not a poison, and it is only when it is impure and contains hydrocyanic or prussic acid that it acts as a poison. I have never held, that I recollect, an inquest in a case of accidental poisoning from oil of bitter almonds, as it is never taken in sufficient quantity when used as an article of diet. It is, however, an unpleasant fact to know that you may be taking a dose of hydrocyanic when eating a custard at dinner.

"Following oil of bitter almonds in the number of their victims are sulphuric and hydrochloric acids. These articles are known in commerce as oil of vitriol and spirit of salt, and are used for various purposes and by various workers. They are known to be poisonous, but they are generally known also to kill by their caustic action on the flesh of the body. The death which follows the swallowing either of them is most agonizing and cruel, the victim frequently not dying for some hours, or even days, after taking them. They are employed by persons who are too poor or too ignorant to have recourse to anything else. The drunken brass-finisher, or his wife, or any other artisan who works at his business with these materials, in the moment of frenzy, seize on one or other of these acids which may be nearest to them, and thus finish their existence by one of the most painful deaths that man can die.

"The last substance mentioned is strychnia. It is contained in powders sold for the destruction of vermin. In the two cases recorded the strychnia has been taken in this way."

POISONING BY BATTLE'S VERMIN KILLER.

We have been favoured by a correspondent with the following account of a case of poisoning by Battle's Vermin Killer, that has come under his notice:—*Jan.* 7, 1870, 12.30. I was called to Mrs. —, who I was told was dying. On arriving I found her in tetanic convulsions and quite asphyxiated. She recovered from the convulsions just after my arrival, when her father told me she had taken a 3*d*. packet of Battle's Vermin Killer. She gave me the key of her box, where I found one empty and another full packet of the above poison. She said she had taken it thirty minutes before. I immediately ordered her a mustard emetic, and hastened back for antidotes. On arriving again in about five minutes, I found she had vomited a quantity of green fluid, and that another convulsion was just commencing. I gave her a few whiffs of chloroform, which relieved it, and then another emetic mixed in strong coffee. About 12.45 I administered "ʒij of chloral hydr." in a little starch as an injection, after which she had "*no more convulsions*" and slept, waking up every hour till 5 next morning. On seeing her about 9 she said she had only a little pain in her legs, and felt rather languid. The next day she was out of bed, sat up, and is now perfectly recovered.

COUGH REMEDIES.

As at this season of the year, and more especially the present year, succeeding to the great and long-continued heat of last summer and autumn, coughs, colds and catarrhs, and all of this class of affections of the bronchial membrane of the air-passages are prevailing to an unusual extent, it will be found convenient to be able to turn readily to a well-established formula that may afford relief to persons thus affected, and perhaps have the good fortune to make a cure. Therefore, to that end—

1. Take Syrup of Squills,
Syrup of Ipecacuanha,
Camphorated Tinct. of Opium, of each, 1 oz.

M. Dose, a teaspoonful for an adult every three hours.

It promotes expectoration and causes relaxation.

2. Take Syrup of Wild Cherry Bark, 3 fl. oz.
Syrup of Tolu, 1 fl. oz.
Prussic Acid, diluted, 16 minims.

M. Dose for an adult, a dessert-spoonful every three hours. Tonic and sedative, and is highly useful in consumption.

3. Take Syrup of Gum Arabic, 4 fl. oz.
Muriate of Morphia, 1 gr.
Oil of Sassafras, 1 drop.

M. Dose, a teaspoonful every three hours.

This is like Dr. Jackson's well-known "Pectoral Syrup."

4. Take Powdered Ext. of Liquorice,
Powdered Gum Arabic, of each, 2 drms.
Hot Water, 4 fl. oz.

Make a mixture and add—
Spirit of Nitrous Ether, 1 fl. drm.
Antimonial Wine, 2 fl. drms.
Tincture of Opium, 40 minims.

M. A tablespoonful for a dose.

This is an excellent remedy in the early stages of catarrh; it is the well-known *Brown Mixture*, or the "mistura glycyrrhizæ composita" of the U. S. Pharmacopœia.

5. Take Decoction of Senega, 4 fl. oz.
Syrup of Ipecac. 1 fl. oz.
Syrup of Squills, ½ fl. oz.
Tartrate of Antimony, 1 gr.

M. A teaspoonful for children two years of age and over. This is often given in croup.

6. Take Gum Ammoniac,
Ext. of Liquorice, of each, 2 drms.
Vinegar of Squills, ½ fl. oz.
Fennel Water, 5½ fl. oz.

M. Dose, a teaspoonful for an adult every two hours.

A stimulating expectorant in chronic bronchitis and catarrh.

7. Take Muriate of Ammonia, ½ oz.
Powdered Gum Arabic, 2 drms.
Powdered Ext. of Liquorice, 3 drms.
Water, 6½ fl. oz.
Spirits of Nitrous Ether, 1½ fl. drm.
Vinegar of Squills, 3 fl. drms.

M. A dessert-spoonful every two hours.

A stimulating expectorant and alterative, and may be given in the advanced stage of bronchial disease.

8. Take Copaiba,
Balsam of Tolu,
Powdered Gum Arabic, of each, ½ oz.
Water, 6 oz.
Aromatic Sulph. Acid, 20 minims.

Make a mixture by well rubbing together.

Dose, a tablespoonful. Given in chronic catarrh and bronchitis.

9. Take Hypophosphite of Lime, 6 drms.
Hypophosphite of Soda,
Hypophosphite of Potash, of each, 2 drms.

Dissolve, strain and add—
Hot Water, 10 fl. oz.
Sugar, 14 fl. oz.

Dissolve, with a mild heat, strain and add—
Orange-flower Water, ½ fl. oz.

M. Dose, a teaspoonful every three hours.

The hypophosphites are recommended by Dr. Churchill in phthisis and bronchitic consumption.—*The New York Druggists' Circular.*

Eye Seed.—A correspondent in the *Gardeners' Chronicle*, says that some years ago, being on a tour in North Wales, he saw a plant—which some of his friends who were with him knew as Clary, and others as Wild Sage—growing plentifully in the ruins of Denbigh Castle. The man who was in charge of the ruins gathered some of the berries, and recommended them to the party as a wonderful cure for eye disease. His mixed Welsh and English was difficult to understand, but the point appeared to be that the seed was good for checking inflammation, and might be placed whole under the eyelids without doing harm. The plants appeared to agree with the description in Loudon's 'Encyclopædia of Plants' of the wild Clary, the *Salvia Verbenaca;* they were labiate, about a foot high, and the flowers were of a bluish purple. The time of the year was about the beginning of July.

Female Pharmaceutists in Holland.—According to the editor of the *Pharmaceutische Zeitung*, at the examination for pharmaceutical assistants recently held in Amsterdam, nine female candidates made application, five of whom had been educated there at the industrial school. The commission of examination was fully satisfied of their capability. The *Pharmaceutical Weekly* of Holland reiterates the views expressed on a former occasion, that these girls (Meisjes) are not adapted for city pharmacies, but that in the country, where the prescription business is naturally limited to certain hours, and where they could find time for improvement in domestic duties, they might become useful and valuable assistants.—*American Journal of Pharmacy.*

Chloride of Lime as a Cargo.—The National Company's steamship 'England,' which sailed for New York on the 12th instant, put back into Queenstown under the following circumstances. During a gale several barrels of chloride of lime, which formed part of the cargo, burst, the fumes arising from which compelled the firemen to leave the stokehole. With considerable difficulty, the men employed in the duty being nearly suffocated, five barrels were got on deck and thrown overboard. It was then deemed prudent for the safety of the passengers that the vessel should not continue her voyage. Several bucketfuls of rats were found dead from the effects of the lime.—*Standard.*

Examination of the Bark of Coprosma grandifolia for Alkaloids.—Mr. Skey, analyst to the Geological Survey of New Zealand, reports that he has examined a specimen of the *Coprosma grandifolia* and found that alkaloids generally, and those of the quinia group particularly, are either entirely absent, or present only in so minute a quantity that the bark has no value as a drug on that account. The bark examined was bright yellow on its inner surface, very bitter and had a slightly hot, pungent flavour. Mr. Skey considers it the bitterest of any of the barks of that family that he had seen. The method adopted for the examination was as follows:—A decoction of 200 grammes of the pulverized bark in weak hydrochloric acid was slowly evaporated to half an ounce and then filtered. The filtrate yielded no precipitate with sulphocyanide of mercury, sulphocyanide of zinc or tannic acid. These reagents give dense precipitates in a very weak decoction of the common grey bark.—*Chemical News.*

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 4, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*

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

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BETTS SUITS.

The present number contains a report of the proceedings before the Lord Chancellor upon the Appeal presented by Mr. Betts for a reversal of the decision given by Vice-Chancellor James. Mr. Betts has again failed, and it may now, we hope, be anticipated that the last has been heard of his remarkable pretensions.

As upon the former occasion the case was not disposed of upon the general question whether if Mr. Betts had proved an infinitesimal and innocent infringement, he would have been entitled to an injunction and damages, or in short would have been justified in filing his twenty-five Bills. The Plaintiff's counsel, in fact, failed to establish any case of infringement, and the Lord Chancellor upon that ground rejected the application. It will be well for the result of the case not to be misunderstood in these respects, because nothing has happened in the course of the proceedings to encourage a retailer in knowingly dealing in, or using even to the most limited extent, any article made in infringement of patent or other protected rights.

The judgment of the Vice-Chancellor (Third Series, Vol. I. p. 32) evidently discouraged suits against innocent persons until after reasonable warning given to them, followed by continued infringement of rights; the judgment of the Lord Chancellor is not at variance with those views, and, indeed, remarks (not reported) made by his Lordship during the arguments were in accord with the Vice-Chancellor's expressions on the subject.

The course of the contest illustrates the advantage resulting from mutual help; it is impossible to keep out of view the probabilities that a wealthy experienced and resolute litigant such as Mr. Betts might have had an easy victory against the twenty-five (and possibly more) Defendants, had each been left unaided. Upon the actual result we may once more congratulate the Defence Committee and all parties interested.

Some light was thrown upon a development of the pernicious system of "coaching," adopted by some teachers in preparing pupils for certain examinations, by a case that came before the magistrate at Bow Street on Friday last. Charles Gerrard, described as a teacher, living in Lincoln's Inn Fields, together with another man, were charged with inciting a person in the employ of Messrs. Rivington, the printers, to steal an early proof of one of the examination papers of the Apothecaries Hall. It appeared that the prisoners had been for some time trying to obtain a copy, and at length, by arrangement with the police, the proof-puller was allowed to supply them with two copies, for which he received ten pounds. A detective then immediately arrested the prisoners, while the proofs were in their hands. They were both committed for trial.

It is announced by the Committee of Publication of the *American Journal of Pharmacy* that an Index to the forty-two published volumes of that journal is being prepared, and that it will be published if a sufficient number of subscribers can be obtained within six months.

Mr. Jabez Hogg has been appointed Surgeon to the Royal Westminster Ophthalmic Hospital, in succession to Mr. Hancock, Vice-President and Examiner of the Royal College of Surgeons.

The Catalogue of the Class of the Philadelphia College of Pharmacy for the Forty-ninth Session, 1870–71, numbers one hundred and ninety-eight names.

It is interesting to note that in a recent case the use of a poison label nearly contributed to produce the result it was intended to avert. A woman, wishing to commit suicide, drank a considerable quantity of a lotion from a bottle which was labelled poison, in the hope of effecting her object. As it happened, however, the lotion was a very harmless one, a quart of which would not have hurt her, and so the desired result was not obtained.

At a meeting of the Executive Committee of the British Pharmaceutical Conference, the Secretaries stated that the financial position of the Conference was such as to warrant them in providing for the production of a Year-Book for 1871. The Committee of Publication were accordingly instructed to make arrangements for its issue. Mr. Charles H. Wood, F.C.S., was elected Editor. A vote of thanks was ordered to be conveyed to Mr. Joseph Ince for his services in editing, at a short notice and much personal inconvenience, the Year-Book for 1870.

Proceedings of the Pharmaceutical Society.

MEETING AT EDINBURGH.

The Second Meeting of the present Session of the North British Branch of the Pharmaceutical Society was held at Edinburgh on Monday, 23rd January; Mr. W. Aitken, President, in the chair.

Professor Balfour delivered a lecture on ipecacuanha root (*Cephaelis Ipecacuanha*). He referred to it as a valuable remedy in disorders of the mucous membrane, of the bronchial tubes, etc., but more especially in dysentery. In India it formed, when combined with opium, as valuable a remedy in cases of dysentery as quinine in fevers. He stated that, owing to the careless manner in which the natives collected the root, the plant was rapidly decreasing in Brazil, and that the British Government were now taking active steps to have it introduced and cultivated in India. For this purpose a great number of young plants are being propagated at the Royal Botanic Garden under the care of Mr. M'Nab. There are evidently two varieties of the plant; one has been growing in the garden for at least forty years, while the other was only sent to the garden in a living state about a year ago by Dr. Gunning, from the neighbourhood of Rio Janeiro. The old plant is that which was described and figured by Sir William Hooker in the *Botanical Magazine*, as having been sent to him from Mr. Makoy, Liége. The leaves of this plant are more leathery in their texture; their form more elliptical or oval; their apex less pointed and their edges wavy; there are fewer hairs on the surface and the stem is more shrubby than in Dr. Gunning's recently-imported plant. It also flowers readily after a year's cultivation from slips and the style is short. The Rio de Janeiro plant has not yet produced flowers at the garden, and therefore a full description cannot yet be given. The Professor then gave a history of the ipecacuan plant from its earliest mention by Michael Trestram, who called it Igpecaya or Pigaya, up to the present time. He described the mode in which the root was collected and dried. The gatherers of the *poaya* (the name applied by the natives to all roots used as ipecacuan) are called poayeros, and a skilled poayero can gather in the course of a day about thirty pounds of root. Under the name Ipecacuan many plants are mentioned belonging to different genera, or even to different natural orders. All of them, however, agree in possessing more or less emetic qualities. A figure of the ipecacuan plant was given by Piso in the 'Travels in Brazil,' undertaken by himself and Marcgrave, but it was not such as to enable botanists to determine the genus and species. At that time all annular emetic roots got the name of ipecacuan, and the different kinds were distinguished by their colour: thus we had brown, grey, red, black and white ipecacuan. The first accurate scientific description of it was by Brotero, in the Linnean Society's 'Transactions' for 1800, and subsequently a full account was published by Achille Richard in his thesis on the 'Natural History of Ipecacuan.' Professor Balfour gave a full botanical description of the true ipecacuan plant and showed its relation to other plants in the same natural order. He also gave descriptions of the following plants, used in different parts of the world as ipecacuan:—*Psychotria emetica* (striated ipecacuan), *Richardsonia scabra* (white ipecacuan), *Ionidium ipecacuanha* (false Brazilian ipecacuan), *Manettia cordifolia*, *Euphorbia ipecacuanha*, *Polygala poaya* and *Tylophora asmatica*.

The lecture was illustrated by a beautiful series of large water-coloured drawings, executed by Mrs. Balfour, of the various plants referred to and their structure; by sections under microscopes, prepared by Mr. Sadler; by dried specimens from the University Herbarium, and by living plants from the Royal Botanic Garden.

On the motion of the President, seconded by Dr. A. M'Donald, a cordial vote of thanks was given to Professor Balfour for his interesting and instructive lecture.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

The Second Meeting of the Session was held on Monday evening, November 14th, 1870; Mr. William Smeeton in the chair.

Messrs. George William Highmoor, Thomas Edward Parkinson, and George William Roberts were duly elected Associates of the Society.

A vote of thanks was unanimously passed to Messrs. Southall, Son and Dymond, of Birmingham, for their valuable present to the Association of a box containing specimens of the organic constituents mentioned in the British Pharmacopœia.

After an alteration of Rule number 4, Mr. Edward Thompson was elected Vice-President.

Mr. Smeeton, the President, then favoured the meeting with an address. He strongly urged and inculcated upon Associates the duty of acquiring information, and of laying in a solid stock of knowledge, so as to be able to pass their examination with credit. Several phases of education were touched upon, and after a free conversation a vote of thanks was passed to the chairman.

The Third Meeting of the Session was held on Thursday evening, December 22nd, 1870; Mr. E. Thompson, the Vice-President, in the chair.

Mr. Samuel Jefferson, F.C.S., was duly elected a member of the Association, and Messrs. George Iredale and Frederick Plint were elected Associates.

The paper of the evening, on "The History of a Fungus," was then read by Mr. James Abbott. The lecturer explained the views of botanists and mycologists with regard to the cell-formation and reproductive characteristics of fungi, and then proceeded to enlarge upon the latest accepted theory of botanists on the formation of ergot in rye. The medicinal and poisonous properties of ergot were also remarked upon. The lecture was amply illustrated by diagrams and specimens, and after an animated discussion a vote of thanks was passed to Mr. Abbott for his highly useful discourse.

The Fourth Meeting of the Session was held on Wednesday evening, January 25th. Owing to the absence of the President and the Vice-President, Mr. John Day was called to the chair.

Mr. John Henry Wright was elected an Associate.

The Secretary then introduced the subject, "Dispensing; or, Who ought to do it?" The reader of the paper first endeavoured to define the terms dispensing and medicine, and then assumed that two classes only could be supposed equal to the duties of dispensing, viz. the medical and pharmaceutical professions. He afterwards entered into certain abstract and practical arguments to prove that chemists were better qualified to dispense than surgeons. The Secretary also brought forward facts and arguments to prove that the public interest and safety would be materially advantaged by placing the dispensing of the whole country in the hands of the chemists. During a friendly discussion, it was proposed to appoint a deputation from the Association to wait upon the officers of the Leeds Medical School, to point out to those gentlemen the desirableness of dispensing duties being performed in the future by chemists and druggists alone.

It was ultimately proposed by Mr. E. Brown, seconded by Mr. E. F. Atkinson, supported by Mr. Crosby, and carried, that the Secretary be desired to lay the subject before the Committee, and that the Committee be requested to report upon the matter at the next monthly meeting.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Sixth General Meeting was held at the Royal Institution, on Thursday evening, January 19th; the President, Mr. John Abraham, in the chair.

Several donations to the Library and Museum were announced.

Mr. John Shaw announced that he had been authorized by the Local Committee of the British Pharmaceutical Conference to place £32. 15*s.* 4*d.* (the balance of the fund raised to entertain their pharmaceutical brethren in September last) to the funds of the Association.

Mr. Edward Davies, F.C.S., drew attention to the case of accidental poisoning at Mossley, and detailed the result of his analysis of the medicine administered to the child, the detection of morphia, etc. He also made some remarks upon the evidence given at the inquest, and the experience of the physician's assistant as a dispenser.

The Secretary called attention to the report, published in the *Lancet* of 14th January, of Dr. Lankester upon the inquests held in Great Britain in 1868–69 upon suicidal cases, and thought regulations for the storing of poisons by chemists could not prevent such cases of poisoning as those mentioned.

Mr. Thomas F. Abrahams stated that the results of Mr. Mason's experiments, as detailed by him in his paper, read at the last meeting, induced him to make a few experiments, which he described.

The first trial was with some of Liebreich's chloral. The percentage of chloroform produced was by weight 71.

The second was with some of the crystal chloral (Sample No. 5). The quantity of chloroform produced was so small that he did not estimate it.

The third was with the *same* chloral (crystal), and the quantity of chloroform produced was by weight about 70 per cent.

The fourth trial was made with samples of Liebreich's and the crystals simultaneously. The same quantities were used. The tubes were of about the same diameter (possibly a matter of some importance), and were placed in the same jug at the same time.

The quantities of chloroform produced were, as nearly as possible, identical, viz. 70 to 71 per cent. by weight.

The chloroform layer from Liebreich's chloral deposited a white crystalline mass. That from the crystals did not deposit, but was more deeply coloured.

The conclusions he drew from these experiments were, that the crystal chloral, as far as this mode of testing shows, is quite equal to Liebreich's, and that the instructions given by Mr. Umney are insufficient, in that they do not prescribe the temperature of the water into which the tubes are to be plunged.

He intended, however, to make a further trial, and use more care in the manipulation.

A discussion followed, in which Messrs. Davies, Abraham, and the Secretary took part.

Mr. Alexander Fraser read an interesting and practical paper, giving the results of his experiments with some officinal and non-officinal remedies, concentrated infusions, etc. He condemned the practice of those who would, by *private judgment*, substitute cheaper medicines for officinal ones; and illustrated several common instances where this is done.

A short discussion followed.

A vote of thanks was passed to the author, and the members adjourned.

BRADFORD CHEMISTS' ASSOCIATION.

The Annual Meeting was held at the Freemasons' Rooms, Salem Street, on Tuesday evening, January 24th; Mr. M. Rogerson, the President, in the chair.

The Secretary, Mr. H. G. Rogerson, gave the Report:—

"The present meeting signalizes the close of the second year of the Society's existence, a year which, though not one of marked activity, can nevertheless scarcely be said to have been barren of desirable results. The roll of the Society's members shows, unfortunately, a decrease in their numbers, four having resigned, and there being no counterbalance to their loss in newly-acquired members. That of the Associates, from removal from town and other inevitable causes, gives a defection as compared with last year of thirteen, but the accession of nine new Associates goes far to compensate for their loss.

"The Preliminary Examination of the Pharmaceutical Society has been passed by five of the students, the Modified by two, and the Minor and Major each by one.

"During the year a course of lectures on botany was delivered by Mr. Louis Miall, the attendance at which, though at first satisfactory, fell off materially before the termination of the series.

"The Council determined in October last to discontinue the employment of a *special* lecturer on chemistry, and to lighten their expenditure by transferring the students to the chemistry class of the Philosophical Society, a course upon which they may be congratulated, since from some influence or other the number attending that class has dwindled down to eleven.

"In April last the Society was instrumental in recording the objections held by the chemists of Bradford, in common with those of most other towns, against the regulations for the storing of poisons then proposed to be submitted for the sanction of the Legislature.

"A sum of £16. 7*s.* 6*d.* was subscribed through the Society's agency in October last for the relief of the sick and wounded in war.

"Dr. Parkinson was the Society's delegate at the recent Pharmaceutical Conference,—Mr. Rimmington, nominated as his colleague, being unable to attend that assembly.

"It is hoped that the present year may witness a larger attendance at the general meetings than heretofore, there being many manifest advantages, apart from the actual transaction of business, in frequent gatherings of members of the trade. For may not such meetings tend to smooth down prejudices, and prove a potent means of causing sentiments of friendship and brotherhood to supersede the feelings of petty rivalry that undeniably have too often had a cherished existence."

The Report having been adopted, the following officers of the Society were elected:—*President:* Mr. F. M. Rimmington. *Vice-President:* Mr. Joseph Hick. *Treasurer:* Mr. Thomas Harrison. *Secretary:* Mr. W. Newsholme *Council:* Messrs. Bell, Cockshot, Parkinson, Ph.D. Whitehouse.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Eighth Meeting of the Session was held in Anderson's University, on Wednesday evening last, the 25th January; Mr. T. Davison, President, in the chair. The large hall was filled in every part.

Messrs. Thomas Hart (Govan), John Dunlop, W. Halley, A. Miller, and M'Donald were elected members.

Mr. J. Fergus Wilson afterwards brought forward the motion of which he had previously given notice, on "Early Closing."

Mr. Fairlie seconded the motion, on the condition that the appointment of the committee be postponed till after the festival, which was unanimously agreed to.

Dr. Moffatt made some remarks on the properties and uses of the new antiseptic, "Chlor-alum," which were highly appreciated by the members.

Mr. W. Crocket was appointed Treasurer in room of Mr. Cassells, who has been obliged to leave the city.

The discussion on the proposed poison regulations, which was adjourned at last meeting, was then proceeded with.

The President read a copy of a letter he had sent to the Medical Department of the Privy Council, with the reply from Mr. Simon, of which the following are copies:—

"71, *St. Vincent Street, Glasgow*,
"16*th January*, 1871.

"Sir,—As President of the Glasgow Chemists and Druggists' Association, permit me to direct the attention of the Right Hon. the Lords of her Majesty's Privy Council as to the keeping, dispensing and selling poisons.

"Glasgow, with a population of over 500,000 inhabitants, has about sixty pharmaceutical chemists and chemists and druggists, and about 120 physicians and surgeons, who keep open shop for the retailing, dispensing, and compounding of poisons.

"The proposed regulations for the keeping of poisons will *only* apply to the sixty pharmaceutical chemists and chemists and druggists, the 120 physicians and surgeons who keep open shop being exempt from the operation of the Pharmacy Act, 1868, by the Amended Act, 11th August, 1869.

"As the regulations for keeping, dispensing, and selling of poisons are required for the protection of the public, may I hereby suggest that the Right Hon. the Lords of her Majesty's Privy Council co-operate with the Council of the Pharmaceutical Society, and obtain a Bill that will *include* under the Pharmacy Act physicians, surgeons, hospital infirmaries, dispensaries, and *all* who keep open shop for the selling, dispensing and compounding of poisons.

"The opposition to compulsory regulations by chemists and druggists throughout the country is almost entirely owing to the liberty granted to physicians, etc., who keep open shop to act as they think proper.

"I am, Sir,
"Your obedient servant,
"Thomas Davison.

"John Simon, Esq., F.R.S., D.C.L.,
"*Medical Department, Privy Council Office*,
"8, *Richmond Terrace, Whitehall, S.W.*"

(Reply):—

"Medical Department of the Privy Council Office,
"*January 24th*, 1871.

"Sir,

"I am directed by the Lords of her Majesty's Council to acknowledge the receipt of your letter suggesting the propriety of extending the operation of the Pharmacy Act, so far as concerns regulations to be made under it as to the keeping, selling, etc. of poisons to physicians, surgeons and others, who keep open shop for the sale and dispensing of poisons.

"My Lords direct me to say that should an opportunity occur for such legislation as you propose, your suggestion shall have the most careful consideration.

"I am, Sir,
"Your obedient Servant,
"John Simon.

"T. Davison, Esq.
"71, St. Vincent Street,
"Glasgow."

The President, after reading the letters, said he would leave it to the members to decide what further steps should be taken.

Mr. John M'Millan said he thought from the tone of Mr. Simon's reply, the Privy Council were not going to be so pressing in their demands for regulations as was at first anticipated; he thought it was a few of the members of the Pharmaceutical Society who were anxious that some action should be taken in the matter, but he said it was unjust to make the regulations compulsory upon chemists who, in the great majority of cases, gave their whole attention to business, while physicians and others who had shops, and who gave little or no attention to the dispensing part of their business, should be entirely exempt. It had always been his opinion that surgeons who had shops would be exempt from the regulations, although some chemists maintained the contrary, and the fact that no reference was made to that point in Mr. Simon's letter, he thought confirmed his opinions. He would advocate that the regulations in their present form be opposed.

Mr. Kermath said he looked upon the whole affair as a good farce. How were the regulations to be made compulsory? There has been no mention of how they were to be enforced, whether by the aid of inspectors, or if that duty was to devolve upon the local secretaries; and further, was there to be a punishment or fine put upon those who did not comply with them? These are things which ought to be inquired into, and until they were satisfactorily cleared up, all compulsory regulations opposed. For his own part he took every precaution, having Silverlock's label attached to every poison in his establishment, and he kept the more dangerous poisons at the back of other bottles on a high shelf where it was impossible for an assistant to reach them without knowing what he was about; and from what he had seen among the chemists of Scotland, there was far more care taken with poisons by them, than by many physicians who had shops, and who left them from day to day in the hands of youths or girls.

Mr. Paterson said he thought the regulations should be opposed in their present form, but the memorial should be got up in a different manner from the one sent up to the Council last year. He thought it did not receive the attention it would have got had it emanated from the whole trade instead of from the Association only; he therefore suggested that if a memorial be drawn up, an opportunity be given to all chemists in and around Glasgow to sign it for themselves.

After several other members had expressed their opinion, Mr. J. M. Fairlie (Hon. Secretary) moved "That a committee be appointed to draw up a strong memorial against the regulations in their present form, together with a statement of objections, to be presented to the Council of the Pharmaceutical Society at their Annual Meeting in May next, and that an opportunity be given to all chemists wishing to sign the memorial before that time."

Mr. Fairlie said that the great argument in favour of the regulations was, that they were for the protection of the public; but if so, why are chemists and druggists *only* required to adopt them? Some say, "Why do chemists wish to interfere with medical men? We have nothing to do with them; we have only to regulate our own affairs." This is all very true; I do not think there is a druggist in the kingdom who would interfere with a medical man in the performance of his professional duties; what we want is that when a medical man becomes a druggist, when he opens a shop for the sale and compounding of drugs, that he shall be under the same restrictions as ourselves. There is no unbiassed medical practitioner who keeps open shop that could object to being put upon the same footing, in this respect, as the druggist; and it seems to me to be the fault of the Council of the Pharmaceutical Society that they have not asked the co-operation of the medical department of Her Majesty's Council to get the regulations made so as to put all who keep open shop for the dispensing of medicines in the same position. Mr. Simon's reply says, that "should an opportunity occur," etc. I think we ought to do all we can to put the opportunity in their way, by getting the regulations rejected in May next. There are to be no voting-papers allowed; but if every association or every town in the kingdom would endeavour to send up one or two members, there would be no doubt the *Lancet's* hope, that we should be in a minority, would be reversed. The responsibility will then lie with the Privy Council, or probably with Parliament itself, and there is no doubt but that we shall receive every justice at the hands of the representatives of the people.

Mr. J. F. Wilson asked if medical men who had shops would be allowed to sign the memorial, as he was sure that the medical gentlemen whom he believed he represented would gladly do so.

The President stated there could be no objection to him signing it as a druggist, as the memorial was expected to come from druggists only.

Mr. M'Millan seconded the motion, which was unanimously agreed to, and an influential committee afterwards appointed to carry it out.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting of Executive Committee.

February 1st, 1871.

Distribution of the Year-Book for 1870.—The Secretaries reported that early copies of the Year-Book had been sent for review to the Pharmaceutical Journal and *Chemist and Druggist* on the 12th of January, and that since that date books had been issued to members as fast as parcels had come in from the binders. The whole of the edition (2000) had not yet been received, the printers expressing their "regret that the volumes had not been completed more rapidly;" sufficient, however, had come to hand to enable the secretaries to post the last batch of orders for delivery to the publishers on January 31st. The local secretaries of the Conference had kindly undertaken to deliver members' copies in the respective towns and districts, and the London wholesale houses had courteously accepted secretaries' parcels for enclosure; still delay on the part of the binders, and the difficulty of getting in all the subscriptions, had caused much inconvenience. The Secretaries were instructed to make direct application for subscriptions in September this year and in future, and to take steps for obtaining an increased number of members, with the especial object of securing sufficient funds to admit of the next annual volume being sent post-free direct to every subscriber.

A Year-Book for 1871.—The Secretaries stated that the financial position of the Conference was such as to warrant the executive in providing for the production of a Year-Book for 1871. A resolution was thereupon proposed by Mr. Carteighe, seconded by Mr. Williams, and carried,—

"That the Committee of Publication be instructed to make arrangements for the issue of a Year-Book of Pharmacy for 1871."

Appointment of Editor.—Three applications for the Editorship having been read, and ballots taken, the Chairman announced that Mr. C. H. Wood was the successful candidate. The following resolution was passed:—

"That Mr. Charles H. Wood, F.C.S., be now elected Editor of the Year-Book of Pharmacy. That the manuscript of the Year-Book be placed in the hands of the Committee on or before July 31st, 1871."

Presentation Copies of the Year-Book.—Daniel Hanbury, F.R.S., and Professor Attfield were appointed a Sub-Committee to revise the list of persons, presented with gratis copies of the publications of the Conference.

Recognition of the Labours of Mr. Joseph Ince, Vice-President of the Conference.—Proposed by Mr. Hanbury, seconded by Mr. Matthews, and carried unanimously,—

"That the cordial thanks of the Executive Committee of the British Pharmaceutical Conference be conveyed to Mr. Joseph Ince for his valuable services in editing, at a very brief notice and at much personal inconvenience, the Year-Book of Pharmacy for 1870."

Election of Members.—Several new members were elected, a list of whom will be given next week.

Candidates for Membership.—Gentlemen sending in their names to the London Secretary, Professor Attfield, 17, Bloomsbury Square, W.C., and enclosing the subscription, 5*s.*, and 7½*d.* for postage (in stamps, or Post-Office Order, payable to John Attfield at the Bloomsbury Office), will receive by return of post a copy of the Year-Book.

ROYAL INSTITUTION.

On Friday evening, January 20, Professor Tyndall delivered a lecture at the Royal Institution upon the "Scattering of Light," which was, in point of fact, a discourse upon domestic water supply. The Professor commenced by exhibiting the impurities of London air, the motes of a sunbeam, by the light of the electric lamp, and explained to his audience that what they saw was not air, but suspended particles, capable of being dissipated or removed, and that, when so removed, the track of the beam through the air itself would be invisible. He next related that he had accompanied the eclipse expedition to Oran, and that on his return, having been disappointed as regards the special object of his journey, he had sought to turn his opportunities to account by investigating the causes of the varying tints presented by sea water. After paying a warm tribute to the zeal and kindliness with which his wishes had been furthered by the captain and officers of Her Majesty's ship 'Urgent,' he described the way in which a series of nineteen bottles had been filled between Gibraltar and Spithead, and the results of an examination of them by the electric light. The bottles were themselves on the table, but were not placed in the beam before the audience, since the original differences among them had been diminished by subsidence. The general tendency of the examination was to show that the yellowish water of coasts and harbours held in suspension a large quantity of particles; that the particles in the green water were less abundant and in finer division; and that the blue water of the deep ocean was comparatively free. Professor Tyndall explained the blue or even blue-black of the depths, by displaying the prismatic spectrum on the screen, and by quenching it, at first partially and with regard to certain colours, and afterwards absolutely, by a succession of cells of increasing thickness, containing a solution of permanganate of potash, or of sulphate of copper. He said that when a beam of light entered the sea, the heat rays were absorbed by the surface, the red rays by a very superficial layer of water, the green rays next, and ultimately the blue. If, however, the light encountered particles, these would reflect the green rays to an observer; while, in the absence of particles, the green rays would continue their course till they were wholly quenched. Water of great depth and absolute purity would thus appear entirely black, like a sea of ink, and would reflect no light beyond a glimmer from its surface. The Professor exhibited a white dinner-plate, to which a rope was attached, and which he was in the habit of having cast overboard and towed from the 'Urgent,' and which always appeared green, and he also described the appearances seen on looking down the screw-well of the ship, where the water was seen by turns green—with the screw-blades as a background—and then dark blue, with the ocean depths for a background. The white plate, which appeared as a green object when towed under water, would, he said, if ground to powder and scattered cause the portion in which this powder was suspended to return a general green reflection. Having in this way established that the visibility of the track of a beam through water depended upon particles by which the light was reflected, Professor Tyndall next placed before the electric lamp a succession of nine bottles, containing samples of the water supplied to their customers by the various London water companies. The turbidity revealed was in every case sufficient to make the audience regard water as a very undesirable beverage. That of the Lambeth Company displayed pre-eminence of a bad kind; that of the Kent Company was by far the clearest; the West Middlesex Company stood second in order of merit, and among the rest there was little to choose. With a reticence more eloquent than words, the lecturer avoided expressing opinions about the dirt that he exhibited; and he also expressly mentioned that pellucidity was no proof of the absence of soluble impurities. He also showed that to cleanse water from suspended dirt was a very difficult matter; and exhibited four specimens of distilled water, a specimen once filtered by Mr. Lipscombe, a specimen that had gone through a silicated carbon filter, and a specimen four times filtered through bibulous paper in the Royal Institution Laboratory. These were clear when compared with the water of the companies, but the track of the beam was plainly visible in all. A specimen of water from the Lake of Geneva was then exhibited in illustration of great natural purity, and here a faint blue line only could be seen. This brought Professor Tyndall to the practical conclusion at which he had been aiming, namely, to an account of the water supply yielded by the English chalk formations. He characterized this as being of the greatest attainable purity, inexhaustible in quantity, and easily accessible for the supply of the Metropolis. He described its natural hardness as being such as to render it unfit for domestic use, but explained that by Clark's process this hardness could be entirely removed at the central works, and that the water might be delivered in London at a uniform temperature, free from organic impurity or suspended particles, and so soft as to be perfectly adapted for all household purposes. He described Clark's process, and illustrated it before the audience, and finally showed actual results by producing a bottle of water from Canterbury, derived from the chalk, and softened in the manner described. By the side of this was a similar bottle containing the water supplied to the Institution, and the two were illuminated together by way of contrast. The difference was like that between pea-soup and crystal. Professor Tyndall then read a portion of the report made some years ago by the late Professors Graham and Miller, and by Professor Hofmann, upon the admirable qualities of this chalk-water, when artificially softened, upon its fitness for the supply of the Metropolis, and upon the impolicy of allowing it to pass into private hands, and concluded by saying that every word that he had read he desired fully and cordially to endorse.—*Times.*

PHILADELPHIA COLLEGE OF PHARMACY.

A special meeting of the College was held on Monday, Dec. 5, to receive the report of the Committee appointed to consider the business interests of the *American Journal of Pharmacy.* The following recommendations of the Committee were, after consideration, adopted (1) That the business pertaining to the journal shall be transacted at the College building; (2) that the journal shall be published monthly; (3) that a business editor be appointed to attend to the advertisements, the distribution and the accounts; and (4) that the treasurer of the publishing committee be authorized to draw on the treasurer of the College for the prime cost of the journals supplied to members.

On Tuesday, Dec. 27, the ordinary meeting of the College was held. The following communication was read:—

TO THE PHILADELPHIA COLLEGE OF PHARMACY.

Fellow Members,—It is now thirty-four years since my connection with the *American Journal of Pharmacy* as a contributor commenced, and about twenty-five years as co-editor and editor.

During this period time and labour have been freely given to make the work a continuous record of the progress of pharmacy at home and abroad. For many years it was a labour of love, and despite the great sacrifice of time occasioned by contributing to its pages, the labour was cheerfully given. Of latter years a change has occurred in this respect: the work has been continued regularly as a matter of duty, but it has ceased to be a pleasure. Under these circumstances, I desire to carry out an intention entertained for several years, and withdraw from the editorship.

In order to give the College time to select a successor, I have deemed it best to offer this my resignation at this meeting, to take effect at the annual meeting in March, when the stated time for electing an editor arrives.

Meanwhile every effort will be made to introduce the new order of things adopted at the special meeting of the present month, and to start the journal as a monthly in its three first numbers, hoping that the College will then be ready to release me from further duty.

I need hardly say that it has required some effort on my part to thus voluntarily resign a position fraught with so many pleasant memories, and which has brought me in contact with a large number of professional brethren beyond the pale of our College, yet after deliberate consideration I believe duty to myself requires the step to be taken, not doubting that under the auspices of a new editor the Publishing Committee will be able to report a flourishing condition of the journal at the end of the coming year.

Respectfully,

December 27th, 1870. WILLIAM PROCTOR, Jun.

The resignation of Mr. Proctor caused great regret among the members. A Committee was appointed to report to the next meeting the name of a suitable person to succeed him in the office of editor.

Frames for the engraving of Jacob Bell and the photograph of the Plough Court Laboratory, received from Mr. Daniel Hanbury, were presented by Mr. W. Procter, jun.

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"The First Principles of Biology" (Educational Course). By Prof. Huxley.

TUESDAY ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.

WEDNESDAY ...*Society of Arts*, at 8 P.M.—"Ornamentation considered as a 'High Art.'" By Dr. Christopher Dresser.
Microscopical Society, at 8 P.M.

THURSDAY......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." By Professor Odling.
London Institution, at 7.30 P.M.—"The Action, Nature and Detection of Poisons." By F. S. Barff.
London Chemists' Association, at 9.30 P.M.—"Remarks on Structural Botany." By J. H. Jessop.

FRIDAY ....*Royal Institution*, at 9 P.M.—"Fallacies connected with Ships and Guns." By E. J. Reed.
Quekett Club, at 8 P.M.

SATURDAY......*Royal Botanic Society*, at 3.45 P.M.

The following journals have been received:—The 'British Medical Journal,' Jan. 28; the 'Medical Times and Gazette,' Jan. 28; the 'Lancet,' Jan. 28; the 'Medical Press and Circular,' Feb. 1; 'Nature,' Jan. 26; the 'Chemical News,' Jan. 27; 'Journal of the Society of Arts,' Jan. 26; 'Gardeners' Chronicle,' Jan. 28; the 'Grocer,' Jan. 28; the 'Produce Markets Review,' Jan. 28; the 'English Mechanic,' Jan. 27; the 'American Journal of Pharmacy' for January; the 'Western Gazette,' Jan. 27; the 'Macclesfield Courier,' Jan. 28.

Parliamentary and Law Proceedings.

THE BETTS SUITS.

LORD CHANCELLOR'S COURT, 30*th January*, 1871.

Betts *v.* Willmott.

This was an appeal by the plaintiff against a decree dismissing his bill with costs, made by the Vice-Chancellor James, on the 28th June, 1870, reported in the PHARMACEUTICAL JOURNAL, 3rd series, Vol. I. p. 32.

The plaintiff had, by an order of the Lord Chancellor dated 3rd August, 1870, become bound in the suits *Betts* v. *Potts*, v. *Cleaver*, v. *Field*, v. *Brooks*, v. *Foster*, v. *Pratt*, v. *Stevenson*, v. *Smith*, v. *Hall*, v. *Hart*, v. *Ellis*, v. *Warin*, v. *Cooper* and v. *Preston* to abide the result of the appeal in *Betts* v. *Willmott*.

Mr. Willcock, Q.C., Mr. Grove, Q.C., and Mr. Everitt appeared in support of the appeal—Mr. Kay, Q.C., Mr. Eddis, Q.C., and Mr. Langley, for the respondent.

The LORD CHANCELLOR, at the close of the appellant's case, and without calling upon the respondent's counsel, delivered judgment.

Mr. Kay, I think, not having heard you, the case has been established by Mr. Betts, upon whom the *onus* is thrown, that you are making an indirect use of his invention, but he is bound to prove two things, one of which, it appears to me (not having heard your argument upon it), he has proved, namely, that there is a use of his invention. But the question is, whether it is an unauthorized use. It appears to me, the *onus* being thrown on Mr. Betts to prove that he has not discharged himself of it, he has to show that this thing you are using is not manufactured by him. That he attempted to do, in the first instance, by an affidavit in which he says it has not his private mark.

Mr. Kay.—He does not even swear that, my Lord.

The Lord Chancellor.—I took that rather from the Vice-Chancellor's judgment. Therefore he says, *primá facie*, "I did not make this," but what turns out upon cross-examination is this. He says, when cross-examined, that he is not only the manufacturer of this article in England, but that it is manufactured abroad by him in two different manufactories. It appears he bought up, at Paris, a business where the article was manufactured in the name of Espinasse, and he continued afterwards to carry on the business there, through the medium of Espinasse, who was acting as his paid agent, and therefore, for all purposes, Espinasse is the plaintiff in the suit. Being cross-examined further as to what is the actual condition of the thing so manufactured by him, and having made the admission that there is a manufacture of this article in Paris, he thus continues in his cross-examination, "I cannot answer whether the capsules A. B. and C., mentioned in the same affidavit, are or have ever been in my possession. If they are, my solicitor has them. I cannot now produce the Exhibit numbered 210. The eleven bottles now produced and marked as Exhibits 263, 201," (and a number of others) "are the several bottles I rely on in eleven of my several suits. I don't know whether the Exhibit No. 210, did or not correspond, in external appearance, with these eleven. The exhibits numbered 204 and 207 being infringements, I have no doubt No. 210 did correspond, in external appearance, with them, but I cannot compare them with a thing which is not present. After examining the capsules on the eleven Exhibits, and those on the Exhibits numbered respectively 211 and 401, I cannot say by whom those capsules were manufactured." Then he is asked, "Will you pledge your oath whether those capsules were or not manufactured by your house of Espinasse?" Answer, "I believe they are infringements, and that they are not of the house of Espinasse. I found this my belief on this, that Rimmel's dies, in Paris, do not correspond, as I have been informed, with the stampings on those, but I will not swear that they do not correspond exactly." Then a little lower down he says this, "I do not know whether it is the fact that Dupré's capsules supplied to Rimmel bore Dupré's name upon them," and at line 52, he says, "I will not swear that each of the capsules on the eleven Exhibits, and on those numbered 211 and 401, was not made by my house of Espinasse, or that they were not sold and delivered by that house to Eugene Rimmel." That is the part which, to my mind, creates the great difficulty in the plaintiff's case. Unluckily 210 itself has been lost, but we cannot help that, and we cannot, therefore, deal with that specially. He will not pledge himself to say that there is any real distinction between 210 and the others which are exhibited. As to those others which are made Exhibits, he says, "I have sworn that they were not manufactured by me, but I will not take upon myself to say that they were not manufactured by my house in Paris, or were not sold by that house to Rimmel."

That being so, the onus, I apprehend, being on the plaintiff to show that not merely is the thing made his own patented article, but that it has been unlawfully sold, he must be prepared to swear distinctly that it is not manufactured by him or his agents. Take this case. Supposing he had three houses of manufacture,—one in the north of England, one in the west of England, and one in London. I apprehend it would be his duty in making out his case before a jury to come forward and prove not only by his London agent that the article was of the same description as the patented article, but he would have to show it was not made by himself; and, for that purpose, he would have to call persons who had the control of his house in the north, also of his house in London, and also of his house in the west, to prove that no such articles were made by them. As things of a similar description are sold by millions, and are sold for the purpose of being distributed in every shop throughout the whole length and breadth of the land, it would be extremely improbable—not impossible, but a matter of considerable difficulty—for the persons who, from time to time, purchased not the capsules themselves but the bottles covered with the capsules, not being buyers of capsules wholesale, but purchasers as part of their stock in trade of a variety of bottles at a time, sometimes one bottle of one article, and sometimes twenty bottles of another article,—it would be impossible for them to go round to the whole trade and trace these bottles through the variety of persons into whose possession they might have got, in order to show that they could be traced up to the plaintiff's manufactory, without the Court in the least requiring it in the first instance; there should be the plaintiff's oath. If he takes that oath, and throws the onus on the defendants, they must meet it as best they may, but the oath of the plaintiff would be required to show that he had not manufactured that thing which had got into the hands of the particular defendant who is brought before the Court. This plaintiff discharged that duty in the first instance by saying, "I did not manufacture that particular thing;" but on cross-examination he says, "when I made that affidavit I did not intend to describe it in that way as not having come out of my manufactory in France, and I will not swear that now." The Vice-Chancellor's observations are certainly somewhat strong upon this gentleman, and I do not know quite that I should myself make the same strong observations, because the gentleman may possibly have had in his mind that view of the law which has been submitted by his counsel; and I quite agree with Mr. Grove that an argument might have been presented on that point, although I do not remember such a point having been brought before the Court before, or that the circumstances ever occurred which could give rise to such an argument; the point is this—supposing a man to have a patent in France and a patent in Belgium and a patent in England, and he establishes manufactories in each place for the manufacture of his patented article, then it is said that if he sells the patented article in France, it is for the French market, and it does not justify a person buying the article in France and bringing it over to England, and he cannot be allowed to use that article so made in France in England. Then Mr. Grove put the case of his having assigned his English patent (sold it to somebody), and continuing the manufacture in France, and said, would not the importer of any article sold in France come within the doctrine of *Caldwell* v. *Vanvlissingen?*

No doubt in the case so put he would, because the licence to sell, which vested originally in the patentee, would then be vested in his assignee, and therefore no licence in England given by the original patentee after a sale could authorize the making of the article; so of course, in exactly the same way, no sale at all by the original patentee in France, who is also the original patentee in England, could defeat the rights of the original patentee in England, or defeat the rights of a person purchasing from him in France. In other words, it comes almost within the doctrine of leave and licence, and leave and licence would not be effectual in such a case; and is it any more effectual in the other case, where a man carries on the three manufactories himself, and himself disposes of the article abroad? I apprehend if he disposes of the article abroad, unless it can be shown, not that there is some clear injunction to his agents or the like, but that there is some clear communication to the party to whom the article is sold, the person who has the sole right of vending in England, if he chooses to sell the goods in France, or Belgium, or England, or in any other quarter of the globe, the persons who purchase of him transfers with the goods necessarily the licence to use the goods which he has so sold. When a man has purchased an article he intends to have the control of it, and there must be some clear and explicit agreement to the contrary proved as against the purchaser of the article to justify the vendor in saying, I have not given you my licence for the sale of the article. He cannot prevent the purchaser using it wherever he pleases as against the person with regard to whom he is entitled to use it. He cannot use it against his assignee without a previous assignment of the patent, because no previous assignment of the patent would confer that right; but he can use it against the person who himself is the owner and proprietor, and has the power of conferring a complete right on him by the sale of the article. If this gentleman is unable to show that these things which he charges the defendant with having used are not used unlawfully,—if he cannot show that to be the case, I apprehend that, without establishing that he has not himself sold the very article the use of which he now seeks to prohibit, he cannot succeed by way of injunction in this Court any more than he would in an action at law. Therefore on that ground, although I do not quite follow the reasoning of the Vice-Chancellor on the subject, the decision being right, the petition of appeal will have to be dismissed with costs.

Deaths Supposed to Result from Excessive Doses of Chloral Hydrate.

An inquest has been held at South Petherton to inquire into the circumstances attending the death of Mrs. Masters, the wife of the Rev. J. P. Masters.

It appeared from the evidence that the deceased had for seven years suffered from violent hysterical attacks, for which she had at one time been recommended the use of stimulants. In consequence, however, of their effect upon her, under the advice of Dr. Norris these had been given up, and that gentleman prescribed for her draughts containing 30 to 40 grains of chloral. This offended Mrs. Masters very much, and eventually she went to consult Mr. Sanders, chemist, of Ilminster.

In his evidence Mr. Sanders said he was asked by Mr. Masters to prescribe for deceased when she would not take the draughts which Mr. Norris sent her. He did so, and, knowing of a similar case at Ilminster, in which chloral was used by Dr. Mules with success, put up draughts for her, containing 30 to 36 grains of that medicine. He had been told by Mr. Masters that she could not bear any preparation of opium. He had made up these draughts within the last two or three months. He had put up, perhaps, four-and-twenty. He understood that deceased did not take these draughts at the same time that she was taking those of Dr. Norris.

Occasionally deceased would take Mr. Sanders's draughts in the morning instead of at night. As she became very fond of the draughts, they were carefully guarded. This greatly excited her, and she insisted upon having them, and occasionally would take one of Mr. Sanders's draughts after taking one of Dr. Norris's. On Tuesday, the 8th January, upon going to bed she took one of Dr. Norris's draughts. About midnight she awoke, and asked for another. At first it was refused, but she became so violent that it was given to pacify her. She afterwards had a third, which caused sickness, and a fourth. On Wednesday she had three more, followed by much sickness; and on the Thursday morning, her husband, having left her for a short time, found her dead upon his return. As Dr. Norris said that he could not state positively the cause of death, a *post-mortem* examination was ordered.

Upon the resumption of the inquiry, Dr. Norris read a report of an analysis of the stomach and other portions of the body, made by Mr. Stoddart, chemist, of Bristol. Mr. Stoddart commented on the fact that decomposition had not taken place, although more than a week had elapsed since death. This he attributed to the effects of chloroform, a small quantity of which he found in the tissues. Dr. Norris said he commenced giving Mrs. Masters chloral in the summer of 1870, after ascertaining that various other sedatives did not suit her. The draughts he gave consisted of 40 grains. He had administered chloral extensively for two years past. If sufficient time was allowed for it to pass off it could not do any harm, as it did not remain in the system. On Monday, 9th instant, he sent Mrs. Masters a mixture of six doses, each dose of which contained 10 grains of chloral. If given in small quantities, chloral eased pain but did not induce sleep. According to the evidence given by Mr. Masters, deceased had taken 260 grains of chloral within thirty-five hours of her death, 112 grains of which had been administered within twelve hours of death. His opinion was that on the nights of January 10th and 11th she must have taken excessive doses of chloral, which prevented any chance of rallying from the prostrating effects of excessive vomiting on the morning of her decease, and probably produced syncope, from which he believed deceased died.

The jury, after a long consultation, returned a verdict, "That the deceased died from syncope produced by excessive vomiting, of the cause of which there is not sufficient evidence to satisfy the jury."—*The Western Gazette.*

On Monday last an inquest was held at Whittlebury, Northamptonshire, to inquire into the death of the Rev. L. Froome, rector of that village. The deceased had gone to bed on the previous Thursday evening apparently in good health and spirits, and on the following morning had been found dead in his bed. He had been accustomed for some time past to take opiates in consequence of suffering from sleeplessness. Latterly he had used chloral hydrate. It appeared from the evidence that he had taken an overdose of this drug, which had resulted in his death. The jury returned a verdict, "That the deceased came by his death by inadvertently taking too large a dose of a medicine called chloral hydrate.—*Times.*

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[72.]—COUGH BALSAM.

℞. Morphiæ Mur. gr. xij
Sp. Æther. Nit. ℥ij
Tr. Opii Camph. ℥viij
Vin. Antim. Tart. ℥ij
Sp. Ammon. Co. ℥viij
Syr. Papav. Alb. ℥xij
Oxymel. Scillæ ℥iv
Vin. Ipecac. ℥ij
Aq. Puræ 46 oz.
Extract. Belladonnæ, gr. 45.

M. Adult dose ʒij ex aqua. DELTA.

[114.]—ARECA-NUT TOOTH-PASTE.

℞. Prepared Charcoal ℥j
Prepared Chalk ℥iij
Areca-Nut Powder ʒj
Honey, q. s.
Otto of Rose ♏xx
Oil Neroli ♏xxx
Ess. Ambergris ♏x
Oil Rose Geranium ♏x.

M. DELTA.

[128.]—AMANDINE.—In answer to *J. P.* the following recipe for amandine is furnished by "*Rusticus*:"—

Bitter Almonds (blanched), 4 oz.

Beat them in a mortar, with a small quantity of water, to a smooth paste and add—

Orris Root, in fine powder,
Soap, in fine powder, each 1 oz.
Glycerole of Starch, 2 oz.
Clarified Honey, 1 oz.
Oil of Bitter Almonds, 5 drops
Oil of Lavender, ½ fl. drm.
Oil of Bergamot, 1 fl. drm.
Tincture of Cochineal, *q. s.* to colour.

Mix.

Blanch 12 oz. of bitter almonds and beat them in a mortar with a small quantity of rose or other water to a smooth paste; then add 7 oz. of rice flour, 3 oz. of bean flour, 1 oz. of orris powder, and when perfectly mixed, ½ oz. of carbonate of potash, dissolved in rose water; again beat together and add 3 oz. of spirituous essence of jessamine, 2 drops of oil of rhodium and one of neroli.—BEASLEY.

Take of Fine Pale Honey (or strong syrup) 4 oz.
White Soft Soap made from Lard and Potash, 2 oz.

Mix them thoroughly in a Wedgwood mortar, adding, if necessary, two or three teaspoonfuls of solution of potash, so as to produce a thoroughly homogeneous paste.

To this add and rub in by degrees and very gradually,—

Oil of Almonds 3½ lbs.
Previously mixed and scented with
Essential Oil of Almonds,
Essence of Bergamot, of each, 3 drms.
Oil of Cloves,
Balsam of Peru, of each, 1½ drm.,

and continue the trituration until the whole assumes the appearance of a rich transparent jelly. Finally, put the paste into pots or wide-mouthed bottles.

[*Note.*—The balsam ought to be triturated with a little of the almond oil, warm, before adding it to the rest, and after all the scents are added, the oil should be allowed to settle for two or three days and the clear portion only used.]

In using, a lump of amandine the size of a large pea is rubbed with a few drops of warm water, and the rich white lather applied to the hands, face, neck, etc. In a short time the skin may be wiped with a soft napkin.

Amandine may be *glycerinated* by adding one ounce of the best glycerine for every pound of oil to be used.

[132.]—COUGH BALLS FOR HORSES.

℞. Gum. Ammoniaci ℥viij
Pulv. Scillæ ℥ivss
Gum. Opii ℥ij ʒij
Gum. Camphoræ ℥ivss
Potassi Nitratis ℥vij.

M. Glob. ℥j ʒij ana. DELTA.

[134.]—BEESWAX.—The ordinary process for refining crude beeswax is to melt the wax with about five per cent. of water in a bright copper or stoneware boiler. When the whole is perfectly liquid and has boiled for some minutes, oil of vitriol, in the proportion of five or six fluid ounces to every cwt. of wax, is sprinkled over the whole surface of the wax. Great care is required during this operation, as the wax froths up and will run over the sides of the vessel if not carefully watched. The wax is then covered over and left to settle until cool enough for moulding, when it is gently skimmed off with a hot ladle, care being taken not to disturb the sediment. When no more can be drawn off, the impurities (mostly bees) are scraped from its under side, and the scraped cake remelted and strained through canvas into a mould. When wax has a poor colour it is sometimes improved by dissolving a small quantity of roll annatto in the melted wax, according to the shade required.—COOLEY.

[137.]—HAIR DYE.—

No. 1.

℞. Arg. Nit. Cryst. ʒj
Gum. Acaciæ ʒj
Aq. Destil. ℥ij.

M. S. A.

No. 2.

Acid. Pyrogallic. gr. iv
Aq. Destil. ℥ij.

E. ASTIN.

The following is a good recipe for hair dye:—

No. 1 solution.

℞. Acid. Gallic. gr. x
Sp. Æther. Nit. ʒiss
Aq. Dest. ad ℥j

Dissolve the gallic acid in sp. æth. nit. and add the water.

No. 2 solution.

℞. Argent. Nit. Cryst. ʒss
Burnt Umber gr. ij
Liq. Vol. C.C. o. ℥ss.

M.

I have seen this used in several cases and answer well.—FREDERICK WARNEFORD.

[146.]—FLAVOURED CASTOR OIL.—Will any reader be kind enough to give me a good form for making orange- or lemon-flavoured castor-oil?—W. SMITH.

[147.]—OSTEO-STOPPING FOR TEETH.—"*Alveolus*" will feel obliged to any gentleman who can give him a formula for a good osteo-stopping for teeth.

[148.]—TEETH-STOPPING.—*T. M.* (Notts) wishes to be informed of a good and cheap formula for an amalgam for stopping teeth.

[149.]—FRANKINCENSE.—I have been asked for frankincense, described as being in dry chips, similar to, but darker than yellow sandal-wood. Can any of your readers kindly inform me what substance was intended?—N. H. M.

[150.]—WHITE FELT CORN PLAISTERS.—*M. P. S.* would be glad if any reader could give him the formula for the preparation used in making the above.

[151.]—LIME JUICE AND GLYCERINE.—*A. C.* would feel greatly obliged to any reader who would kindly give a recipe for making lime juice and glycerine for the hair.

[152.]—FUMIGATING PAPERS.—Will any correspondent kindly give us a recipe for making tobacco papers for fumigating purposes.—ENQUIRERS.

Correspondence.

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

Storage of Poisons.

Sir,—I am not surprised at the number of letters you continue to receive upon this subject, for it is one of the utmost importance, and our conduct in this matter will undoubtedly have very great influence upon our future status and welfare.

In the letter from the Medical Department of the Privy Council to the Registrar, there occurs this passage, "My Lords believe it to have been the opinion of Parliament that proper regulations in this matter are required for the protection of the public." These are serious and weighty words, and the whole tendency of modern legislation on matters connected with health being towards State supervision and control, there can be no doubt that before long some action will be taken in this matter, and it would be neither grateful nor wise of us to oppose it,—ungrateful because we have already received privileges in connection with this subject, and impolitic because our opposition would most assuredly be unsuccessful,—and, if compulsory enactments are to be made, it were surely better that they were framed by ourselves, acquainted with all the bearings and difficulties of the question, than to have an Act forced upon us by others comparatively ignorant of the subject.

And I would ask what are the special difficulties in the matter? What hardship can there possibly be in compelling the less careful to adopt those simple and necessary precautions which prudent pharmacists have already voluntarily established? To the skilful and careful they are no impediment, while to those who are not so, they act as a safeguard and check; even the occasional visit of an inspector, although to a certain extent unpleasant, can have no terrors for those who respect the law and carry out its provisions. Schools, workshops and factories are inspected, and any medical man who takes a lunatic patient into his house, is subjected to a monthly examination of his premises ten times more inquisitorial and unpleasant than any we shall have to endure.

After long and careful consideration of the subject, I am convinced that some compulsory regulations must be proposed by ourselves, or they will be forced upon us by the Government, and that, though there may be some difficulties, there will be also some advantages arising from State supervision and recognition.

In conclusion, I would suggest that the matter be put into the hands of a Committee of six or seven gentlemen, appointed by the Council or by a general meeting of the members convened for that purpose.

January, 1871. Frederick Andrews.

Sir,—Since the commencement of the correspondence on "The Storing of Poisons," we have been favoured with the views of many writers as to the merits and demerits of the proposed regulations, a very small majority being against compulsory legislation. Now, judging from the letters of this majority, it seems to me that their principal objection to the proposed movement is, because it is compulsory; they do not like the idea of being compelled to do now what they should have done voluntarily perhaps years ago, and strongly object to having any measure pushed down their throats as it were. I am glad to see some of your correspondents take an opposite view of the case; and one at least there is who speaks as emphatically in favour of the compulsory idea as any of the objectors do against it.

After reading this mass of correspondence, I do not feel my ideas particularly enlightened as to the demerits of regulations; and I remain much as before, impressed with the necessity, or rather desirability, of some such measure. I would suggest that it be left to the Council to recommend most strongly, and with all the force of their influence, the adoption of such a measure; and if afterwards this is found insufficient, then to make it compulsory; and when made compulsory on us, common-sense demands that it should be equally binding on dispensing surgeons, as it is in their surgeries that most of the accidents from careless dispensing take place. Indeed, so lately as the 20th of this month a case is reported in the *Liverpool Daily Courier*, where death resulted from the use of morphia instead of another drug, the medicine being compounded by a youth whose experience of the nature and properties of drugs was limited to a year and three-quarters; and had one of the precautions recommended by the Council been adopted, the child's life would in all probability have been saved. In these proposed regulations I see nothing to call forth such emphatic protests against their use. Were we tied down to any one of the three, the case would be different; but such a very wide latitude of choice is allowed, that I can hardly conceive anything but downright obstinacy refusing to adopt them. For my own part, I have used a similar plan for some years past without any inconvenience; for instance, tr. opii, ac. oxalic, with one or two others of a like class and in frequent use, are relegated to a part of the shop where there is no possibility of their being taken in mistake for others, being also marked "Poison." Atropia, strychnia and other powerful poisons are under lock and key; liq. arsenical., corrosive sublimate and arsenic occupy their usual places on the shelves, but securely capped, with a large red paper star, as well as "Poison," pasted on the bottles, so that there is no chance of danger in that quarter, while some are in octagonal and coloured bottles; so here are all three plans in use.

One consideration seems to have been lost sight of by all your correspondents. Were these regulations made on behalf of principals alone they might, to a greater extent, be thought unnecessary, as, from constant familiarity and the most moderate exercise of prudence, we are able, generally speaking, to avoid error; but most of us employ assistance in the conduct of business; some have apprentices and assistants constantly, and others as a temporary relief; and it is almost impossible that they will have the same familiarity with the arrangements of the shop, and the same prudential motives to guide them. To me it seems useless to say that the improved education of the druggist is the best safeguard; at present it is not, further than he himself is concerned. When all druggists and their assistants shall be examined pharmaceutical chemists, and when no apprentices or pupils are taken,—which, of course, is an absurdity,—then it may be. To a druggist who thinks he is being hoaxed when asked for "seed lac;" to another who confesses his ignorance as to ammonia alum, and, though he may see it daily, says he has none; and to another who advertises "oatmeal soap and all other French chemicals" (these have all come under my own notice recently),—such regulations may be needful. Taking into consideration the little inconvenience such a measure would be to ourselves,—nay, the convenience it would be, if taken in a right spirit,—and the satisfaction that would be afforded to the public mind, I intend to give it my hearty support.

T. H. Hustwick.

Liverpool, January 25th, 1871.

[*** We do not suppose our correspondent is singular in practising some such precautions as those he mentions; indeed, we should rather expect to find them adopted, according to circumstances, in all well-regulated establishments, and by all pharmacists who have received an education such as would ensure their competency and a due sense of their responsibilities.—Ed. Pharm. Journ.]

Sir,—I have read with pleasure the correspondence which has been going on in your columns for some time respecting the "compulsory" keeping of poisons. It is very creditable that it has been conducted in so fair a manner. Some of the letters have been very ably written, and all of them have shown that the writers are really in earnest. On calmly reviewing the correspondence, I think it must be confessed that the opponents of compulsion have the best of it; *cui bono*, I would ask? I cannot see that its advocates have yet advanced sufficient reason for compulsion. What are the facts? How many deaths have occurred through the carelessness of chemists during the last twelve months or during even the last twelve years? Of the few accidental poisonings which have occurred, the majority have been caused by medical men who dispense, or rather send out their own medicine. I cannot but think that the "protection of the public, like many other cries of the present day, has been pushed a little too far and become stale.

The general public have become so familiarized with that awful word "Poison," that already it has lost more than half its power as a caution. There never was a greater mistake than compelling us to mark "Poison" on such articles as paregoric, syr. poppies, infants' preservative, *et id genus omne.* The Committee of Pharmacy have attempted too much, and have defeated their object,—" the safety of the public." One is reminded of Shakspeare's

"Vaulting ambition, which overleaps itself,
And falls on t'other side."

Personally I am decidedly opposed to any compulsion whatever. We have quite enough with the patent medicine licence, spirit licence, methylated-spirit licence and petroleum licence without inviting a set of inspectors to visit us at unseasonable hours. I am vain enough to think that I can manage my own business without the intervention of the Council, and charitable enough to suppose that the great majority of my brethren can do the same. Few have been connected with the Society longer than I have; and no one has a greater respect for the Council, several of whom are personally known to me. I have always been taught to respect those who are "set in authority over us," and know the truth and value of what Mr. Bagnet says, viz. that "discipline must be maintained;" still there is a limit beyond which it would be unwise to proceed, and I would advise the Council to pause in time. Let them ascertain the real feeling of the members by sending out voting-papers to every Pharmaceutical Chemist in the kingdom. I shall be perfectly content to abide by the result, whatever it may be; but I do not feel inclined to put myself to considerable expense and much inconvenience at the simple dictation of the Council. I have hitherto been content to be a very silent member indeed, but it is the last strain, etc., and I think it behoves all who have an opinion on this subject, to boldly give expression to it before the annual meeting.

January 30*th*, 1871. SYDNEY TAYLOR.

Sir,—Is your correspondent, who shields himself in the obscurity of "*Opifex*," a *bonâ fide* chemist?

I am tempted to make this inquiry from the total want of respect and consideration he has shown for our brethren, charging "very many with carelessness in the way they carry on their business, and as very ill-qualified to conduct it rightly," and then sneering at our friend Mr. Vizer's analogy to the surgeon and his lancets, passing by his powerful arguments against poison regulations and fixing upon the weak point of his letter. I certainly regret Mr. Vizer did not apply a more forcible comparison; for instance, suppose the Council of the Royal College of Physicians, in concert with the Privy Council, proposed to make it imperative that every person who died under the treatment of a general practitioner should be subject to an inquest held by a medical tribunal,—the profession would to a man vehemently resist such a scandal upon their qualification.

"*Opifex*" speaks too of the amazement expressed by the medical journals at our opposition and the probability of our exciting the contempt of the House of Commons, and goes on to say if we continue to resist the proposed simple enactment "we shall be one of the curiosities of pharmaceutical literature," but what our opposition has to do with literature I cannot comprehend. I have conversed with many medical men upon this subject, and they have all expressed surprise that any chemist should be willing to place such a yoke upon his neck; and as to the House of Commons, it is all a phantom.

When the Council first introduced the subject, in Vol. XI. second series, No. 7, p. 377, there was no mention of the Privy Council nor House of Commons, who have more important duties than troubling themselves about poison cupboards.

I hope in future those who write upon this subject will subscribe their names, that we may know who would yoke us to their bondage, and those whom we may honour as the champions of our liberty. JOHN BEATON.

Kilburn, January 30*th*, 1871.

Sir,—The case reported in the PHARMACEUTICAL JOURNAL last week is worth notice, especially by one who shelters himself under the common-place signature *M. P. S.*

A Mr. Jones, chemist, druggist and stationer, of Mossley, Lancashire, sent for a medical man to attend his infant daughter. The medicine prescribed was compounded by a lad employed in the surgery, who substituted morphia for some other remedy. The first dose proved fatal. Surely, if educated and experienced pharmacists are to be coerced by law, subjected to the decisions of country magistrates or the tender mercies of common informers, other dispensers of medicine, whether in public or private establishments, should be included in the same regulations.

As regards blunders, inadvertencies and acts of carelessness, I am confident that they take place in our shops less frequently than elsewhere. Physicians themselves are not exempt from occasional errors, proof of which I have in my possession—several letters from eminent men thanking me for the judgment shown in dispensing prescriptions, which, had they been made up literally must have killed the patient. I write this after an experience of more than thirty years, and hope that *M. P. S.* will, before again addressing you, obtain a little more of that in which he acknowledges himself so deficient. R. GOODWIN MUMBRAY.

Richmond, S.W.

Sir,—It appears to me that the weak point in the proposed poison regulations is the fact that they apply to many comparatively mild preparations a system suited only for really dangerous articles. What can be more absurd than to place liq. ergotæ and tinct. canthar. under such stringent rules? How could crude opium or ergot possibly be mistaken for any other drug?

If the first regulation be applied to all poisons, and the second only to those which are really dangerous, I venture to think the difficulties of the subject might be met.

Jan. 30*th*, 1871. "PROVINCIAL."

CHLORAL HYDRATE.

Sir,—Messrs. E. De Haen and Co., of Hanover, justly complained, in a note you published last week, of certain statements in Mr. Mason's paper of January 7th, on chloral hydrate, which would make it appear that samples obtained by him as Messrs. De Haen's chloral hydrate were in reality chloral alcoholate.

Such statements, groundless and unjustifiable as they are, are calculated to do serious injury; and as the matter has now been fully investigated, we, as Messrs. De Haen's agents here, beg to hand you a copy of Dr. Versmann's analysis of the article in question.

The analysis proves that the compound manufactured by Messrs. E. De Haen and Co. and brought into the English market by us, is good chloral hydrate and nothing else; it is not chloral alcoholate.

There is no doubt Mr. Mason wishes to show, and he plainly states so, that from a variety of samples representing different manufactures, the product of one particular firm only is to be relied upon, and that all the other manufacturers offer the alcoholate under the name of the hydrate.

This is a very grave accusation, because the alcoholate is not a mere impurity or bye-product in the manufacture of the hydrate; it must be made on purpose, and the manufacturer selling it under the name of hydrate, must do so with the knowledge of committing a fraud,—and Messrs. E. De Haen, amongst other manufacturers, are accused of this fraud.

We must here be satisfied with proving the utter absence of truth in Mr. Mason's analysis as far as Messrs. E. De Haen and Co. are concerned, and we do so:—

1. By producing Dr. Versmann's detailed examination of samples representing large quantities.
2. By an extract of a letter received from Mr. Umney, who writes:—"I have on several occasions during the past year examined specimens of hydrate of chloral as consigned to you by Messrs. E. De Haen and Co., and have always found them to be hydrate, and never alcoholate, of chloral."
3. By Mr. Mason's own conflicting evidence. He states our cake yields 57 per cent. of chloroform, our crystals 56 per cent. Both cake and crystals are therefore represented as inferior to alcoholate; but by the solubility in water and insolubility in chloroform, he shows them to be hydrates. His own statements contradict each other, and prove how much value may be attached to his analysis.
4. By Mr. Mason's own confession. In answer to our inquiry how the samples had been obtained he writes: "I had the verbal declaration that this was De Haen's manufacture (I am morally certain of this), but much to my surprise, I learn this morning that the manufacturer of the cake is Saame, of Göttingen.

This statement of facts will, we trust, suffice to demonstrate how unsuccessful and untrustworthy Mr. Mason's attempt at scientific investigation is, and as by the reprinting in your Journal of Mr. Mason's paper serious injury may have been done, we request, in justice to the house we represent and to ourselves, the insertion of this letter and enclosed analysis of Dr. Versmann. DOMEIER AND CO.

"*London, E.C., January 30th*, 1871.

"Gentlemen,—I beg to submit to you the result of my examination of samples of chloral hydrate manufactured by Messrs. De Haen and Co. of Hanover, and received from you for analysis.

"I selected these samples from a large stock at your warehouse; they fairly represent about 4 cwt. of chloral hydrate in crystals, put up in 1-lb. bottles, and 16 cwt. in cakes, put up in jars of about 12 to 14 lb. each.

"The object of this examination was not only to determine the degree of purity of the articles, but especially to prove the presence or absence of chloral alcoholate.

"I have compressed the results of my examination in the subjoined table,* and I feel justified in stating that the chemical reactions and physical properties of the samples unmistakably prove both the crystals and the cake to be genuine and good marketable chloral hydrate, not inferior to the product of any other manufacturer, and perfectly free from chloral alcoholate.

"I have the honour to be, gentlemen,

"Your obedient servant,

"FRED. VERSMANN.

"*Messrs. Domeier and Co.,*

"*47, Basinghall Street.*"

THE SALE OF DRUGS BY GROCERS, ETC.

Sir,—I was very glad to see your correspondent, Mr. Carroll, bring before the notice of the trade the great injury done to legitimate chemists by hucksters selling popular medicines. Some months ago you kindly inserted a letter of mine on the same subject; this was written in the hope that other correspondents would take the matter up, and agitate until something definite was decided on by the Council.

This evil has been considerably increased since the passing of the Pharmacy Act; before that date the grocer or smaller shopkeeper had a certain vague notion that it was wrong to sell medicines, but now, thanks to the smaller wholesale houses and registered chemists, unworthy of the name, they are sufficiently well-informed to know that they may retail any drug or chemical compound under the sun, so long as it is not of a poisonous nature; and, moreover, as these persons on an average sell their articles at 50 per cent. less than the respectable chemist, they are compelled to buy the vilest trash imaginable. Many of them still continue to sell laudanum, anodyne cordial, infants' mixture, etc., articles which formerly contained veritable opium; but now the large-hearted wholesale dealer in his kindly endeavour to shield his innocent customers from the consequence of legal action, omits that essential drug and compounds his tinct. opii from caramel and a small portion of catechu, his anodyne from treacle-and-water flavoured with some essential oil, his mixture from chalk and English rhubarb; these articles, from the large part played by that necessary and cheap ingredient oxy. cum hydro, bear a very nice profit, which of course is a great incentive to the manufacturer to push this branch of his business. The sp. æther. nit., of which a large quantity is retailed at 2*d*. per oz. by these people, would probably require the services of a very high-class chemist to analyse, or, perhaps, it would be imperative to invent a new hydrometer to take the specific gravity.

Another consequence deducible from this great imperfection in the Pharmacy Act is, that herbalists, Coffinites, etc., who were formerly content to keep within the bounds of their proper businesses, have now branched out into selling castor oil, sweet nitre, magnesia, etc., knowing they can do so with impunity.

In the face of this grievance, one is apt to ask the pertinent question, What is the actual advantage of paying a large premium, passing a long apprenticeship, expending a large amount of time and money in books, lectures, etc., and ultimately making a *début* as a full-fledged pharmaceutist? He can dispense physicians' prescriptions, certainly, but unfortunately, with the majority of English chemists, this hardly pays rent and taxes; he can also sell poisons, but here, again, the average sum total taken in poisonous articles, forms but a small portion of the day's receipts; it appears, therefore, that the major portion of an ordinary country chemist's business is still open to the competition of the world, our boasted Pharmacy Act notwithstanding.

Mr. Carroll truly observes, "They manage things better in France, where the pharmacien holds his proper position as determined by law." There, a paternal government recognizing the fact that a pharmacien must undergo a laborious and expensive course of training before being qualified for his post, a circumstance unconnected with any other trade, endeavours to protect him as much as possible from undue competition; in fact, puts the hen-coop over the chickens to prevent the fox preying on them.

The remedy for this grievance is very simple, and would be easily applied, viz. make it penal for any person, not being a registered chemist, to sell any medicine intended for internal or external use, a law at present in force in every country in Europe except our own.

I trust some of your many able correspondents will give this subject the consideration it deserves.

A COUNTRY M. P. S.

Sheffield, January 26th, 1871.

P.S. I was much amused to-day by seeing in a grocer's window a large box, the label printed in bold black type, announcing the contents to be "Aunty Billy's Pills." Had the late A. Ward been a member of this pill-mongering firm, surely he would have added "this is rote sarcastical."

* The results are given on p. 62.

J. North (Reading).—The Pharmaceutical Society cannot be made a medium for the transaction of bookselling business.

J. Thomas.—We are much obliged to our correspondent for the enclosure.

G. C.—We do not know of any method for the artificial production of the oil.

M. P. S. G. B.—Cresylic acid is, like carbolic acid, a constituent of the coal-tar from gas-works; and we believe it may be obtained from any maker of carbolic acid.

"*Inquirer*" (Barnstaple).—We think that the "Balm" label would render the article liable to duty; the other label, which simply gives the dose of a pharmacopœial preparation, without reference to the treatment of any disease, would not.

W. A. (Hammersmith).—We think that No. 1 would come under the decision of the revenue authorities, that the words "Cough Lozenge" do not involve the payment of duty; but that the introduction of the other lines in No. 2 and No. 3, mentioning the diseases for which the article is recommended, and the dose, would render it liable. You had better communicate with the Revenue authorities at Somerset House.

Carolus and *Q.* are referred to the paper by Mr. Gale, in which the subject is fully treated of, already published in the PHARM. JOURN. 2nd ser. Vol. I. p. 497.

Chloral Hydrate.—At the moment of going to press we have received a letter from Messrs. Schætensack, in which they complain that the results contained in Mr. Mason's paper, and relating to the chloral hydrate, which they import, do not correctly represent its quality. They also state that they have submitted their chloral hydrate to analysis, and that they purpose communicating the results to the Journal. We shall be happy to do anything in our power for giving publicity to any well-founded reclamation, but the letter sent by Messrs. Schætensack for publication has reached us too late for insertion.—ED. PHARM. JOURN.

Meal Worms and Insects.—To. J. G. O.—The ravages in your packet of Embden groats have been made by the *Tenebrio molitor*, Linn., a small beetle, whose larva is known as the meal-worm. Westwood says it frequents bakehouses, corn-mills, granaries, ship-biscuit stores, and similar places, and does much damage by devouring meal, bran, flour, and occasionally cloth and wood.—J. A.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Agnew, Mr. C. R. C. Titchborne, Mr. G. H. Cockerell, Mr. J. North, Mr. S. Kellam (Galveston), Mr. J. Robbins, Mr. T. Hopkinson, Mr. F. Warnford, Mr. J. S. P. Rowe, Mr. S. Hallam, Mr. J. D. Allman, Mr. T. C. Jones, Mr. G. V. Druce, Mr. H. J. Church, Mr. R. G. Mumbray, Mr. G. Morgan, Mr. J. B. Bayley, Mr. J. Wain, N. C., J. T. N., A. P. S., H. W. T., I. S. W. T., S., "A City Pharmacist," "Senega," "Provincial," "Sarum," George Oldham.

THE MICROSCOPE AND ITS REVELATIONS.*

BY W. B. CARPENTER, M.D., F.R.S., F.G.S., F.L.S.

The modern microscope may, I think, be regarded under three aspects—as an instrument of scientific discovery, as an educational instrument, and as an instrument for affording an almost endless amount of rational recreation. I do not intend this evening to enlarge upon the first of these uses, because, as I understand, the object with which I was asked to bring the subject before you was that I might specially dilate upon the educational advantages, and the use of the instrument as a means of rational recreation. I hold it extremely important that every young man should learn, not only how to work but how to play. I think that to find a means of constant and attractive recreation, and especially one which combines the double character of quiet work at home and occupation for any amount of time, and, on the other hand, which will occasionally give a zest and interest to a walk abroad, is to find that which is one of the very best appliances that any home can have. I have found it so myself from my own boyhood, for I may say that the modern microscope and I have grown up together. It was just about as I was entering on my own educational course that that remarkable improvement was effected which I shall presently describe to you as the achromatization of the microscope. It was the introduction of the achromatic principle, which had already been applied to the microscope, which converted it from a mere scientific toy, for really it was very little better, into an instrument quite on a par with the most costly and elaborate telescope, as a means of scientific research. As I have said, the microscope and I have, in some sense, grown up together; and it is an instrument, from my own experiences of its uses, in all its aspects most precious in my eyes. It is known to most of you that I have made certain branches of microscopic research the main study of my own life, and I have also felt its advantages in the education of my own children so highly, that I do not think there is any single means of education that, on the whole, I estimate so much. It gives that special training which none of our ordinary studies do give, that is, the development of habits of careful and accurate observation, and in addition to that, the habit of reasoning upon observation. Those two directions of the mind, the training and discipline of the observing powers, and with that the training and discipline of the power of reasoning upon observation, I think distinguish scientific study, rightly pursued, from all our ordinary means of educational discipline; as, for instance, the study of classics or mathematics, which latter reasons entirely on abstractions, and is confined to reasoning of a particular kind, limited in a narrow groove, as it were. Here, however, we have a training of the faculties of discerning the probable, the improbable, the certain and the uncertain,—in fact, all that kind of discipline which, in the ordinary walks of life, is so extremely valuable. Thus, as I have said, to those young people who have been trained in this habit, who have learnt the value of it, and who desire a rational occupation of their spare time, and something which shall give an attraction to the ordinary work of life, nothing can be superior to the microscope.

These are the reasons, therefore, for which I advocate, and have often advocated, the use of the microscope, especially here, where I know there are a large number of young men who are closely confined during the day in business avocations, and who yet have more or less time to spare in the evening, one great advantage of microscopic study being, that it may be carried on as well by lamplight as by daylight, with the exception of certain advantages which daylight has; but, on the other hand, lamplight has its advantages, and for much of my own study I prefer it, because it is more manageable, and can be easily adjusted to exactly what is required.

A few words, in the first place, upon the microscope itself. I shall not dwell upon its general philosophical principles, presuming that you are acquainted with the general construction of the ordinary microscope. All that I shall endeavour to explain to you is the great improvements to which I have referred under the term achromatization. Achromatic means destroying colour. It does not mean that the microscope does not show the colour of the objects submitted to it, but that it does not show any false colours, or any which do not belong to the object. The old microscope was constructed in this manner:—The object-glass screwed at the lower end of the tube, and then an eye-piece at the upper end, that eye-piece consisting of two or more lenses. Now, the object-glass of the old microscope was a simple lens, an ordinary double concave lens; but the simple lens was employed as an object-glass, and a compound microscope gives extremely false effects. In the first place, the spherical curvature of its two surfaces does not bring the rays of the central part and the spherical, or outside part of the lens to the same focus; and therefore, if the lens have a large aperture, you have a great amount of what is called spherical aberration; that is, the rays that come through the central part and the rays that come through the spherical portion do not meet in the same focus. Therefore, if you focus it for one, all the other rays produce a sort of foggy effect. Then, besides that spherical aberration, every such lens acts as a prism in dispersing the colour, producing that kind of effect which you see with any ordinary prism, or with the cut-glass prisms on a chandelier, which are so cut for the express purpose of producing prismatic refractions. Therefore, every object seen through such a microscope had fringes of colour produced by the dispersion of the coloured rays. In order to reduce this to the minimum amount, it was necessary to contract the aperture, and accordingly the object-glass of the old microscope had an extremely narrow aperture; it was brought down to merely the central portion of the lens; and even with that, although the spherical aberration could be considerably reduced, yet there was always achromatic aberration, and the greater in proportion to the power. This defect had long previously been corrected in telescopic lenses. The large object-glass of telescopes was constructed by the union of flint and coarse glass, and the corners were ground in such a manner as to correct almost entirely both the spherical aberration and the achromatic. But it was considered quite chimerical to attempt to apply the same principle to lenses so small as the object-glass of a microscope. It was considered that the manipulative skill of those who had to grind these glasses was never likely to succeed in producing combinations which curves

* Delivered at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 1, 1871.

should answer the same purpose with microscopes which these large lenses do with the telescope, the principle of construction in the two instruments being the reverse of each other in this respect. The power of the telescope is gained by a long tube and an object-glass with a long focus, and to get a very powerful telescope you require a very large lens, the limit there being the size of the flint glass that can be produced of sufficiently good quality. I believe at the present time object-glasses for telescopes are being made twenty-five inches in diameter, and that is the largest yet produced. On the other hand, in the microscope the power is gained by diminishing the focal length of the lens, and, in diminishing the length, the lenses themselves must be made upon a more minute scale. I shall not go through the successive steps of the process by which these powers were obtained, but it is interesting to mark that men of science in different countries were at work about the same time, in conjunction with mechanicians of skill in glass grinding, in producing achromatic lenses for the microscope. Dr. Goring, in London, within my own recollection, set Mr. Tully, who at that time was a celebrated maker of telescopic lenses, to work upon what would now be called a very low power for the microscope; and I remember very well hearing at the time that Mr. Tully, after long and numerous trials, succeeded in producing what we should now call a very inferior lens; and that, upon Dr. Goring asking what he had to pay for it, Mr. Tully said he could not estimate his time, at the very least, at less than £50. Lenses far superior to that can now be bought for about 15*s*. At the same time Professor Secchi, in Italy, and M. Chevalier, in Paris, were at work on the subject, and they produced achromatic lenses of higher power than those of Mr. Tully. Not long after that, a most estimable man, not long since deceased, Mr. Joseph Jackson Lister, applied very considerable mathematical powers to the investigation of the means of combining these lenses. It was soon found that the telescope plan did not answer at all for the microscope; that is, the plan of having the flint glass concave between two convex lenses of crown, was not effective for the microscope, but a much better effect was produced by combining two or three pairs of lenses,—a flint concave and a crown convex,—and that is the mode of construction which since that time has been adopted. Dr. Bentley has kindly lent me a diagram, showing the plan of construction adopted in object-glasses at the present time. Here are three pairs, concave of flint and convex of crown. The different curves are ground with very great care and accuracy, in such a manner as to correct both the spherical and the achromatic aberration, that is, to bring the rays of the central and peripheral parts of the lens to the same focus, and thus correct the spherical aberration and prevent any foggy appearance, and, at the same time, prevent any achromatic aberration, so that there shall be no false colours in any part of the object, and especially at its edges. There are different plans of combination. Some makers put a single lens in front, and a combination of three behind. There are different combinations for different powers, and different makers have their different methods, but they all go on the same principle; and at the present time the most extraordinary accuracy in workmanship has succeeded in producing lenses of a degree of minuteness that can scarcely be conceived. Messrs. Powell and Leyland have produced a combination lens of only a fiftieth part of an inch focus. I suppose the largest of the three does not exceed in size an ordinary pin's head, whilst the smallest must be scarcely larger than a pin's point, certainly not larger than a pin hole in a piece of paper. The practical skill which our mechanics have acquired has enabled them gradually to cheapen the construction, and this is a matter of great importance to those who desire to use the instrument as one of recreation and education. I may take some little credit to myself for having promoted this object, for in the year 1851, after the Great Exhibition, I induced the Society of Arts to offer a prize for a three-guinea achromatic microscope. I was laughed at excessively for thinking that an achromatic microscope could be made for three guineas, all the London makers saying it was entirely out of the question. The few first-rate makers then in the trade would have considered it lowering their reputation to condescend to anything of the kind. There were, however, second-rate, or perhaps, you may say, third-rate makers, who thought it worth their while to see what could be done. A jury was appointed by the Society of Arts, of which I was a member, and we selected a microscope made by Mr. Field, of Birmingham, a well-known manufacturing optician, and he informed me five or six years ago that over two thousand of these microscopes had been sold; and I dare say since that time more than double the number have been disposed of. That was the beginning of an improvement which has gone on continuously since; and makers both in London and the country are continually bringing under my notice microscopes, and especially achromatic microscopes, of cheaper construction and offered at lower prices. They are now beginning to feel what I have been preaching for a long time, that the best lenses for ordinary use are not those which serve best to display what are called test objects. I have sometimes likened the difference between these instruments to that between an ordinary roadster and a racehorse. You do not use a thoroughbred racehorse for ordinary every-day work, and, on the other hand, a roadster has qualities which, though they do not enable him to run races, make him a very useful animal. It is just the same with regard to these different qualities of lenses. There are certain achromatic combinations which are very costly, as they require a marvellous precision and finish, and which, therefore, it is impossible to make cheap. On the other hand, there are some combinations of what is called a much lower angle of aperture which are really best for ordinary use, which give the best view of an object, and which can be made at much less expense than the others. Very recently there have been imported into this country from Berlin a series of achromatic lenses of different powers at most extraordinarily low prices. They are known as Gimlach's lenses; and, having examined several of them, I have been really astonished at the excellence of the work that is produced in comparison with the price. For example, a lens of about one-third of an inch focus, costing 18*s*., is quite equal to a lens which I gave one of our best makers four guineas for a few years since. You may now have a microscope for £5 which I should have been most thankful in my earlier days to have given £20 for,—I mean with regard to its applicability to working purposes.

In the instrument itself there have been various improvements. One of those I have now before me is a very excellent example of the ordinary pattern of a student's microscope,—one which is capable of having various appliances added to it, which make it a very useful instrument. There are two plans of construction which I think it well to mention, because I very much hope that the direction that microscope-makers will take is that exemplified in one of these, and which I maintain to be the right one,—most instruments up to the present time being constructed on what I consider a wrong principle, mechanically and practically. In this microscope, which is constructed on what is called the Ross model,—it having been produced by Mr. Ross, I believe the grandfather of the gentleman lately dead,—the body or tube of the microscope is fixed at the bottom into an arm; then there is a transverse arm that is supported upon a rack stem. Now I apprehend a very great object in all microscopes is to obtain steadiness in the object; that is, that when you look through the microscope the object shall not seem to dance. The reason of this dancing is that the eye-piece has a tremulous motion which the object itself has not. If the whole microscope moves together, and the motion is equal in every part, you have no apparent motion of the object. For instance, during the last three years, during each summer of which I have been using the microscope on board ship, I fixed my instrument well down to the table, if the ship was rolling much, holding the leg of the table between my knees, and so fixing myself securely; and during the whole of the time this instrument has been my companion, and I have found so extremely little tremulous motion, even under the most trying circumstances, when the steamer has been going at full speed against a head sea, that I hardly perceived any of that objectionable motion in the object, the microscope and my eye going together. If there is no motion of any one part upon the other, the object will remain stationary; but if the eye-piece moves more than the object itself, then the object will appear to dance. Now my friend and colleague Dr. Wyville Thomson had with him a microscope constructed on the Ross model, and I found that I could work with my instrument under these trying circumstances with a power about four times that which he could; that is to say, the tremulousness of mine with a quarter-inch focus, which is a high magnifying power, was not greater than he found with a lens of one inch focus. This was the practical proof of the superiority of the one method of construction over the other, and I think all who have any knowledge of mechanics will see at once the superiority of this model. All metal-work has a certain elasticity about it, especially a drawn tube such as that of which the microscope body is made; the consequence is, that when the centre of movement is at the bottom of the tube, from which springs the rack upon which is placed the object-glass, there is the whole length of the tube to vibrate backwards and forwards. On the other hand, in this plan, which was devised by the late Mr. Jackson, of Spitalfields, the body is supported on a solid limb about the middle of its length, and a solid limb is carried down which supports the stage; and the body being thus supported about the middle, the vibration is equally distributed, so that there is practically hardly any vibration at all. My conviction is very strong, that if it had not been that early microscope makers had got up their patterns on this model of Mr. Ross's, they would soon have abandoned it; but we know that when manufacturers once get a stock of patterns they are loth to change them, and I am afraid I shall not live to see this improved plan brought into general use. Messrs. Smith and Beck, however, have adopted Mr. Jackson's model, and some of the makers who have been educated in their workshop have followed. I hope I shall not be considered to be dealing unfairly by other makers if I mention that the maker of this instrument, Mr. Crouch, also makes a student's microscope on the same plan, about the same size as this Ross model, which I consider much superior, the body being supported in this more stable manner. I mention this with the more confidence, because I know his instruments are now coming into general credit. My friend Professor Michael Foster, of Cambridge, lately of University College, who is now organizing a physiological laboratory there, has informed me that he finds Crouch's microscope a most satisfactory instrument. I am speaking now merely of the plan of construction, which I consider far superior, and I hope in time all makers will adopt it.

The other great improvement which the microscope has more recently sustained is the introduction of the binocular principle, which is simply the adaptation of the principle of the stereoscope. I shall not go into the history of the manner in which this was worked out, though it is very curious and interesting, and I have been a party to it from the very commencement, having in my possession one of the first to which it was successfully applied. We all in England now use the plan devised by my friend Mr. Wenham, and for those who, like myself, work with lower powers, and who are in the habit of looking much more at opaque solid objects than flat transparent ones, the binocular is a comfort I can scarcely describe. The difference in the fatigue which it produces, not only of visual but of mental fatigue, would surprise you, perhaps, but it is easily accounted for. When one has to estimate the form of a solid object with an ordinary single-bodied microscope, it is necessary to focus it up and down, in order to form by that means an idea of the projection of one part and the sinking in of another. The binocular gives you that unmistakable representation immediately; you have not to think about it at all,—you cannot help seeing it, any more than I can help seeing that this instrument before me is a solid form. I therefore always strongly recommend a binocular microscope to those who are really desirous of possessing a good instrument; and the cost is now so very much reduced, that it is really far better to incur it at the beginning, and to add the objectives gradually, if your means are limited, than to begin with an ordinary single-tube microscope and have to change it at a subsequent time. The value of the binocular is now becoming more and more appreciated. Several of my scientific friends who use the instrument merely as a means of research, rather laughed at me for my enthusiasm about it, and said they did not find any particular benefit in it, but one after the other they are gradually coming to the same view. For instance, last night Mr. George Busk was at my house, when he said he had lately had an opportunity of working with the binocular, and had come to the conclusion that he could not do without it.

Thus much must, I think, suffice with regard to the instrument itself. I would advise those who may be thinking of beginning microscopic inquiry to be satisfied with lower powers in the first instance. Learn to use them well with any ordinary objects you may pick up, as, for instance, the different parts of a fly or a plant simply laid upon a black or white ground, as the case may be, light coloured objects being best seen on a black ground, and dark objects on a light ground. Lay these objects in this way on a black or white ground and study the characters of the different parts, the management of the light and the mode of using the instrument, before you attempt to deal with higher powers. By this means you will save yourself a great deal of trouble and be going through a very valuable education. The lower powers are now made specially with educational microscopes; in fact, it was a special point which I insisted on with the Society of Arts microscope, that there should be a lower power of this kind, and I recommend all those who are commencing the study to begin with learning the use of them. You will find it wonderful how many plain ordinary objects, that come under your cognizance every day, may be seen in quite a new aspect, even by the use of these low powers.

We will now begin the exposition of the use of the microscope, by speaking of one of the most familiar of all objects,—a piece of chalk. I thought I could not do better than introduce this to you in its natural history aspect, because it is one you are all familiar with in its common every-day appearance. It will, perhaps, interest you rather more when I connect it with the work upon which I am myself engaged. For example, in this little box upon the table is a piece of what we may call modern chalk, which is now being formed on the bed of the Atlantic. This was brought up a year and a half ago from a depth of nearly three miles, 2435 fathoms. We brought up about 1½ cwt. of this in our largest deep dredges; and I venture to say that any of you looking at this would see no difference at all between it and an ordinary piece of chalk, except that it is a little browner, but still many varieties of common chalk are quite as brown as this. The microscope has shown that chalk is commonly composed of the remains of minute shells; sometimes the shells are found in great abundance, perfect as we find in this globigerina mud, as we call it. These shells are so small that they could scarcely be seen by the naked eye,—a single shell on a black ground would appear as the merest white point, and thousands of them would be required to weigh a grain; yet the aggregation of these, that is now going on at the bottom of the Atlantic, is forming an immense area of chalky deposit, the thickness of which we do not know. We know, however, the thickness of that which has been raised in the chalk cliffs of Dover, for example, and in the centre of Europe generally, which is several thousand feet in many instances; and you may, therefore, conceive what a vast lapse of time must have been required for the accumulation of such a deposit. We believe that the *Globigerinæ*, now living on the bed of the Atlantic, are the lineal descendants of those which formed the chalk in England and Europe generally, but that, when that was under water, it is very probable that there was dry land in what is now the bed of the Atlantic. We know, geologically, that there is every probability that oscillations have existed in past times, such as we know to be going on at the present very slowly. Mr. Darwin, many years ago, first brought himself the high reputation which now attaches to his name, quite irrespective of the peculiar theories called Darwinism, by the observations that he made during the voyage of the 'Beagle' on the coral formations of the Southern seas, when he showed that there are great areas of subsidence over which the bottom of the ocean is sinking very gradually, and, on the other hand, that there are areas of elevation, where very recently coral ridges have been brought up above the surface of the ocean, forming cliffs. The great mass of the continent of Europe, having the form of chalk, must have been lifted up in that manner; and, on the other hand, there is every probability that at the same time the bed of the Atlantic was going down, and that these little *Globigerinæ* gradually migrated from one part to another; and that, therefore, those now covering the bed of the Atlantic are the lineal descendants of those who lived in Europe during the chalk period; there is no difference whatever between them. We found from particular specimens of chalk, for it is not all chalk that shows the perfect shells, just the same differences that you will find in different specimens of old chalk. The larger part of both consists of granules of extreme minuteness, requiring high powers of the microscope to study them fully; they have been termed coccoliths and coccospheres. My friend Mr. Huxley first discovered the coccoliths in an examination of the soundings taken for the first Atlantic cable; they were afterwards recognized by Mr. Sorby in the chalk, and they were also found by Dr. Wallich; so that we have this correspondence, not merely in the *Globigerinæ*, but also in these curious little bodies which seem to be related to that very widely-diffused animal substance that you have heard a great deal about lately under the name of protoplasm. I see in the last number of *Vanity Fair*, which contains a most characteristic likeness of Professor Huxley,—caricatured certainly, but still showing at once his great power and good humour in a most remarkable manner,—a statement that he invented protoplasm. Of course, nothing can be more ridiculous than such a statement, for protoplasm had been talked of for twenty years before Professor Huxley mentioned it, and he himself would be the first to disclaim any such appropriation; but it is a remarkable fact that just at the time when I was out on the first of my deep-sea expeditions, Professor Huxley, in a communication to the British Association at Norwich, referred to an examination he had made of some of the soundings made for the Atlantic cable, in which he found that these coccoliths and coccospheres were diffused through a layer of protoplasm that does not belong to the *Globigerinæ*, and this I have been myself able to confirm, and to ascertain that this mud which we brought up is, so to speak, a living mass. The whole of it is alive; not that it is merely a collection or aggregation of individuals of the *Globigerinæ*, but that the peculiar tenacity which we observed in this mud, its stickiness and the difficulty we found in passing it through a sieve, all corresponded with his view, that the whole of the mud is a mass of protoplasm, through which the *Globigerinæ* are distributed, and to which these minute bodies belong. A very eminent observer in France, Dr. Ecker, has lately come to a conclusion of a similar kind, by his own examination of this very material, that this is a general characteristic of the chalk both of old and recent formation; they correspond precisely in all their particulars.

With regard to the other animals that are found imbedded in it, those fossils which give the particular geological character to the epoch, it is not my intention to say anything more than merely to mention that whilst a great number of these have undoubtedly become extinct, of those which flourished during the cretaceous period when the great chalk deposits of Europe were being formed, we have found a considerable number, and the researches of our American friends in the Gulf of Mexico are adding largely to the number of forms which exist in the old chalk deposit, so that we believe these to be the descendants, though modified in the lapse of time, of those which flourished during that period. There is some discussion at present going on as to how far my friend Dr. Wyville Thomson was right in his assertion, that we may be considered as still living in the cretaceous period. He enunciated that doctrine on the basis I have mentioned to you, that there is every probability that this great chalk formation going on in the bed of the Atlantic is continuous with that which formed the Dover cliffs and the great chalk deposits of central Europe, and that a large proportion of the animals that are now found in their deposit may be regarded as the descendants of those which flourished during the cretaceous period. But as Sir Charles Lyell has very justly pointed out in his recent book, 'The Students' Manual of Geology,' the termination of what we are accustomed to call the geological cretaceous period was marked by the disappearance of so many types of which the fossil remains are found in the old chalk, that geologically it must be considered as the conclusion of that period. This is really very much a question of words after all, like the question which I remember some twenty years ago agitated our law courts, arising out of a claim to very valuable property which had been purchased with a view to making paraffine oil, and the question was whether a certain substance was or was not coal. Almost all the chemists and geologists in England and a great many mineralogists were carried down to Edinburgh to give evidence on the subject, but the difficulty was to define what was coal. And so the difficulty here is to define what is meant by a geological period. All I care about is to have it admitted that this modern chalk deposit is not a mere repetition of the old chalk, but is a continuation of it on a different area; many of the animals having migrated into that area, while on the other hand, many no doubt have died out.

Now I am anxious to show you what is the nature of the animalcules of which this *Globigerina* is an example, because among the many efforts of modern microscopic study I do not know anything more remarkable or more important in its general bearing on physiological doctrines than the proper appreciation of the nature of their—I can scarcely call it structure or organization, for it is a remarkable fact that they have nothing that can be called organization or structure. In some way they make these beautiful shells, but the soft body of the animal that makes them is apparently destitute entirely of anything that can be called organization. That I shall now explain to you. On the wall are some drawings of these creatures, and amongst them you see some remarkably regular forms. Here is a piece of nummulitic limestone, of which the pyramids of Egypt are built, and you notice the regular manner in which the nummulites or small discs, so called from being in appearance like small pieces of money, are arranged, the whole surface being divided regularly into chambers, which are grouped in a spiral starting from a centre. We find several forms of that kind here, in the *Cristellaria*, the shells of which are formed of sand. The creatures have not the power of exuding a shelly substance from their bodies, but they make a calcareous shell by gluing together grains of sand, and building them up with extreme regularity in their spiral forms. They are very much like a nautilus; and I remember the time when they were universally reputed to be minute nautili, and were always so arranged, as for instance, in Cuvier's 'Animal Kingdom,' under the Cephalopods. But an eminent French naturalist, who, if my impression is correct, was a pharmacien, residing somewhere on the seacoast of Brittany, M. de Jardin, applied himself to the study of these bodies, and after some time he came to a conclusion, which has been since confirmed by the most careful and prolonged scrutiny. He degraded these animals at once from being amongst the highest of the invertebrate subkingdom, the Cephalopods, of which the nautilus stands at the top (the highest organization below fishes), down to the very lowest, and he was perfectly right in so doing. He found that the body of these animals consists of nothing but a soft jelly-like substance, which we now call protoplasm. He called it sarcode, which was a very good name, meaning something which is like flesh and answers the purpose, but is not flesh—a sort of rudimentary flesh. The word protoplasm was first invented by the botanists, and we now know that the sarcode of De Jardin and the protoplasm of the botanists are the same thing exactly. This sarcode itself can be obtained when we have the fresh animals by just dissolving the shell in acid, and we then get the sarcode body; here are representations of them seen both as opaque and as transparent objects. You see it has nothing like a structure or organization, but consists of separate little balls, so to speak, or segments progressively increasing. The original animal was the smallest of these segments, and it formed one chamber or shell; then by a gradually growing-up process which I shall describe, it has formed another segment, which in its turn formed a shell around it; then another larger segment, and so on. We find generally, from eight to twelve or more of these segments in one *Globigerina*. Then any further increase will take place in such a manner that the bud will separate and give rise to a new and distinct individual. That, however, is not necessarily so, for I shall presently show you that in a remarkable fossil which has been discovered within the last few years in Canada, the *Eozoön Canadense*, which is the earliest of which we have any knowledge, the extension takes place continuously by what is called continuous germination, the difference being just that between a plant and a tree. A plant has a limited growth. It does not increase by budding beyond a certain extent, and an annual plant dies at the end of the year, and there is an end of it, as an individual, though its seed may spring up again. On the other hand, a tree goes on putting out fresh buds every year; old parts gradually die away, but new and fresh parts come into existence by this extension from the original primordial stock. In the same way it is quite conceivable, as you will at once see, that the bottom of the ocean might be covered with one continuous mass of shell-deposit, produced by this protoplasm or sarcode, which is covering it at the present time; whilst on the other hand, this little *Globigerina*, instead of producing one continuous extension, produces an enormous aggregate of what we are accustomed to call separate individuals; simply because when a certain number is reached, the next bud is detached and begins a new shell, instead of going on in connection with the old one.

Our best knowledge of the nature of these animals is derived from the study of some of the fresh-water forms, which are within the reach of every one. The Hampstead ponds are full of them. They were formerly called *Protei*, from the extraordinary variety of shapes which they present while being observed, but they are now called *Amœbæ*. And we need not even go up to the Hampstead ponds for a specimen, for there is a very interesting paper in the last number of the *Quarterly Microscopic Journal*, by an Italian priest residing in London, who, following up some observations made in Germany, has found that these *Amœbæ* are almost universally present, not only amongst the stems of aquatic plants, etc., but that even on pulling out a bit of moss from a damp wall and shaking it in water, some of these *Amœbæ* are detached. It is a new and rather peculiar type, varying a little from the ordinary forms, but affording a most ready means of study within the reach of every one. Sometimes even you may find a bit of moss between the paving-stones in a back street which will afford you specimens for examination.

This *Amœba* I hold to be one of the most interesting of all microscopic objects, because it presents us with the phenomena of life in the most elementary form possible. It is a little bit of animated jelly, changing its form continually, and having nothing that can be considered an organization save this, that the outside of it is a little more dense than the inside. There is no skin, no definite membrane, but the exterior surface is like stiff jelly, while the interior is more like thin jelly; in fact, it is almost liquid. One of the most curious phenomena connected with it is the continual movement of particles in the interior. If you have some of these under the field of the microscope, you observe a continual agitation of the particles in the interior; this agitation will then appear to proceed in a certain direction, and will elongate itself into a sort of finger-like process, into which the body will appear to be drawn: then, perhaps, another will shoot out in another part, and gradually the body will follow and be drawn into that and so on; and in this manner it will gradually travel over the field of the microscope. It is by means of this movement that the creature gets its food. It comes in contact with some particle that may serve as nourishment to it; this particle penetrates the substance of the body through any part of the exterior, and this proves distinctly that there is no membrane. A mouth extemporizes itself anywhere, the particle is taken in, and when inside it becomes subject to this continual current that is moving about it. It thus undergoes a kind of digestion, and if there is any hard part left in this particle, after a time it works its way out through the surface again and is left behind. The body moves away from it and it gets out through the last edge of the surface-film and is thus extruded, so that an anus is extemporized as well as a mouth. In this manner this creature is continually travelling here and there, taking in articles which it has the power of appropriating, and thus, without anything that can be called organs, it performs all the functions of life. It takes in food without a mouth, it digests it without anything which can be called a stomach, and it gets rid of inappropriate matter without anything which can be called intestines or an anus. It moves without muscles or a nervous system, and it propagates itself by subdivision. Indeed, there is some reason to think that it goes through a very curious process of conjugation: two little bodies meeting together, become fused into a mass which is the commencement of a new set of generations. Upon that point, however, further observations are very much wanted—and observation extends over several months—to see whether a winter change takes place in them as it does in many animalcules, a preparation for a sort of torpid condition, which shall give place to renewed activity in the spring. This is a point on which any one with sufficient perseverance, who will devote himself to this branch of the inquiry, may really do very good scientific work, and at the same time he cannot fail to interest himself exceedingly.

This is the simplest and most elementary form of life; and I shall surprise you, perhaps, when I tell you that there are certain corpuscles floating about in the blood-vessels, the white or colourless corpuscles, which extremely resemble these *Amœbæ*. If you draw a drop of blood and put it under a sufficiently high power of the microscope, and by a little application of heat keep it at about the temperature of the body, covering it with glass so as to prevent evaporation (not, however, pressing too much upon it), you will find in the midst of the red corpuscles,—which you know are disposed to run together in piles, like pieces of money,—in the clear spaces left between, you will find what are known as the white or colourless corpuscles of the blood, and if you observe them attentively you will see the same kind of movement in the interior, and the same changes of form as are noticed in *Amœbæ*. They put out finger-like processes in one direction and then in another, though they do not move so much over the field of the microscope as the *Amœbæ*. They are, however, essentially organisms of the same character. What their purpose is I do not purpose now to discuss, but merely mention the fact.

In the Hampstead ponds and many other collections of water you will find some other forms which are known as "sun animalcules." These are much more stationary, and get their food in a different way to the *Amœbæ*. They send out long, straight extensions, and we do not find the interior soft liquid passing into digitations, but they send out these rays, which frequently are glutinous on the surface, and they entangle minute animalcules which come in their way, just as an insect is entangled in a spider's web. The other rays bend towards the one which has got hold of anything and coalesce with it; there is a kind of attraction amongst them, and some of the body, perhaps, will extend itself towards it, in the manner represented in this diagram. A film is sent out which completely invests the animalcule, and in this way it is gradually drawn into the body, where it is subjected to the digestive process. This is a very beautiful and curious animalcule, if you have an opportunity of observing it with a sufficiently high power. It does not move from place to place, but remains perfectly stationary under the microscope; but you will see the constant action of these long processes, and the continual circulation of little granules inside, which seem to move along one side and then back along the other. Sometimes two processes meet, and the granules pass along the one and back along the other.

Both these are freshwater forms, which there is no difficulty in procuring, if you persevere in your search; but I will now proceed briefly to indicate some of the marine forms and show you wherein the difference consists. The marine forms, such as that which forms the *Globigerina*-shell, live by putting out threads of extreme delicacy through minute apertures in their shells. This *Globigerina*-shell is studded all over with extremely minute apertures, about the $\frac{1}{6000}$ or $\frac{1}{8000}$ part of an inch in diameter; in some of the *Nummulites* the diameter is less than $\frac{1}{10000}$ inch, yet through these there pass out these exceedingly delicate threads, which extend themselves around the shell. I have lately succeeded in getting some of these types with the threads extended, and I have been able to mount them as preparations, and very beautiful objects they make. These threads form a sort of animated spider's web; they cannot take in anything large, as you see, by the fact that they come out of these minute apertures, but they extend, and then they coalesce with one another sometimes, which shows that there is no membrane upon them; they are simply nervous threads, like those spun from a spider's web. They coalesce occasionally into a mass, which forms a fresh centre of departure, and in this way particles of extreme minuteness are continually being entrapped. But what is more, and I believe that is the usual mode of nourishment, it presents a very large and extended surface of sarcode, which is, I believe, always absorbing from the sea-water the protoplasm which is diffused through it, in a very dilute condition. For our researches, of which I gave an account to the Royal Society last year (and chemical research has also tended to prove the same thing), indicate that the whole mass of sea-water is to be considered as a sort of very weak broth; that is to say, in every gallon of sea-water there is so much protoplasm diffused, and that protoplasm is the result of the surface life of animals and plants. For instance, take the great Sargassa Sea, which lies in the inner circle of the Gulf Stream, the circle around which the Gulf Stream curves: in that sea there is an immense amount of floating seaweed, which is always giving off to the water this sort of gelatinous exudation; and whereas it was formerly supposed that the organic matter, which my friend Dr. Frankland found in the water around our own coasts, was merely the result of the washing down of the organic matter in rivers, and from the shore-life of shells, crabs, and so on,—we find that water brought up from the greatest depths in mid-ocean contains just the same proportion of organic matter as the surface water near to our own shores. There is evidence, therefore, of the universal diffusion of elementary organic matter, so to speak, throughout the ocean. At the bottom of the ocean no vegetation can exist, because there is no light, none, at least, that can produce vegetation, and we find no evidence of vegetative action; and you all know, I presume, that these organic compounds all begin in the first instance with vegetative life; and, therefore, our belief is that it is the vegetative and animated life on the surface which is constantly giving off to the sea this protoplasmic substance that is thus diffused through it, and becomes the food of the immense mass of life at the bottom, which again supports animals of much higher organization. For instance, at these great depths we found star-fish of very high forms, which had their stomachs filled with *Globigerinæ*. Given *Globigerinæ*, anything else can live; but how do the *Globigerinæ* live? Our theory is, that they and all other animals of that kind living at great depths are supported by this wonderful protoplasmic substance present in the water in contact with it, which it is constantly absorbing and turning into sarcode.

I may here just refer to the diagrams on the wall, which represent some of the more remarkable forms we have met with, composed of sand grains glued together and arranged in many cases, as you see, with the most extraordinary regularity and finish. One, you see, is in a tri-radiate form, the rays being always straight; but sometimes there are four, and sometimes one is aborted. These are formed of sand cemented together with phosphate of iron. I have dissolved several of them in a rather strong solution of nitric acid to separate the sand grains; and my friend Professor Williamson has been kind enough to determine that the solution contains phosphoric acid and iron. One of these affords a very interesting illustration of a fossil type, which I worked at two or three years ago in conjunction with Mr. Brady, of Newcastle, with reference to which we contributed a paper to the 'Philosophical Transactions.' It is one of the large fossil foraminifera, the larger forms of which, approaching the size of a small cricket ball, are found not only in the green-sand near Cambridge, but also in the Isle of Wight. My friend Mr. Brady had in his possession some remarkable fossils of the same kind, although growing on a different plan, which were brought by the late Mr. Loftus from the neighbourhood of Persia; they are now deposited in the Museum at Newcastle. These, though framed on a different geometrical plan—one being built up of concentric spheres, while the other is a spiral winding round a long axis—are essentially the same in their structure, and are built up of sand grains, as represented in the diagram. Mr. Brady's *Loftusia* would be just the same if, instead of being a flat spire, it was elongated. Some of the specimens I have myself examined have been two and a half inches long, and there is one in the British Museum nearly three inches. This will give you some idea of the enormous size these creatures attained in former periods.

Now, in conclusion, I will briefly direct your attention to an example of foraminiferal structure, which is probably the most interesting of any yet revealed to us, viz. the very wonderful *Eozoön Canadense*, of which I have a very beautiful specimen in my hand. This is found in what are called the Laurentian rocks, in Canada. The Laurentian formation is the earliest kind of stratified rocks at present known. I say at present, because Sir William Logan, by whom it has been examined and described, says it contains pebbles of older rocks, and that he does not at all despair of discovering some older state of stratified rocks. At present, however, it is the oldest known, just as the Silurian strata of Sir Roderick Murchison were twenty or twenty-five years ago. Of the relative position of these Laurentian rocks you may judge when I tell you that they are about as far below the Silurian in geological order, and certainly in the time that must have elapsed between their formation, as the Silurian rocks are below the present time. The oldest previously known would come about the middle of the series. And when we consider that the older strata below are much harder, and must have taken a much longer time to form, the probability is that the lapse of time between the two must have been many times as great. The structure of this formation is that which is known as serpentine limestone. Serpentine is a silicate of magnesia, and limestone is carbonate of lime. Serpentine marble is composed of a series of alternate laminæ of carbonate of lime and green serpentine. The existence of this regular structure and this alternation of carbonate of lime and of serpentine impressed upon Sir William Logan the belief that it had an organic origin; but for a long time no specimens were found that yielded any evidence of this origin. About six or seven years ago, however, specimens were found which were examined by my friend Dr. Dawson, Principal of M'Gill College, Montreal, a most excellent microscopist and palæontologist. He had a knowledge of my own researches in foraminifera, and was well acquainted with the treatise which I published on this subject some years ago, and I had chanced to send him a year or two previously some of my own sections and microscopic objects, which happened to be just what was required to give him the clue to the interpretation of these stratifications. In making sections of this stratum, he found distinct evidence in the calcareous layers of shelly structure. Here is a diagram, showing what the structure would be if it were possible to dissolve out the serpentine, and leave only the calcareous layers. It has just the appearance of nummulites, with curious extensions into the solid layers between them, and these extensions are filled with prolongations of internal serpentine. In another diagram you see the ramifications of the serpentine which occupies these extensions. This is an ideal drawing, because we cannot dissolve away the serpentine and leave the carbonate of lime, but we can dissolve the carbonate of lime very easily and leave the serpentine. We thus get an internal cast or mould, showing the original form of the body which filled it.

The key to all this is furnished by the discovery which was made some years ago by Professor Ehrenberg, that the greensands of various geological periods are distinctly composed, in great part, of the internal casts of foraminifera. There, for instance, is the body of a *Globigerina*. Supposing that body, when dead and decaying, becomes entirely replaced by a green silicate; then dissolve away the *Globigerinæ*, and you will get a little mass exactly resembling the *Globigerinæ* in green silicate. That is exactly what is found in the green sandstone, and that process is going on at the present time. The examination of dredgings in different parts has shown that this process is going on at the bottom of the sea at the present time. Only a few months ago my friend Captain Spratt, who executed some years ago important dredgings in the Ægean Sea, placed in my hand some foraminiferous sand, and certainly the indications I saw in it led me to suspect that this change had taken place in many foraminifera. I put them into very dilute acid, and got a most perfect and beautiful series of internal casts, exactly corresponding with various forms which have already been found in the greensand. That gives the clue to the interpretation of this formation. We have a calcareous shell in the living state, with all the cavities filled with sarcode, and one chamber budding off from another continuously, not like the *Globigerina*, having a certain regular plan and then ceasing, but growing by continuous extension as corals do in making a coral reef. This chamber is filled with serpentine, which extends also into the minute peculiar cells which form what I call the nummuline layer. When we dissolve away the carbonate of lime, we leave here a set of little needles of serpentine, standing up side by side, or sometimes passing off into a brush-like form; and sometimes a smooth layer is formed by the smooth ends of the little fasciculi of silicate, just like the pile of velvet. But in particular parts we find that a number of these tubes run together and form pencil-like brushes that exactly correspond with what have been found in recent shells of the same kind. There is, in fact, no point in the structure of this *Eozoön*, which is so called, as indicating the dawn of life, which does not find its parallel in recent foraminifera. Having examined into the matter, I have come to the conclusion that Dr. Dawson was perfectly right in the view he had taken of the subject, and I was able, by having thinner and more perfect sections than he had, soon to determine the question of this nummuline layer, which completed the proof which was already all but perfect in my estimation. Still there are certain gentlemen who, from time to time, renew the discussion upon the matter when I am not present to reply to them, as was lately done at the Liverpool meeting of the British Association. Yet I venture to say that all the most eminent scientific authorities are fully satisfied with the view that was originally put forward by Dr. Dawson, and supported by myself, also by Mr. Parker, Mr. Rymer Jones, Mr. Brady, and all those who have most carefully examined it, and who are considered authorities on foraminiferous structure, and these views I have no question whatever will ultimately prevail. I may say, also, that those gentlemen who are the best authorities on the microscopic structure of minerals are entirely at one with us. Mr. Sorby, of Sheffield, who is by far the highest authority upon certain points of mineral structure, Mr. David Forbes, who is a great authority on the microscopic structure of minerals, and Mr. Maskelyne,—all say that this cannot be a mineral; that there is nothing that can account for the peculiar character that this structure shows that we know anything of in mineralogy, and there are certain facts which are quite inconsistent. I may just mention one of them, because I find it most satisfactory to any one who knows anything at all about the structure of minerals. It is this, that the Eozoön-rock shows, as many of them do, recent and fossil, distinct planes of crystalline cleavage. This has been long known. The spines of the *Cidaris* have a distinct crystalline axis; in fact, there is sometimes great difficulty in sawing them across, because the least turn of the saw will cause it to splinter off by crystalline cleavage. It has never happened to myself, but I am informed that many of the bags of gall-nuts which are sent over from the Levant very often contain a number of the curious large club-shaped fossil spines of the *Cidaris*, being put in fraudulently to add to the weight. Any of you who come across any of these curious fossils will find that you can cleave them in the proper direction, like a piece of calcareous spar; yet, nevertheless, they have a most beautiful and elaborate organic structure. The existence of crystallization has led many persons into the mistake of thinking that the structure of this rock cannot possibly be organic. There can, however, be no greater mistake, for we are constantly finding crystalline structure in recent as well as fossil calcareous organisms, and these large spines of the fossil *Cidaris* cleave very readily. The point is this: it is maintained by Messrs. King and Rowney that this beautiful arborescent structure, which is a magnified view of what would fill these canals,—that this, which we get by dissolving away the carbonate of lime, consists of mere mineral infiltrations. Now, the fact that was first pointed out to me by Mr. Jordan, I have found most particularly satisfactory to every gentleman who has gone into the question, and who is enough of a mineralogist to appreciate its importance. It is this, that these ramifications pass across the planes of cleavage, which they would not do if they were mineral infiltrations. I believe every mineralogist will at once say that that is perfectly conclusive against their being by any possibility mere inorganic infiltrations; that nothing but organic structure could in this manner produce a ramification of one mineral in the interior of another, a ramification of serpentine in the interior of carbonate of lime passing against its crystalline plane.

This cursory notice of this remarkable rock, for it covers hundreds of square miles in the Laurentian district, must conclude the little sketch I have endeavoured to give you this evening of the chief points of interest with regard to the structure of the foraminifera, but I may just mention one little incident which may give it a special interest for you, if, as I hope, I may be successful in inoculating some of you with a taste for microscopic study. If any of you are disposed to begin the study of the foraminifera, and will get the sponge merchants to give you the sand that they shake out of the sponges when these come over, you will find an immense variety of foraminifera, which will give you plenty of occupation; and there is nothing more easy to begin upon than this sponge sand. The incident I am about to relate I do not mention with any view to the *cui bono?* or with an idea of helping you to raise yourselves in life, because I do not think raising oneself in life is at all the first object in existence; I think the cultivation of one's own powers is the first object. However, to my tale. Some years ago, when I was first paying attention to this subject, a friend asked me if I knew Mr. A. B., who was at work on the same subject. I had not heard of Mr. A. B., who was a hard-working general practitioner, who had what is known as a guinea midwifery practice in a suburb of London. However, I called on this gentleman, and found him an enthusiastic student of natural history, but at the same time he was thoroughly and honestly devoted to his profession. I found that he had made a large collection of foraminifera in the manner I have mentioned, by getting the sponge merchants to allow him to shake out the sand which the sponges generally contain; and he had also gone down to Ratcliff Highway, and got the wholesale dealers in shells to allow him to scrape off some of the foraminifera which attach themselves to the large foliated shells of the East Indian seas, and which often afford some very curious types. In this way he had been working most patiently, employing every spare five minutes of his time; but I found he had been working on what I considered an entirely wrong basis. That is to say, he was following the then most recent authority, that of D'Orbigny, who was making every different form a species. Here, for instance, are two varieties represented, which are now classed as the same species, but which were then called distinct genera. We have now a perfect gradation from one to the other, so that it is impossible to draw a line between them. I invited him to spend an evening with me, and go through one type, and at the close of our interview he acknowledged that he had been working on a wrong plan, and said he should in future follow out the ideas I had given him. Since that time he has been one of my most valued and esteemed *collaborateurs;* and not only has he worked in the most successful manner upon this particular group, but he has followed another study requiring great devotion and care, and great dexterity of manipulation. He has since, through the valuable series of observations which he has communicated to scientific societies, been elected, and on his very first application, a Fellow of the Royal Society,—a distinction of very high value, because only fifteen are elected every year from forty-five or fifty candidates; and in the first or second year afterwards he received the gold medal, one of the highest honours the Royal Society can bestow. I am glad also to be able to say that that scientific distinction, instead of injuring him in his profession, has been of essential service to him. I mention this to show you how, from a very humble beginning, a man may, by simply employing odds and ends of time,—for my friend never had an idle five minutes in the day,—attain to a high position in science. There is no position in life in which this study may not be pursued; and it affords an object of interest, which is one of the greatest comforts to any man of active and busy life,—the comfort of turning to something which forms a quiet occupation at once engaging the eye and the mind without any effort, and which tends more than anything else to distract one from the cares and fatigues of this busy London life, which all of us more or less are engaged in. I can assure you, from my own experience, that microscopic study is for this purpose the best kind of recreation I am acquainted with.

Over-doses of Chloral Hydrate.—*The Medical Times and Gazette* mentions several cases which tend to show that chloral hydrate may prove fatal when administered in too large a dose. One, taken from the *New York Journal of Psychological Medicine*, was that of a lady, exceedingly nervous, who had been subjected unavailingly to a great variety of treatment. At last chloral hydrate was given in six cumulative doses of thirty grains each. The sleep so induced, although every effort was made to arouse her, ended in death. The cerebral vessels were enormously congested. The patient had previously been taking bromide of potassium. In one of our metropolitan hospitals a fatal issue has followed the administration of a large dose of chloral; but here the patient was in an exhausted state from a severe operation. In Philadelphia a woman swallowed an enormous quantity of the drug (460 grains it is believed). The symptoms were very severe, but remedies being applied promptly she recovered.

DR. RICHARDSON ON CHLORAL HYDRATE.

Dr. Richardson, in his lecture on Tuesday last, opened with a short and special series of observations on the recent fatal or assumed fatal cases from the use of the hydrate of chloral, and discussed certain important questions in respect to the action and the effects of chloral, on which he had recently been consulted by members of the medical profession. To a first question whether the practice of taking the hydrate without medical advice or direction was becoming at all general amongst the public, he gave a direct affirmative answer. He held that, in professional hands, now that its action is better understood and the novelty of its application has worn off, the employment of the hydrate is less than it was some months ago; while the practice of resorting to it by the public is on the increase, and a new class of cases is thereby becoming known, marked by particular symptoms and assuming, in some instances, a serious character.

As showing the extent to which the hydrate is now employed, Dr. Richardson said he had been able to estimate that nearly 50 tons of the agent had been used in England in the last eighteen months.

On the question, what is a dangerous and what a fatal dose of the hydrate, the lecturer computed that 120 grains was a dangerous and 180 grains a fatal dose; he cited a case of recovery from a dose of 120 grains, but the symptoms were very prolonged and the risk great.

Another question related to the quantity of the hydrate that might be given in small and repeated doses during a limited time, say of twenty-four hours. The answer to this was, that an adult person could not decompose and eliminate more than from five to seven grains of the hydrate per hour, and that it was therefore not prudent to administer more than 120 grains in the time suggested, viz. twenty-four hours. On a fourth question, whether the frequent administration of hydrate of chloral lessened or increased the danger of administration, the argument ran to the effect that frequency of administration, while it might increase the confidence of those who took the drug, in respect to its safety, actually increased the danger. To use a technical phrase, there was danger by frequent repetition of "accumulation," while the power of the body to dispose of the agent by diffusion, decomposition and elimination, became sensibly reduced. A striking contrast was here struck between the actions of opium and hydrate of chloral, by which it was shown that the latter cannot, like the former, be gradually increased except in the most limited degree, without immediate danger. Three other questions were noticed at length, having reference to the symptoms and pathological conditions incident to the prolonged use of the hydrate; the chemical tests for it in the tissues in cases of poisoning by it, and the *post-mortem* appearances in cases where it proved fatal after administration in many successive doses. These points, which excited much interest in an audience, composed almost exclusively of medical men, are of less moment to our own readers than the subjects we have briefly noticed above.

It will be recollected that Dr. Richardson was the first physician in England who experimented and reported on the action of chloral hydrate, after Liebreich's discovery of its properties, his report having been prepared at the request of the biological section of the British Association for the Advancement of Science, and read at the Annual Meeting of the Association at Exeter, in 1869.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Annual Dinner of the above Society was held on Wednesday evening, Jan. 25th, at the Crown and Sceptre Hotel, and was numerously attended by the members. The chair was occupied by the President, W. Thompson, Esq., and Mr. Harrison Thompson filled the vice-chair.

As the meeting was intended to partake more of a social than a business character, the only toast proposed was by the Chairman, who said he ought not to let that opportunity pass of publicly thanking Messrs. Nicholson and Sharp, and the other gentlemen, whether present or absent, who had devoted a considerable amount of time and labour to getting up lectures and readings, and arranging the business of the society, not forgetting their Treasurer, Mr. Robinson, whose duties were, perhaps, the most onerous of all. These gentlemen responded, speaking hopefully of the progress of the society, Mr. Sharp stating that the last meeting had been undoubtedly the best attended and most successful of any that had been held.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Annual Supper of the members of this Association was held at the Wellington Hotel, Granby Street, on Thursday night last. The chair was occupied by Mr. J. W. Clark, the vice-chair being filled by Mr. F. Parsons. After the usual toasts,

Mr. Nettleship proposed the toast of the evening, "Success to the Chemists' Assistants and Apprentices' Association." He was pleased to think that the young men of this town had formed themselves into a Society for the advancement of their knowledge in chemistry and pharmacy. Thirty or forty years ago, persons engaged in those pursuits had to rely mainly upon their own resources to attain a certain degree of learning, but at the present time similar societies to theirs were instrumental in enabling young men to successfully pass the examinations of the Pharmaceutical Society. He believed there was no kingdom in the world where chemistry and pharmacy were so satisfactorily carried on as in Great Britain, and expressed his belief that unfounded prejudices which had existed in the public mind respecting chemists' inefficiency in the admixture of medicines would, ere long, cease to exist. He hoped the society would continue to flourish, and requested them, in connection with the toast, to drink to the health of Mr. Young, the President.

Mr. Young, in responding, said few associations could boast of greater success than the one of which they were celebrating the anniversary that night. Since their last annual meeting fourteen or fifteen members of the society had, in different grades, passed examinations of the Pharmaceutical Society.

The Vice-President then gave "Prosperity to the Pharmaceutical Society of Great Britain." He thought they would all admit that they had received great benefit from that Society, and would readily acknowledge the influence it had exercised in promoting the welfare of the chemists and druggists throughout the United Kingdom.

Mr. Clark responded. He said he considered the Pharmaceutical Society had conferred a vast amount of good upon the chemists and druggists of Great Britain, and thought it highly probable that it would eventually raise their position to one of considerable importance.

Mr. Young then proposed "The Honorary Members," associating with the toast the name of Mr. Clark, their chairman upon that occasion.

In responding, the Chairman remarked that two generations ago there were but three chemists in the town of Leicester, while at the present time their number exceeded forty. He hoped the Association would increase in prosperity and usefulness.

Several other toasts were given and responded to, including "The Committee," "The Chairman," "The President, Mr. Young," and "The Local Secretary of the Pharmaceutical Society, Mr. T. Cooper."

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 11, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PROPOSED POISON REGULATIONS.

We are glad to call attention to the circular just issued to the members of the Pharmaceutical Society by its Council, a copy of which will be found in the minutes published this week*—because it is of great importance that the whole question should be thoroughly ventilated before the Annual Meeting, that the members generally should know what regulations they are asked to enact, and that the Council and its present position on the question should be fairly understood. Much misconception has undoubtedly existed both as to the regulations themselves and as to the motives urging the Council to propose them. Men who take the responsibility of public duties must be content occasionally to bear the shade of displeasure, but we think it natural that the Council should endeavour, as they do in this circular, to cast off the imputation of having, in mere servile deference to the Privy Council, sacrificed the liberty of the body to which they belong. It would be extraordinary that they should do so, seeing their daily avocations are similar to those of chemists generally, and whatever would affect or annoy the one would act in like manner on the other.

CHLORAL HYDRATE.

Dr. Richardson's remarks on the use of chloral hydrate, given on the preceding page, will doubtless be read with great interest, and they are calculated to serve as a wholesome warning against the abuse of this valuable agent.

We may take the opportunity of stating that the low results sometimes obtained in testing chloral hydrate appear to be, in a great measure at least, due to the moist condition of the samples. The hydrate is exceedingly hygroscopic, especially when in the form of amorphous cake, and this circumstance seems to be an additional reason why the hard, rhomboidal crystals should be preferred for dispensing. It appears to be doubtful whether the alcoholate is being, to any large extent, if at all, used in the place of the hydrate.

We have received from Messrs. Schœtensack—too late for insertion—a letter containing the results of an analysis of the chloral hydrate manufactured by Saame, of Göttingen, and a copy of a certificate signed by Professor Wöhler, that the material analysed gave the due yield of chloroform. We have also found this to be the case with specimens of chloral hydrate stated to be of Saame's manufacture, and with samples obtained direct from Messrs. De Haen, through their agents, Domeier and Co. But by exposure to the air and absorption of moisture, there will often be a very large reduction in the amount of chloroform obtained in testing.

Mr. W. Beynon, who for nearly two years has filled the office of Honorary Secretary to the London Chemists' Association, has, much to the regret of the members, sent in his resignation, in consequence of not having sufficient spare time to attend to its duties. Mr. J. H. Jessop has been appointed as his successor.

The death of Dr. Sheridan Muspratt is announced as having taken place on Friday last, at his residence, The Hollies, Stoneycroft, West Derby, after a lingering illness. The deceased gentleman was fifty years of age.

Her Majesty has directed that a pension on the Civil List of £100 per annum should be given to Dr. Stenhouse, "in consideration of his scientific attainments."

It is announced that in connection with the *Milk Journal* a laboratory is to be fitted up and placed under the charge of Mr. J. A. Wanklyn, for the institution of original researches into the best methods of testing milk.

The Liverpool Chemists' Association held its eleventh Conversazione, on Thursday, the 2nd inst., at the Royal Institution, Colquitt Street. It was very numerously attended. In the course of the evening Professor Roscoe delivered a very interesting lecture, illustrated by experiments, on "Solar Chemistry."

We observe that it is stated in the *Canadian Journal of Pharmacy* for January, which we have just received, that the prosecution of the twenty-five Toronto druggists for the illegal sale of poisons* has resulted in a conviction, and a fine of twenty-five dollars each and costs. It is intended to carry the matter before a higher Court.

* See page 653.

* See *ante*, No. 28, p. 547.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

February 1st, 1871.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Atherton, Bottle, Bourdas, Carr, Deane, Dymond, Edwards, Evans, Groves, Hills, Savage, Stoddart, Sutton, Williams and Woolley.

The minutes of the last meeting were read and confirmed.

The Lot for the next Council having been taken in the usual manner, the following were declared to go out of office, but are eligible for re-election:—*

ABRAHAM, JOHN, 87, Bold Street, Liverpool.
ATHERTON, JOHN HENRY, Long Row, Nottingham.
BOURDAS, ISAIAH, 7, Pont Street, Belgrave Square, London, S.W.
BROWN, WILLIAM SCOTT, 113, Market Street, Manchester.
CARR, JOHN, 171, High Holborn, London, W.C.
DEANE, HENRY, Clapham Common, Surrey.
DYMOND, GEORGE, 17, Bull Street, Birmingham.
EVANS, HENRY SUGDEN, 60, Bartholomew Close, London, E.C.
HASELDEN, ADOLPHUS F., 18, Conduit Street, Bond Street, London, W.
HILLS, THOMAS HYDE, 338, Oxford Street, London, W.
MACKAY, JOHN, 119, George Street, Edinburgh.
SANDFORD, GEORGE WEBB, 47, Piccadilly, London, W.
WILLIAMS, JOHN, 5, New Cavendish Street, London, W.
WOOLLEY, GEORGE STEPHEN, 69, Market Street, Manchester.

The following Members were declared to remain in office for the ensuing year:—

BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
EDWARDS, GEORGE, Dartford.
GROVES, THOMAS B., Weymouth.
REYNOLDS, RICHARD, 13, Briggate, Leeds.
SAVAGE, WILLIAM DAWSON, 30, Upper Bedford Street, Brighton.
STODDART, WILLIAM WALTER, 9, North Street, Bristol.
SUTTON, FRANCIS, 9, Bank Plain, Norwich.

The Report and recommendations of the Finance Committee were received and adopted.

In pursuance of notice given last month, it was moved by Mr. Haselden, seconded by Mr. Savage, and

Resolved unanimously—That an honorarium of one hundred pounds (one year's salary) be presented to Mr. John Barnard, as a recognition of his services in connection with the Journal during a period of fifteen years.

The Report of the Benevolent Fund Committee was received and adopted, and a grant of £5 was made to a Registered Chemist and Druggist, late of Leicester.

The Report and recommendations of the Library, Museum and Laboratory Committees of the 5th and 31st of January were received and adopted.

In reference to the recommendation of the Library, Museum and Laboratory Committee of December 8th, "That the publication of the proceedings of the Evening Meetings be deferred to the week following that in which the meeting is held," it was

Resolved—That the Report of Evening Meetings be published in the Journal of the following week, so as to allow of sufficient time for correction.

* Bye-laws, sect. 5, clause 3:—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing with the name and address of the nominee, and if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, on or before the 24th day of March in every year."

LIBRARY, MUSEUM AND LABORATORY AND PROVINCIAL EDUCATION COMMITTEE (acting conjointly).

The Committee reported that certain apparatus belonging to the Society might be lent to Provincial Associations, and a list of such apparatus was presented.

The Committee also presented a Code of Rules to be observed in the loan of such Apparatus, and recommended that it should be published with a list of the Apparatus in the Journal, and printed in a separate form for circulation.

Resolved—That the Report and recommendations of the Committee for the loan of Apparatus be received and adopted.

PROVINCIAL EDUCATION COMMITTEE.

The Committee reported that they had considered the applications of the Leicester Chemists' Assistants and Apprentices' Association and the Sheffield Pharmaceutical and Chemical Association, and recommend that Books, Diagrams, or other educational matter, to the value of £10, be granted to the Leicester Association, such materials to be considered the property of the Society, and to be held under guarantee, in accordance with the Regulations of the Standing Provincial Education Committee, the Leicester Association to furnish a list of the requirements costing the sum proposed.

The Committee also recommend that the Sheffield Association be informed that the Council express their willingness to assist in the collection of a Library, Diagrams, Apparatus, or other material in aid of Pharmaceutical Education, but that they do not recommend at present, in the case of towns possessing the educational advantages of Sheffield, that grants of money be given in aid of Lecture or Students' Fees.

Resolved—That the Report and Recommendations of the Provincial Education Committee be received and adopted.

Resolved—That any Association to whom grants on trust are made by the Pharmaceutical Society shall give as guarantors the names of three resident Pharmaceutical Chemists or members of the Society in business, or such other names as may be satisfactory to the Council.

POISON REGULATIONS.

Further Correspondence with the Privy Council.

[COPY.]

"*Medical Department of the Privy Council Office,*
"*January 17th*, 1871.

"Sir,—I am directed by the Lords of Her Majesty's Council to acknowledge the receipt of your letter of the 26th ult., enclosing a copy of some Regulations agreed to by the Council of the Pharmaceutical Society, and proposed to be submitted to the next Annual Meeting of the Society.

"My Lords, in considering the regulations in regard to the *keeping* of poisons, direct me to say that they are of opinion that some regulations as to the *sale and dispensing* of poisons are absolutely necessary for the public safety, and they therefore hope that your Society will, with the least possible delay, frame regulations on that subject, so that their Lordships may be able to give their consent to a complete body of regulations (such as the statute contemplates) in regard to the keeping, selling and dispensing of poisons.

"I am, Sir,
"Your obedient servant,
"(Signed) JOHN SIMON."

"*Medical Department of the Privy Council Office,*
"*8, Richmond Terrace, Whitehall, S.W.*
"*January* 21, 1871.

"Dear Sir,

"There are some alterations which the medical officer thinks should be made in the proposed regulations as to the *keeping* of poisons, and as it would apparently be well that you should be in possession of his views on these matters before the next meeting of your Council, he would be glad to have an opportunity of conferring with you some day next week, and would suggest Tuesday next, the 24th, at 3 o'clock. Please let me know whether you can come.

"Yours faithfully,
"W. ROTTON.

"The Registrar of the Pharmaceutical Society."

In compliance with this request the Registrar reported that he had, accompanied by the President, attended at the Privy Council Office.

The alterations which Mr. Simon considered necessary in the regulations as to the keeping of poisons were merely verbal, calculated to make their meaning more clear; but he most urgently desired that the regulations as to the dispensing of poisons, which he deemed of vital importance to the public safety, should be restored.

The following is the form in which Mr. Simon thought the regulations should be remodelled:—

Proposed Regulations as to the Keeping and Dispensing of Poisons.

1. In the keeping of poisons each bottle, vessel, box or package containing a poison shall be labelled with the name of the article, and also with some distinctive mark indicating that it is poison.

2. Also in the keeping of poisons, each poison shall be kept on one or other of the following systems, viz.

(*a*) in a bottle or vessel tied over, capped, locked or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop or dispensary; or

(*b*) in a bottle or vessel readily distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop or dispensary; or

(*c*) in a bottle, vessel, box or package kept in a room or cupboard set apart for dangerous articles.

3. All liniments, embrocations, and lotions containing poison shall be sent out in bottles readily distinguishable by touch from ordinary medicine bottles, and there shall also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

Resolved—That the proposed Regulations as to the keeping and dispensing of Poisons now presented be received and entered on the minutes.

Moved by Mr. Sutton, seconded by Mr. Woolley,

That the discussion on the second letter of Mr. Simon, and upon the proposed Poison Regulations generally, be postponed to the 1st of March.

For the motion (5)—

Messrs. Atherton, Carr, Savage, Sutton and Woolley.

Against (10)—

Messrs. Bourdas, Deane, Dymond, Edwards, Evans, Groves, Haselden, Hills, Sandford and Williams.

The motion was therefore lost.

Moved by Mr. Dymond, seconded by Mr. Deane,

That though the adoption of the proposed Regulations for the Keeping, Sale, and Dispensing of Poisons rests with the Annual Meeting of the Pharmaceutical Society, yet inasmuch as they will affect a large number of the members to whom it will be impracticable to attend that meeting, and as it is necessary that the subject should, if possible, obtain a final settlement, it is desirable that the Regulations, as now submitted by the Council, be sent to each Member of the Pharmaceutical Society, together with a statement of the reasons which have induced the Council to suggest them.

For the Motion (11)—

Messrs. Bottle, Bourdas, Deane, Dymond, Edwards, Evans, Groves, Haselden, Hills, Sandford and Stoddart.

Against (2)—

Messrs. Sutton and Woolley.

The Motion was therefore carried.

In pursuance of the above resolution, a statement of reasons was submitted to the Council, and a Committee, consisting of the President, Vice-President, Messrs. Deane, Dymond and Edwards, was appointed to revise and issue it.

The Committee subsequently met and instructed the Secretary to send a Copy of the following Circular to each Member of the Society and to each Associate of the Society in business:—

A Statement of the Reasons which have Induced the Council to Suggest Regulations regarding the Keeping, Dispensing and Selling of Poisons.

The Council of the Pharmaceutical Society, feeling it to be of primary importance that the question of the adoption of regulations for the keeping and dispensing of poisons should receive early and definite settlement, earnestly desire to call the serious attention of the members generally to it, with a view to its receiving their final judgment at the ensuing Annual Meeting in May.

The course of legislation on the subject of poisons is one which many members of the Council have, in their official capacity, carefully watched for many years. Prior to the passing of the Pharmacy Act of 1868 attempts had been made in Parliament at various times to enforce regulations for the sale of poisons (of which the Act regulating the sale of arsenic is an illustration), and it is due to the Council of the Pharmaceutical Society to say that, but for their vigilance, measures which would have proved most injurious to the true interests of chemists, and of the public, would in all probability have passed the Houses of Parliament and become law. The desire of the Council has always been, whilst, on the one hand, conscious of the just claims of the public on those who are the responsible dealers in dangerous poisons, on the other hand, to restrict legislation on this subject to those moderate and practical measures which they knew to be in accordance with the exigencies of the trade. They venture to think that their efforts in this direction have not been devoid of success.

The history of the Pharmacy Act of 1868 is well known. When, in 1865, the Council of the Pharmaceutical Society, encouraged by public opinion (but more especially by the opinion of the medical profession), that dispensers of medicine should be an educated class of men, introduced their "Bill to regulate the Qualifications of Chemists and Druggists," it contained no allusion to poisons whatever. There is every reason to believe that Bill would have passed had not a second, emanating from the United Society of Chemists and Druggists, led the Government to infer that we were not agreed as to the best course to pursue. In the Bill of the United Society poison clauses were prominently introduced, and a Committee of the House of Commons reported that it was desirable to legislate on that subject.

The Council, therefore, were compelled to accept the regulation of the sale of poisons as one basis of future legislation, or forego their efforts to extend the Pharmacy Act. They drafted a Bill accordingly, for which they obtained the approval of Government, but, owing to the great pressure of public business, could not get it introduced as a Government measure. Fortunately, Earl Granville took charge of this Bill, passed it readily through the House of Lords, and Mr. Headlam ably stood sponsor for it in the Commons. There, however, a much more severe treatment was in store for it. Propositions were made to render the poison clauses so restrictive that, had they passed into law, the trade of a chemist and druggist would have become almost impossible. These propositions were watched and combated from day to day by the Council, and the Act of 1868 was the result. In that Act great privileges were accorded to, and great confidence reposed in, the Pharmaceutical Society, to which, on the urgent representation of the Council, that the Society itself was the only competent judge of what would be practicable and adapted to the various exigencies of trade in all parts of the kingdom, the Legislature committed the duty of arranging the detailed conditions for keeping, dispensing, and selling poisons.

Hence there was a tacit understanding between the Council and the Government that the Pharmaceutical Council should frame a code of regulations to be approved by the Privy Council. It became the duty of the Society to do that which in its wisdom should be consistent with this understanding,—to frame a series of regulations for the keeping, sale, and dispensing of poisons which should be practicable and easy of application to chemists and druggists, and, at the same time, satisfy the demands of Parliament and the public.

In doing this, the Council felt it would be impossible to prepare regulations which would not interfere, more or less, with the existing arrangements of many chemists. But they thought if regulations could be framed which would be neither onerous nor impracticable, every chemist would feel it his duty to submit to some inconvenience, if necessary, to promote the public safety, for the sake of unanimity, the general good, and the satisfaction of the Government.

In framing resolutions, the Council have been most solicitous not to interfere prematurely with the subject, or to encumber chemists generally with any burdensome restrictions in the conduct of their responsible duties; but at the commencement of 1870 they felt the subject could not be delayed, and at that time proposed a series of regulations for the "keeping, selling, and dispensing of poisons." That scheme was presented to the Annual Meeting in May last. It obtained much attention previously to and at that meeting, and though an amendment was moved directly negativing the proposal, a resolution was unanimously passed in the following terms:—"That the subject be taken into consideration by the incoming Council, and that a further report be made to the next Annual Meeting."

During the interval which has elapsed since that time, the subject has obtained the frequent and anxious attention of the Council. They have carefully observed the current of opinion on the subject amongst the members of the Pharmaceutical Society, as shown in the periodical correspondence upon it, and in the memorials which have been received from various Pharmaceutical Associations in the country. They have also watched the expression of opinion in the press, and have been fully informed of the views entertained by the Privy Council and by members of the Legislature. Considering also the obligations which the passing of the Pharmacy Act of 1868 has imposed upon them, they believe it their duty still to propose the same rules for the *keeping of poisons* (though in a simplified form) which they proposed last year, as those which appear to afford on the whole the most scope and simplicity, and which are best suited to the various necessities of chemists in business. They, however, omitted the third proposed regulation for the "dispensing of poisons,"—not because they considered it inappropriate, but in the endeavour to meet the views of members of the Society by disencumbering the proposed regulations of what seemed to be the least important of them.

Since the meeting of Council at which these amended regulations were agreed upon, the Registrar of the Pharmaceutical Society has received two communications from the Privy Council, of which no member of the Council had any previous cognizance. The first of these expressed a desire to know whether the Pharmaceutical Society intended within any specified time to propose such regulations as Parliament, in the opinion of the Privy Council, required. The reply of the Registrar to this inquiry, enclosing the proposed amended regulations, produced another letter from the Privy Council expressing the opinion that some regulation as to the *sale and dispensing* of poisons, "*such as the State contemplated*," were absolutely necessary for the public safety, as well as those for the *keeping* of poisons. (*Vide* 'Minutes of Council,' February 1st, 1871.)

This letter has induced the Council of the Pharmaceutical Society to reconsider the whole question, and the decision at which they have arrived is that it will be incumbent on them to present to the Annual Meeting in May next for its approval, regulations as to the *dispensing*, as well as *keeping* of poisons.

In this decision the Council have not been unmindful of the objections which have been raised, which, however, have been directed more to the imposition of any regulations at all, than to the impracticability of those particularly which the Council propose. The language in which the regulations are couched is so simple that it would appear almost superfluous to explain further, but the Council have been struck by the erroneous interpretations which have from time to time been given. Notably, it has been stated over and over again, that it would be impossible to keep all poisons in one cupboard. The regulations do not contemplate anything of the sort. A chemist may adopt the separate system for one, or as many poisons as he pleases; he may keep others on the ordinary shelves of the shop, provided either that the bottles or vessels containing them be distinguished by some peculiarity of shape, roughened surface, or leather or other cap. It is admitted that very many, probably most, chemists in Great Britain, already adopt them in some or all of their forms. So far, their importance and value are admitted. It appears to the Council one of the strongest arguments in their favour, that so many actually feel it to be a *duty* as well as a *necessity* to adopt them. Some of the objections raised are such as the Council find it difficult to take cognizance of; but with reference to the obligations which the regulations would impose, they venture to say that no vexatious proceedings will be adopted to inquire into their observance. They believe some practical advantages will follow the adoption of them, in the lessening of anxiety in the conduct of so responsible a business, and in the probable mitigation of penalties in case of accidents. They think it not unreasonable that in private and public dispensaries the same regulations as to the keeping and dispensing of poisons should be enforced, but the necessity of their observance by chemists is not affected thereby, whilst it is well known that the great bulk of poisonous drugs is deposited with, and is used by, the chemist. The Council are not without sympathy with those who feel objections to the imposition of any restrictions, however slight, in the conduct of any portion of their business; but, for the reasons before stated, they believe that the concessions which chemists are now asked to make are such as it would be wise and prudent for them to yield, whilst there is every reason to believe that the regulations now framed will fully satisfy the requirements of the Legislature.

REPORTS OF THE BOARDS OF EXAMINERS.

January, 1871.

England and Wales.

	Candidates examined.	Candidates passed.	Candidates failed.
January 18, Major	4	4	0
,, ,, Minor	16	15	1
,, 2, Preliminary	298	210	88
	318	229	89

Preliminary Examination.—4 Certificates approved.

SCOTLAND.

	Candidates examined.	Candidates passed.	Candidates failed.
January 17, Minor	8	5	3
" " Modified	5	4	1
" " Preliminary	11	10	1
	24	19	5

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Diaper, Albert .... Bury St. Edmund's.
Reinhardt, William Tynedale .. Leeds.
Sandiland, Robert Burgess, jun. Bicester.
Sherburn, Thomas .... Harrogate.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be elected Members:—

Butterworth, Albert .... Bradford.
Cross, William Gowen, jun. .. Shrewsbury.
Griffin, Thomas .... Boro' Fen, Peterborough.
Peck, Frederick Hamilton .... London.
Perry, William Henry ...... Birmingham.
Raffle, William .... South Shields.
Reinhardt, William Tynedale... Leeds.
Robinson, James .... Darlington.
Sandiland, Robert Burgess, jun. Bicester.
Scruby, William Yull .... London.
Shaw, Henry Woolhouse .... Doncaster.
Skipper, Edward .... London.

Resolved—That the following Registered Chemists and Druggists be elected Members of this Society:—

Arnold, Spencer .... Tunbridge Wells.
Ellis, William .... Burnham.
Ferneley, Charles .... Worcester.
Lewis, Thomas Hopkin ...... London.
MacGeorge, William .... London.
Pipe, Walter .... London.
Rutter, Edmund Yates .... London.
Tully, John .... East Grinstead.
Watson, Gilbert Pickering .... Norwich.
Williams, William .... Tenby.
Wovenden, Henry .... Sale.

Resolved—That the following, having passed their respective examinations, be elected "Associates in Business":—

MINOR.

Brooks, Frederick .... Hastings.
Budden, William .... Liverpool.
James, John .... Liverpool.
Osborne, James .... Ashbourne.
Part, Edward James .... Greenwich.

MODIFIED.

Cottrill, John White .... London.
Hughes, Jacob .... Llanelly.
Light, John Henry .... Bristol.
Oldham, Gervase .... Macclesfield.
Palethorpe, William .... Bingham.
Parnell, James .... Wiveliscombe.
Preston, Alfred Prince .... Abingdon.
Pughe, Rice Owen .... Pwllheli.
Rainforth, Richard .... Sheffield.
Rogers, Henry Frost .... London.
Smith, Allen .... Sale, nr. Manchester.

Resolved—That the following, having passed their respective examinations, be elected Associates:—

MINOR.

Arundel, Matthew Henry ..... Penge.
Bannard, Henry .... Brackley.
Brown, James .... Bideford.
Coles, Samuel John .... Brentford.
Freeman, Ernest .... Stourbridge.
Galloway, George, jun. ...... Inverness.
Hadley, Thomas .... Hereford.
Jones, Alfred .... Northampton.
Macpherson, Richard .... Greenock.
Overton, Charles Arthur ...... Horncastle.
Sant, George .... Atherstone.
Slater, Jonathan .... Keswick.
Smith, John Francis .... Scarborough.
Strachan, Alexander .... Aberdeen.
Wright, Joseph .... Knutsford.

MODIFIED.

Bowler, William Samuel ...... Ashbourne.
Collett, Charles Benjamin .... London.
Morris, John Cape Bevan .... Brecon.
Moule, William .... Bristol.
Sugden, Joseph William ...... High Harrogate.
Yoxall, Henry .... Belfast.

Resolved—That the following be appointed Local Secretaries to the Society:—

Aberdare ...... T. W. Evans *vice* J. Jones, resigned.
Wakefield .... John Taylor " T. W. Gissing, dead.
Gt. Yarmouth .. John Jas. Owles " W. S. Poll, resigned.

PHARMACEUTICAL MEETING.

Wednesday, February 1st.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The first of two Lectures on the Microscope and its Revelations was delivered by W. B. CARPENTER, M.D., F.R.S., F.G.S., F.L.S., which will be found printed at p. 641. At the close a vote of thanks to the lecturer was passed unanimously.

MEETING AT EDINBURGH.

The Third Meeting of the present Session of the North British Branch of the Pharmaceutical Society was held in St. George's Hall on Friday Evening, 3rd February; Mr. AITKEN, President, in the chair.

Professor ARCHER made the following communication on "Isinglass":—

In commencing this paper I beg it to be understood that in this, and similar efforts, my object is not to produce original matter for the instruction of the senior members of this Association, but to draw the attention of the juniors to those subjects of interest in which their profession abounds, and which simply require to be presented to their notice, to be appreciated as steps in the acquisition of that knowledge which is to become the foundation for their future success in life.

Last winter I called attention to a series of animal substances which hold a very interesting position in the history of pharmacy; but I purposely left out the important subject of my present paper, because it was impossible to do justice to it in the general summary which I then presented to your notice.

Isinglass, under its Greek name, Ichthyocolla (from ἰχθὺς a fish, and κόλλα glue) was known in the time of Dioscorides, who, however, says but little about it. Pliny, who wrote about fifty years later, that is, at the commencement of the Christian era, describes it as the production of a fish *called* ichthyocolla. In this he was doubtless mistaken, and he evidently knew little of its history, for he says, "Ichthyocolla is the name of a fish with a glutinous skin; the glue which is made from it is also known by the same name." He further says, "That of Pontus is highly esteemed, it is white, free from scales, and dissolves with the greatest rapidity." This proves incontestably, first, that the Greeks obtained it from the Black and Caspian Seas, as the Russians do at the present day; and, secondly, that, besides this imported isinglass, the Romans had found that certain fish-skins yielded an inferior but still useful kind of fish-glue.

Isinglass (supposed to be derived from *Hausenblase*, or sturgeon's bladder) is generally understood to be the air-bladders of certain fishes carefully prepared by drying; but it is the gelatine which these organs contain in such abundance and purity which is the valuable part for food purposes; and this is obtainable, though less easily, and of less purity from the skin, the membranes of the stomach and other integuments of the same, and many other kinds of fish. This particular kind of gelatine has two principal uses; first, as an article of food, and secondly, as a means of clarifying various preparations, especially fermented liquors; to these may be added its use as a cementing material, which, however, is not very important.

As an article of food only the finer kinds of Russian isinglass are generally used; these are obtained from various species of the genus *Acipenser* (Family, *Sturionidæ*), viz.:—

Acipenser Huso (Linn.). The Beluga.

A. Guldenstadtii (Brandt and Ratzeburg). The Osseter.

A. Ruthenius (Linn.). The Sterlet.

A. stellatus (Pallas). The Sewruga.

These are all natives of the Caspian and Black Seas, and are chiefly caught in the rivers flowing into these seas, the Volga especially. The more common species of *Acipenser*, *A. sturio*, the sturgeon which is found widely distributed not only in the rivers of Europe but also in those of North America, has not been used for obtaining isinglass, because, I presume, it is never found in great numbers in the European rivers. Professor Owen in 1851 called the attention of the Canadians to the fact that the sturgeon abounds in the large rivers of North America, and suggested the utilization of their isinglass, which has been since collected, although not in very great quantities.

One other fish is known to be taken by the Russian isinglass traders, namely, the *Silurus glanis*, a large fish which is supposed to yield the Samovy isinglass of commerce.

The preparation of isinglass, whether for the purposes of food or otherwise, is the same. I will therefore say a few words upon the process employed by the fishers. The air-bladders, when removed from the fishes, are usually slit open or turned inside out, well washed, and the inner membrane, which has a silvery lustre and greater consistency than the outer one, is stripped off to form the finest qualities, or left on as the case may be. The air-bags are then carefully dried in various ways; thus, by some curers they are slit open and spread out to dry, by others they are stretched between pegs giving the staple form, as seen by these specimens, whilst others fold the opened sheets so as to form these specimens of book-isinglass. The Brazilian and Indian methods, probably from the fact that drying is a much easier process in those warm climates, are of a much more simple character.

Of Brazilian there are two kinds, lump and pipe. The *lump* is the collapsed air-bladder, flattened and dried; the *pipe* kind appears to have been dried with air in it, so as to distend it and allow the inner membrane to dry thoroughly.

There are three kinds of Indian; lump, leaf and pipe.

When isinglass is imported it has to be prepared for use by first softening it by moisture, then rolling it into thin sheets between powerful metal rollers, after which it is cut into fine shreds. Before these mechanical appliances were thought of, it was rudely prepared by cutting it into pieces and then pulling these pieces into small shreds by the fingers, or cutting into thin pieces by knives.

As a clarifying material its use is very extensive amongst brewers; it is also used in clearing some kinds of wine and other liquids, but its exact operation is not quite understood. By some it is believed that as the gelatine dissolves in the liquids to be cleared, it spreads in thin, net-like films, which gradually sink and carry down with them the suspended impurities. Others believe that the thin shreds of the isinglass contain net-like membranes, which as the gelatine dissolves out, are left expanded in the fluid, and, as they sink, carry down the impurities as in the other case. The latter is most likely the mode by which it operates, because it is quite certain that a solution of the pure gelatine of isinglass will not produce the same effect, neither some kinds of fish-sounds, prepared as isinglass, which are from time to time tried for this purpose.

Of the substances allied to isinglass which are found in commerce I may mention the—

Cod-sounds, which are the air-bladders of the cod; they are salted and not usually dried, and are only used for food; they come to us from the cod-fisheries of our own country and Newfoundland.

Fish-maws, which are the stomachs of certain fishes caught on the shores of India and the Indian islands; they are dried and form an important article of commerce to China, Japan and other Eastern countries. We have no reliable information as to the fishes which yield them.

Sharks' fins and skin, in consequence of the large amount of gelatine they contain, also form an important trade with the same nations.

Visiaga, the curious article I now show you, forms one of the greatest delicacies of the Russian *cuisine*. It consists of the long tendons which lie along the vertebral column of the various species of sturgeon, from which it is separated, dried over lines, and tied up in bundles for sale. When used, it is soaked until soft, cut into lengths of about an inch, and made with rice and some condiments into very delicious pies, which, however, from their costliness, are only found at the tables of the wealthy.

On the table I have placed specimens of Indian and Siamese fish-maws, shark's skin and fins, viziaga, and the following kinds of isinglass:—

1. Russian.
   - Beluga Leaf, from *Acipenser Huso*.
   - Astracan Leaf, from ditto.
   - Short Staple, from *A. Guldenstadtii*.
   - Siberian Purse.
   - Samovy Leaf, } from *Silurus glanis*.
   - Samovy Book, }
   - Long Staple.
   - Short Staple.
   - Rolled.
   - Cut.
2. Brazilian.
   - Block or Cake, }
   - Lump, } Probably from *Silurus Parkerii*.
   - Purse, }
   - Tongue or Pipe, }
   - Rolled and Cut.
3. Guiana and West Indian.
   - Gilbacker lump (British Guiana), from *Silurus Parkerii*.
   - Ditto, cut.
   - French Guiana lump, from the *Machoiran*.
   - West Indian lump, from *Silurus felis*.
4. North American.
   - Hudson's Bay Purse.

Canadian Leaf.
New York Ribbon, from the refuse of various species.

5. East Indian. Supposed to be produced by several species of the genus *Polynemus.*

Cake and Purse.
Bombay Purse.
Penang Leaf and Purse.
Manilla.
Madras, from a fish like mullet, put up as "Long Staple."

Large as this series is, it by no means comprises all of the varieties of this interesting material. What I have shown will, however, give you some idea of its importance, and still more of the importance that you, who have daily to do with these things, should make yourselves intimately acquainted with such subjects not merely in their more common features, but in their most minute details,—not only because knowledge gives power, but in your case you will find it will give pecuniary reward also, for we are rapidly coming to the point when want of knowledge will bring want of business, whilst its possession will be certain to secure patronage to the pharmaceutical chemist.

There is one book I must commend to all of you,—I mean Pereira's 'Materia Medica.' It has given me more pleasure than any half-dozen novels I ever read. It has given me immense information, and it has been my great aid to this and other papers. It ought to be the aim of every young pharmaceutist to possess it, and his greatest pleasure to study it; and when such is the case the profession of pharmacy is certain to take its proper place amongst the learned professions of this and other countries.

At the close of the paper a cordial vote of thanks was proposed by the Chairman to Professor Archer, seconded by Mr. Blanshard, and carried with acclamation.

LONDON CHEMISTS' ASSOCIATION.

At the Meeting on Thursday, February 2, Mr. Cox occupied the chair, several ordinary members were elected, and Mr. J. B. Hurst, of Louth, and Mr. W. H. Pullen, of Leamington, were elected corresponding members.

A communication from Mr. Button, of Rangoon, containing notes on "Indian Pharmacy" was read, it was considered desirable to bring the matter forward again for discussion.

Mr. Beynon then read a paper on "The Preservation of Vegetable Substances." He said the preservation of vegetable and animal substances had, of late years, attracted a great deal of attention, more especially the preservation of such as are used for food, which, of all others, are most prone to decomposition. The keeping of vegetable substances was of greater interest to the pharmacist, deriving, as he does, so many of his medicines from the vegetable kingdom; upon the storing of them more care should be bestowed, as many, if not dried or preserved in a proper manner, lost their medicinal properties. Mr. Beynon first spoke of the preservation of the lower orders of plants, as the *Algæ*, *Fungi*, *Lichenes*, and *Filices*, mentioning those which are used as food, and detailing also the best way of making specimens of them for the herbarium; he then proceeded to speak of the preservation of different parts of plants, as their leaves, fruits, seeds, etc., giving the different methods by which ordinary articles of food as corn-seed, potatoes, etc. are kept from deteriorating. The keeping of *Digitalis*, *Conium*, and other medicinal plants, and the preparations made from them also received attention; the bottling of fruits was fully described, and their preparation for the purpose of illustrating structural botany.

After an interesting discussion, a vote of thanks was given to Mr. Beynon for his instructive paper, and much regret was expressed at his resignation of the Secretaryship of the Association, which office he has held for nearly two years.

Mr. Jessop was elected Secretary, *pro tem.*

A hearty vote of thanks to the chairman concluded the business of the evening.

Parliamentary and Law Proceedings.

Alleged Poisoning by a Cough Mixture.

On Monday, January 23rd, Mr. John Dale, chemist and druggist, of Great King Street, Macclesfield, was brought before the Glossop magistrates, charged with the manslaughter of Matilda Rowbotham.

The facts were that the defendant had sold several bottles of "Loxham's Cough Mixture" to the mother of the deceased, who retailed them at her shop. On the previous Thursday Mr. Dale called and saw that the little girl was suffering from hooping cough, and recommended a little of the cough mixture to be mixed with water and given occasionally.

The mother, upon cross-examination, admitted she had not followed Mr. Dale's directions, but had given the whole three spoonfuls between two o'clock in the afternoon and twelve o'clock at night. She further admitted that the child might have got to the medicine in her absence. The child was nine years old.

James Rhodes, M.D., proved having analysed the stomach. The child had died from a narcotic poison. In cross-examination he said that by morphine he meant laudanum; sulphuric acid might produce morphia in its action on laudanum. The directions on the bottle, if followed, would not be dangerous.

For the defence it was urged that all intelligent persons were aware that medicine improperly administered would often prove one of the strongest poisons. One of "Dover's Powders" was useful, two might possibly be injurious. Reference was made to Lord Lyndhurst's judgment in the case of *Reg.* v. *Webb*, where it was clearly laid down that to be manslaughter the medicine must be violent and dangerous, and administered by a person totally ignorant. Another point fatal to the prosecution was, that the mother had not followed the directions of Mr. Dale.

At the conclusion of the evidence, the magistrates decided upon dismissing the charge. As, however, Mr. Dale has been committed for trial upon the coroner's warrant consequent upon an inquest, he will have to appear at the assizes, but it is thought that the grand jury will not find a true bill.—*Macclesfield Courier.*

Poisoning by Home-made Lime-water.

At an inquest held at Birmingham, it was shown that a patient having been directed, among other things, to take a certain amount of lime-water every day, but not being told whether to buy it or make it himself, straightway procured some lime, mixed a lump with water, stirred it and drank the thick mixture. A few hours afterwards acute symptoms of gastritis set in, resulting in death. A verdict was returned by the jury to that effect.

The *Medical Times and Gazette*, in commenting upon this case, says that the lesson to be drawn from it is this, always to take for granted the complete ignorance of patients concerning the nature and properties of drugs, and never recommend them to be their own chemists, but tell them to apply to those whose legitimate business it is to supply them.

Attempted Suicide by Sugar of Lead.

Last week, a well-dressed man, named Thomas Gee, was charged at the Mansion-House with attempting to commit suicide. The prisoner was seen by a police officer on Southwark Bridge, apparently in great distress. While the officer was watching him, prisoner took a small packet from his pocket and put a portion of the contents into his mouth; then, seeing the constable coming towards him he ran away. Upon being caught he said, in answer to a question, that he had swallowed some sugar of lead. He was taken to a private surgery, but refused an emetic, and was then conveyed to St. Bartholomew's Hospital, where one was given him. Evidence was given that he was suffering under a monomania, and he was delivered over to the care of his friends.—*Times.*

Obituary.

At Carlisle, on the 29th of January, aged 70, Mr. James Parker Harrison, the oldest member of the trade in that City, having been in business for forty-seven years. Mr. Harrison became a member of the Pharmaceutical Society in 1842, and acted as Local Secretary until 1864, when the infirmities of age led him to relinquish that office.

MEETINGS FOR THE ENSUING WEEK.

Monday ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"The First Principles of Biology" (Educational Course). By Prof. Huxley.

Tuesday ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.
Royal Medical and Chirurgical Society, at 8.30 P.M.
Photographic Society, at 8 P.M.—Annual Meeting.

Wednesday ...*Society of Arts*, at 8 P.M.—"The Commerce of India." By Dadabhai Naoroji.

Thursday......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." By Prof. Odling.
London Institution, at 7.30 P.M.—"The Action, Nature and Detection of Poisons." By F. S. Barff.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.

Friday ....*Royal Institution*, at 9 P.M.—"The Wolf-Rock Lighthouse." Mr. Douglass.

The following journals have been received:—The 'British Medical Journal,' Feb. 4; the 'Medical Times and Gazette,' Feb. 4; the 'Lancet,' Feb. 4; the 'Medical Press and Circular,' Feb. 8; 'Nature,' Feb. 2; the 'Chemical News,' Feb. 3; 'Journal of the Society of Arts,' Feb. 2; 'Gardeners' Chronicle,' Feb. 4; the 'Grocer,' Feb. 4; the 'Produce Markets Review,' Feb. 4; the 'English Mechanic,' Feb. 3; the 'Florist and Pomologist' for February; the 'Food Journal' for February; the 'Milk Journal' for February; the 'Journal of the London Institution' for February; the 'Brewers' Guardian' for February; the 'Doctor' for February; Evans, Leschers and Evans' 'Price Current' for February; the 'Liverpool Daily Post,' Feb. 3; 'Bristol Times,' Feb. 4; 'Leicester Chronicle,' Feb. 4.

Dead at his Post.—A sad case was mentioned at the last meeting of the Bethnal Green Board of Guardians. One of the dispensers of the parish, Mr. Evans, while performing the duties now made so perilous by the outbreak of smallpox in the East End, was seized with the malady, and after eighteen days' suffering expired. His wife, worn out by tending him, took the disease, and is now lying ill in a wretched state of destitution. If ever there was a case deserving of commiseration this is one, for the unfortunate Evans died at the post of duty as truly as any soldier. The guardians, much to their credit, have started a subscription for the doubly desolate widow, and have voted her £25 out of the rates, a sum, however, which cannot be paid without permission from the Poor Law Board.—*Eastern Post.*

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[146.]—ORANGE-FLAVOURED CASTOR OIL.
Ol. Aurant. ʒj
Ol. Ricini ℥iv. M. F. C. S.

[151.]—LIME JUICE AND GLYCERINE.
Ol. Amygd. ℥ij
Ol. Limon. ʒij
Pot. Carb. ʒij
Glycerini ℥j
Aq. Calcis ℥xij. M. F. C. S.

℞. Ol. Amygd. Dulc. ℥iijss
Liq. Calcis ℥ijss
Ess. Bergam. gtt. xx
Otto gtt. iij.

Is a good form for what is usually retailed as "lime-juice and glycerine."

Another form is—
℞. Ol. Amygd. Dulc. ℥j
Liq. Calcis ℥iij.

Which makes both a thicker and whiter preparation; but owing to the small proportion of ol. contained therein, it will of necessity dry more quickly on the hair, and thereby not be so beneficial as the former one.—W. B. S., 42, *High Street, Bridgnorth.*

[153.]—REGISTERED LABELS.—I wish to ascertain the conditions which afford security for registered labels and registered trade-marks. I believe a registered label is secure only against an *exact* imitation. What may be a trade-mark? Can any word in ordinary use be a trade-mark? *e.g.*, antiseptic? If 'antiseptic' were registered as a trade-mark, would that prohibit its use by another for the same purpose, say 'antiseptic lotion'? and would this prohibit the use of antiseptic *wash*, for instance? Further, if an antiseptic lotion *label* were registered by one person, would that prohibit another from using 'antiseptic' as a trade-mark?—Octavius.

[154.]—ESS. SECALE.—Supposing "Ess. Secale" is ordered in a prescription, what should be used?—A. P. S.

[*** We believe it is the custom in London to use the fluid extract of ergot of the B. P.—Ed. Pharm. Journ.]

[155.]—GUM ACROIDES.—Will any correspondent favour me with information as to the source, uses and value of gum acroides?—G. V. Druce.

[156.]—WHITE OILS.—Will any of the readers of the Journal give me a formula for the above, possessing a uniform consistence and retaining the same?—J. T. N.

[157.]—SUBACETATE OF COPPER.—"*Sarum*" would be much obliged if any of the readers of the Journal can furnish him with a formula for preparing an alkaline solution of subacetate of copper (verdigris), similar to the officinal liquor plumbi subacetatis.

[*** The question, as it stands, is rather vague. Will our correspondent define more clearly his requirements?—Ed. Pharm. Journ.]

[158.]—BROWN HAIR DYE.—Will any reader kindly give a good recipe for the above?—Student.

[159.]—ANISEED CORDIAL.—"*Pimpinella Anisum*" will feel obliged to any gentleman who can give him a good formula for aniseed cordial.

Correspondence.

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

The Proposed Poison Regulations.

Sir,—As a sequel to a case of incompetent dispensing and consequent poisoning in a medical surgery, perhaps the following will prove that Mr. Bean is not the only medical gentleman who considers that "dispensing is merely mechanical, and that previous education has not much to do with it." Some time ago a shop-boy in my employ requested that he might leave, as Dr. —— had offered him more wages if he would come to him. His request was granted, and shortly after I was informed by my assistant that the boy's mother had called to say she was sorry for taking him away, but Dr. —— thought he would be very useful in his surgery after being eighteen months with a chemist, the boy being the only dispenser in the establishment, according to her statement.

Now, Sir, in the face of such glaring facts of incompetent dispensing in medical surgeries, can it be possible that H.M.'s Privy Council will close its eyes against such a reckless system, the extent and result of which can never be known in this world, and insist upon enacting further legislative measures upon the liberty of a body for whom they have done quite enough, whilst illiterate shop-boys and coachmen are allowed to pass observation and dispense with impunity?

Then again, what is a poison? Nearly all our preparations are poisonous only in overdoses; if so, how is the line to be drawn? Must our cellars be converted into poison stores and our shelves into an array of empty show-bottles? The inevitable consequence would be that our dispensing counters would become daily crowded with an indiscriminate mixture of bottles, etc., owing to the want of an opportunity of returning them to their dismal cells below, and mistakes and confusion would be the order of the day. As regards the subject of inspection mooted by some of your correspondents, what man of education and social standing, with an atom of professional pride, would submit to such humiliation and the stigma of utter incompetency to manage his own affairs?

If we are to be placed on a par with, and subject to the crusade against betting-houses and the notorious houses of the Haymarket, the sooner we abandon our profession the better. To a non-professional looker-on these proceedings would imply that poisoning the public must be a profitable traffic, which required to be put down by force of law. Are we supposed to be so ignorant with regard to our personal interests and welfare that we cannot be entrusted with the arrangements best suited to the requirements of our individual establishments? Are we so callous to the result of careless dispensing that we cannot realize the horrors thereof and the inevitable ruin it may entail upon us? Why this great outcry against poisons at the present moment?—we have killed neither a lord nor a bishop!

The majority of your anonymous advocates—(by the way, why anonymous? Are they ashamed of showing a bold front, and proving that they are none other than dispensing chemists?)—have written their "thema," with a "free accompaniment" which detracts from a beauty it never possessed; and the force of the composition is lost owing to the absence of harmonious facts. For instance, that "accidents have continually happened to human life," etc., are inadmissible false alarms, which cannot be substantiated. Since the Pharmacy Act was passed nearly three years ago, we have never enjoyed greater immunity from fatal mistakes,—a fact that commends itself as the most forcible argument. Why not leave well alone, and allow the Act, after advancing untrammelled so far, to accomplish that for which it was originally intended, namely, to provide dispensers of education with a store of knowledge equal to the requirements of their profession? We have allowed the outward, visible sign to engross our attention too long. If we would but spend the time we waste in studying bottles, labels, etc., in making ourselves better acquainted with the various preparations we use, and never allow them to pass through our hands without proper recognition, poisoning would become a thing of the past, and we should then have accomplished what the storing of poisons can never attain.

London, Jan. 31st, 1871. T. C. Jones.

Sir,—I venture again to make a few remarks on the keeping and storing of poisons. In my former letter, you kindly inserted, I mentioned the fact that in Glasgow nearly two-thirds of our drug retailers are surgeons and doctors, who keep open shop for the retailing and dispensing of poisons. It has been a custom to make the shop a stepping-stone to success in their profession among the poorer classes, who (from economy, I presume) find a boy at a salary of four or five shillings a week sufficiently qualified to dispense, manipulate and take charge of the shop during the greater part of the day, while the employer is visiting. Your article of the present week on dispensing in surgeries, illustrates a case very much to the point. I am convinced if the father of that unfortunate child had not been able to recognize the appearance of narcotism, the medical man would assuredly have taken advantage of the old refuge, "unfavourable symptoms set in," the child buried out of sight, the apprentice would begin anew dispensing his thousand prescriptions until the next 'cute father turned up. Is it not very natural to expect such cases to happen here? I am certain I speak for my brethren that we have no objection to a reasonable arrangement for the storing of poisons, and also that we bear no antipathy to surgeon-druggists. What we want is simply fair-play. I would suggest that all surgeons and doctors who keep open shops should be placed on the same restrictive platform with us, and also that they should be compelled to employ a properly qualified and examined assistant.

M. P. S. (p. 578) observes on my former letter that qualification is no protection to the public. I am astonished he should place so little favour on education, as he must know that the great aim of the Pharmaceutical Society has been the advancement of pharmaceutical knowledge, so that we may be more fully able to guard against mistakes, and that we should be led to feel that our privileges had given us greater responsibility. I hope the Pharmaceutical Society will let no opportunity slip so as to bring all dispensers of medicine into the fold. I think that this should have formed a most important part of the Bill at the outset.

Glasgow, February 4th, 1871. Pharmaceutist.

Sir,—Allow me to commend to the consideration of our worthy Council, *in re* the storing of poison question, the following quotation from the works of Dr. B. Franklin:—

"Perhaps, in general, it would be better if Government meddled no further with trade than to protect it and let it take its course. Most of the statutes or acts, edicts, arrests and placarts of parliaments, princes and states" (and I may add Councils of the Pharmaceutical Society) "for regulating, directing, or restraining of trade, have, we think, been either political blunders or jobs obtained by artful men for private advantage under pretence of public good. When Colbert assembled some of the wise old merchants of France, and desired their advice and opinion how he could best serve and promote commerce, their answer, after consultation, was in three words, *Laisser nous faire*—'Let us alone.' It is said by a very solid writer of the same nation, that he is well advanced in the science of politics who knows the full force of that maxim, *pas trop gouverner*, 'not to govern too much;' which, perhaps, would be of more use when applied to trade than in any other public concern."

I will not, Sir, impair the force of the foregoing quotation by any observation of my own. A Founder.

36, *Sloane Square, S.W., February 6th*, 1871.

Sir,—If the discussion upon the "poisons storing regulations" should not result in the withdrawal of the proposed regulations or in the adoption of some definite policy, it will, at least, have formed a most instructive medium for the expression of trade opinions, embracing as it does so many phases of practical interest to the chemist and druggist. I shall not follow your correspondents through the details of the question, for, opposing the scheme, as I do *in toto*, it will be unnecessary for me to depart from the question as to the expediency of the proposed legislation. After years of persevering agitation, conducted with praiseworthy energy, mainly by our metropolitan brethren (*palmam qui meruit ferat*), the Pharmaceutical Society successfully carried the present Pharmacy Act. The result is that the educational test is compulsory for every future chemist and druggist. The Council of the Pharmaceutical Society, nominally assisted by the Privy Council, frame regulations for conducting the examinations. If the present curriculum has not enough of the practical character in it to give a good trade education whereby the public may be protected, by all means let the Council make it more practical, and members and students will cheerfully assist in carrying out the alterations deemed necessary. But I cannot conceive any managing body or Council, after having successfully pursued a steadily increasing and popular mode of improving the qualification and status of the chemist and druggist, stultifying their previous exertions by wishing to force the adoption of an obnoxious, unnecessary and arbitrary scheme of shop-arrangement for the storing of poisons. Moral, or rather educational, improvement has already answered admirably; why then supplement it by force? The responsibility of the trade being established, why may not their discretionary power be safely trusted? And even in cases where there is an absence of average care and observation, restrictive legislation will not supply the wanting necessities. Again, just as a growing feeling of confidence is springing up in the public mind towards the long-despised chemist and druggist, ought it to be disturbed or checked? for, as regards poisons generally, my opinion is that a great error has been committed in making the word poison so common, that the absurdity of its use in many cases brings it into contempt. The majority of people have no just conception of the varying potency of poisons; and as the yellow primrose was to Wordsworth's idiot hero, so to the public generally is the word poison, whether it be applied to aconite liniment or paregoric elixir.

If the probabilities of the origin of all the railway accidents that have ever occurred, were compelled, by legislative enactment, to be kept constantly before railway officials and means adopted for the prevention of a repetition of one and all of such accidents, and the red danger-signal constantly displayed to show not merely actual danger, but the caution necessary to prevent probable danger, would railway accidents cease? Would not one moiety of the protected public always travel in fear and trembling, seeing death or injury in every crimson flash of the signal; while another moiety would regard the precautions with such contempt as would probably even create a victim to a system which an over-cautious policy had introduced? Let moderation guide the Council. All over-drawn or over-cautious measures are failures. We may easily, like a modern Frankenstein, raise a monster in this word poison which cannot be subdued. And whose soothing eloquence shall restore to a disturbed public that peace of ignorance and confidence which a poison agitation of possible dangers shall have destroyed? Our Council need not fall into any error of this kind; they have abundant means of letting the subject drop. Not the least is, that a Parliament overtaxed with necessary national legislation, will not lament the absence of a measure which would cause their time to be wasted upon unnecessary legislation concerning chemists' shop-fittings.

A Country Pharmaceutical Chemist.

A Reclamation.

Sir,—In your Journal of the 21st inst. there is a letter signed "Fair Play," Brighton, in which my name is introduced in connection with a poisoning case which occurred in an establishment I was formerly managing partner of. I therefore wish to let it be known, through your Journal, as an answer to all communications on the same subject, that I retired from the business some time before the occurrence took place, nor was I in any way connected with it, neither was any one of the name of Oldham a partner in the house.

George Oldham.

1, *Upper Mount Street, Dublin.*

Druggists' Charges.

Sir,—As tending to throw some light upon the present state of trade ethics in our locality, we enclose an advertisement cut from our local papers for the benefit of your readers. It emanates from a "*Pharmaceutical*" Chemist in this city:—

DRUGGISTS AND THEIR CHARGES.—Look at the Extract from the *Lancet* copied into the Local Papers. One man charges 4*s*. for a 6 oz. Bottle of Medicine, another 1*s*. 6*d*. for the same. I charge, on an average only 9*d*. Can it be possible that the public will still submit to such an enormous imposition?

If worth an insertion in the Journal please put it in, and oblige I. and I. W.

Jan. 31*st*, 1871.

Chloric Ether and Chloroform Discovery. Detur Digniori.

Sir,—I think it will interest those who are still desirous to trace the original discovery of chloric ether and chloroform, to say that there is not much in this alleged use of chloric ether by Sir W. Lawrence; the great credit is due to Mr. Waldie, the chemist, as recently shown in a pamphlet by his brother, who was decidedly the person who explained its use, and, in a long acquaintanceship with the late Sir J. Simpson, induced the latter to adopt it long before Sir W. Lawrence. It is most unfair the manner in which that pamphlet has been treated by certain medical journals, as poor Waldie was only a "common chemist," not a baronet.

Dr. Formby, of Liverpool, and the eminent French physician Flourens, both had adopted these agents before any one else, but Waldie was the chemist who supplied Formby, and urged it on Simpson; without Waldie (the brother) we should never have heard perhaps of chloroform as a medicinal agent, for it lay forgotten amongst Liebig's discoveries.

C. K.

P.S. In an American Dispensatory, Wood and Bache's, this curious phrase occurs many years before even Waldie, "in affections characterized by difficult respiration, chloroform may be used by inhalation," but the operation was apparently lost.

M. P. S. complains that many persons have been registered as chemists and druggists who were in business previous to the passing of the Pharmacy Act, 1868, and are quite incompetent to perform the duties of such. This must necessarily be the case, and until the transition stage has passed, such cases as he refers to can only be remedied by reporting them to the Secretary, who will lay the matter before the Council of the Society, and if upon investigation any deception has been practised, the registrar will be ordered to strike them off the register. Our correspondent will notice that several such cases have occurred, and he had better communicate with the Secretary, if he thinks he can make out a clear case against the parties of whom he complains.

The Position of Pharmacists.—A correspondent in Cardiff sends us the card of a neighbour who combines the trades of tailor, draper and stationer with that of chemist and druggist, and inquires whether this is an instance of attempting to elevate the trade. It is unfortunate but, perhaps, unavoidable that in some obscure localities such heterogeneous combinations are matter of necessity to some extent. We hope the advertiser is at any rate qualified to act as a pharmacist, and in that case we do not object to his being also a tailor and draper, if he likes it.—Ed. Ph. J.

J. Wain (Ripley).—You can come up for examination at any time, even before you are apprenticed.

Messrs. Beal and Son.—The advertisement and stamps have been forwarded to the publishers.

"*Austria*" has forgotten to forward his name and address.

"*Young Apprentice.*"—*Dies* is nominative, *die* ablative. Each is correct, according to the ellipsis intended. In the case cited, the latter would be preferable.

NOTICE.

We have this week received several letters enclosing advertisements and stamps. In order to prevent loss of time, we beg to call our correspondents' attention to the notice published every week in this Journal, that communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, Bloomsbury Square; instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.; advertisements to Messrs. Churchill, New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."

Communications, Letters, etc., have been received from Mr. J. R. Jackson, Mr. J. Barnard, Mr. J. J. Thomas, Mr. H. J. Woolley, Mr. H. Humphrey, Mr. J. T. Sandell, Professor Gamgee, Mr. G. Sant, Mr. J. Agnew, Mr. Miller, Mr. F. Barrett, Mr. R. Corner, Mr. A. Uttley, Mr. H. M. Davies, Manchester Chemists and Druggists' Association, A. M. P., J. T., F. C. S., W. B. S., M. P. S., J. T. B., T. W., W. J., "Veritas," Chemist's Assistant, Student, An Assistant.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Continued from page 603.*)

Nat. Order. Cruciferæ.

This Order of plants is a remarkable group, both for chemical and botanical characteristics.

They all contain nitrogen and sulphur in large quantities, and when decaying give off most offensive odours. In certain conditions all form peculiar compounds of sulphocyanic acid with peculiar radicals; nevertheless, none are poisonous, and a great number are used for food.

The floral type is peculiarly cruciform, the calyx having four sepals, and the corolla four petals. With a few exceptions the crucifers produce a bivalved pod or siliqua, which is usually two-celled.

The plants of this Order are easily distinguished by the tetradynamous stamens, or while numbering six, four are long and two short.

Cochlearia Armoracia (Linn.).

This well-known auxiliary to the roast beef of old England is found wild on the banks of the river Avon, between Bristol and Keynsham, and also at Stapleton, near the Frome.

It is distinguished from all the other species of *Cochlearia* by the elongated form and large size of the leaves. As before mentioned, its long tapering root has been mistaken for that of the aconite, but may easily be recognized by its light colour and pungent odour. The fresh root is the only part of the plant used in the B. P., as an ingredient in the Sp. Armor. Co.

What is usually termed the root includes not only the root proper, but also the rhizome or underground stem, for the latter produces buds, and multiplies with great rapidity beneath the surface of the ground.

To the chemist, horseradish is exceedingly interesting, because it contains 4 per cent. of a powerfully pungent oil, which is generally regarded as a salt of the radical allyl (C_3H_5), although Hofmann has stated it to be the salt of another radical, butyl or tetryl (C_4H_9). By most authors, however, the oil of horseradish is considered as the sulphocyanate of allyl (C_3H_5CNS).

It is a very singular fact that the cruciferous plants produce compounds of sulphur and allyl that are so well known in the genus Allium, plants so dissimilar in habit and construction as to be in both exogenous and endogenous divisions of the vegetable kingdom.

In every part of the world the garlic flavour seems to be a favourite. The Israelites of old regretted the loss of their leeks and onions. The Englishman likes the addition of a shallot, mustard, or horseradish to his beefsteak. The Spaniard selects the onion, and the Asiatic assafœtida.

Even the Brazilian has chosen the petiveria and sequieria, both of which have an alliaceous flavour.

The whole of these owe their smell and taste to allyl, which in the onion tribe exists as a sulphide.

For the purpose of experimentally examining the oil of horseradish, the author scraped three ounces of the fresh root, and placed it in a glass retort with three ounces of distilled water; a distillate was obtained, containing about half a drachm of a yellowish oil, which smelt strongly of horseradish, irritated the eyes, and was so extremely pungent that the tongue was nearly blistered. The product was then placed in a small retort with chloride of calcium, and again distilled at a low temperature. About half a drachm of a nearly colourless oil was obtained, perfectly soluble in alcohol. The addition of ammonia immediately threw down crystals of thiosinnamine. So strong was the odour of the oil, that it could be detected all over the house. The oil is heavier than water, thus differing from the oil of garlic, which is lighter, and is not acted upon by alkalies.

Sinapis nigra (Linn.).

This plant occurs very commonly throughout the district on hedgebanks, and waste places. In Bentham's 'English Flora' the mustard plant is described as Brassica, following the classification of Boissier.

Sinapis nigra is distinguished from *S. alba* by being nearly smooth. The pod is without the long flattened beak. It is the most plentiful source of flour of mustard, although both species are used. The seeds of *S. nigra* are much more pungent than those of *S. alba*, and differ entirely in chemical composition.

In manufacturing flour of mustard, the seeds, after being crushed and pounded in mortars, are subjected to several siftings. Four qualities are supplied to the trade, viz. seconds, fine, superfine, and double superfine,—the last being the purest, but seldom kept by the grocer. No article is more adulterated or lowered than flour of mustard, and seldom at the dinner table can this condiment be had with even a moderately pungent taste. Some of the witnesses before the Parliamentary Committee plainly stated that the adulterants used were flour of wheat, turmeric, capsicum, black pepper, potato starch, plaster of Paris, charlock, pea flour, radish, rape, linseed meal and yellow ochre!!! In short, if the microscopist wants a little experience in the detection of adulterants, he cannot do better than get a few samples of so-called mustard.

The most valuable constituents of black mustard seeds are the fixed oil, myrosin, and myronate of potassium.

When subjected to pressure, the seeds yield about 23 per cent. of a yellowish-brown oil, which does not easily turn rancid, and has a sp. gr. ·916. It is soluble in four parts of ether and 1000 parts of alcohol. Generally the oil is obtained from the dressings of the mustard seeds.

The most important product is the essential oil mentioned in the Pharmacopœia, and which, singularly enough, does not exist in the seeds at all, but is produced by the action of water on the myrosin and myronate of potassium.

Myrosin is a nitrogenous ferment, and performs the part in mustard that synaptase does in the almond. It may be easily prepared by exhausting with cold water, evaporating to the consistence of a syrup, and precipitating by alcohol. Like albumen myrosin is coagulable by heat.

Myronate of potassium ($K,C_{10}H_{18}NS_2O_{10}$), when crystallized from water, appears as anhydrous rhombic prisms, but when from alcohol as very beautiful little tufts radiating from the centre. To obtain this salt, the seeds are exhausted with twice their weight of alcohol. The pressed residue is then mixed with three times its weight of cold water, and left for twenty-four hours, pressed and filtered. The aqueous solution must be evaporated nearly to dryness, with the addition of a small portion of barium carbonate, and boiled with a large quantity of alcohol. On distilling off the alcohol the myronate crystallizes. About 90 grains are produced from 2 lbs. of seed. With a little solution of myrosin these crystals yield the oil of mustard, which is the sulphocyanate of allyl.

We may now easily understand the chemical changes that take place when table mustard, or a mustard poultice is prepared. The water dissolves the myrosin, sets it at liberty to act on the myronate of potassium, and from its decomposition is produced the essential oil, acid potassium sulphate, and glucose.

$$\underset{\text{Myronate of Potassium.}}{K,C_{10}H_{18}NS_2O_{10}} = \underset{\text{Ol. Sinapis.}}{C_3H_5CNS} + \underset{\text{Glucose.}}{C_6H_{12}O_6} + \underset{\text{Acid Sulphate of Potassium.}}{KHSO_4}$$

Alcohol, acids, potassium carbonate, or heat prevent this change, so that the popular notion of preparing mustard for the table, or as a poultice, with vinegar or boiling water is a great mistake. Cold water and time for maceration are the true scientific and best method. When making the French preparation with vinegar, the oil must first be developed with cold water, and then the vinegar added, because when the oil *is once formed*, acids do not alter its properties.

The natural connection between the mustards and the garlics has been mentioned, and is easily explained by a chemical experiment, the object of which is to convert the oil of mustard (sulphocyanate of allyl) into oil of garlic (sulphide of allyl). This is accomplished by heating the former to a temperature of 250° for some hours in a sealed tube with dipotassic sulphide (K_2S) :—

$$2\,\underset{\text{Oil of Mustard.}}{(C_3H_5CNS)} + K_2S = \underset{\text{Oil of Garlic.}}{(C_3H_5)_2S} + \underset{\text{Potassic Sulphocyanide.}}{2\,(KCNS)}.$$

The well-known pungent smell of the volatile oil is made use of, to detect the adulteration of oil-cake with mustard-cake, and sold as food for cattle. A little of the suspected cake is stirred with a little lukewarm water, and placed aside for a few hours. If a very small percentage of mustard be used, it will soon become apparent by the peculiar odour of oil of mustard.

Sinapis alba (Linn.).

This species is found in the same locality, and in somewhat greater abundance than that already described, from which it differs by the pinnatifid leaves and bristly pods.

It also differs essentially in its chemical composition. The seeds of the white mustard contain no myronate of potassium, and therefore cannot produce any volatile oil. They, however, contain a larger proportion of the nitrogenous ferment myrosin, which explains the reason why a mixture of black and white seeds produces a better flour for dietetic use than the black alone, viz. by furnishing a more plentiful supply of myrosin for the decomposition of the myronic acid in the black.

Instead of the myronate of potassium, the white mustard-seeds contain a crystallizable compound called sulphocyanate of sinapin. It may be procured by exhausting the seeds, first with ether and then with hot alcohol. The greater part of the alcohol is distilled off, when prismatic crystals separate. Sulphocyanate of sinapin ($C_{16}H_{23}NO_5,CNHS$) is inodorous and bitter. It is coloured yellow by ammonia, strychnine, morphine, quinine and nicotine, but not narcotine or salicine. It is reddened by nitric acid and persalts of iron. This explains the curious circumstance that perchloride of iron reddens an infusion of white but not of black mustard. The slightly pungent taste of white mustard is caused by the action of the myrosin moistened with water upon the sulphocyanide of sinapin, forming an acrid but *not a volatile* principle.

When acted upon by alkalies, the sinapin salt is converted into another base, sincalin ($C_5H_{13}NO$), potassic sinapate, and potassium sulphocyanate.

$$\underset{\text{Sulphocy. Sinapin.}}{C_{16}H_{23}NO_5,CNHS} + 3KHO$$
$$= \underset{\text{Potass. Sinap.}}{C_{11}H_{10}K_2O_5} + \underset{\text{Sincalin.}}{C_5H_{13}NO} + \underset{\text{Pot. Sulphocy.}}{CNKS} + 2H_2O.$$

On pressure, the seeds of the white mustard will yield sometimes as much as 30 per cent. of fixed oil.

The microscopic structure of the mustard-seed is extremely interesting, especially in the case of the white, which is essentially different from the black.

The seeds of both have a husk, built up with three layers of cells, or tunics. The exterior tunic consists of a transparent series of hexagonal cells $\frac{1}{435}$ inch broad and $\frac{1}{330}$ inch long, and united to each other by a corrugated cell-wall. In the centre of each is an aperture surrounded by an elastic spiral fibre, from which a long tube passes from the exterior to the interior. When wetted with water this elastic apparatus springs forward, projecting from the surface like the schoolboy's "Jack in the box," carrying with it the tube, from which flows a mucilaginous fluid. It is distinctly different from the well-known spirals of the *Collomia*, but rather resembles the cushion-springs of the upholsterer, covered with an exceedingly fine membrane. The best method of viewing it under the microscope is by the aid of polarized light and a blue selenite stage. This curious compound cell is totally absent in the black mustard-seeds.

The middle tunic is a single layer of very small cells, averaging only $\frac{1}{3000}$ inch, and filled with the colouring matter. The internal coat of the husk consists of a layer of cells about $\frac{1}{1000}$ inch in diameter, and irregular in shape and size. The seed itself is formed of minute cells, which contain a large quantity of fixed oils.

Neither iodine nor polarized light indicate the presence of starch in any part of the mustard-seeds, so that an admixture of wheat or other flour may be readily detected.

Nat. Order. Linaceæ.

This small Order, although only numbering three genera, and all insignificant in size, yet have played no small part in the history of mankind. All are famous for yielding an abundance of useful products. Only one species is made use of in our materia medica.

Linum usitatissimum (Linn.).

As its specific name denotes, the flax plant is most valuable for many purposes. It has furnished our garments from the earliest period. It is the chief ingredient in our paints, the best application for a burn, and a most excellent food for our cattle when other fodder is scarce. To it the surgeon owes his lint, the printer his paper, the navy its ropes, and the housewife her linen; and, after serving every useful purpose, and passing into the rag-bag, these invaluable fibres go—

> "Into the paper-mill, and from its jaws
> Stainless and smooth emerge. Happy shall be
> Its renovation, if on its fair page
> Wisdom and Truth their hallow'd lineaments
> Trace for posterity. So shall its end
> Be better than its birth."

Indeed, so indispensable has the success of the flax crop been considered, that its failure has been frequently described as a national calamity, and is mentioned by Moses as one of the Egyptian punishments.

Hardly an author can be mentioned who does not in some way or other speak of this lowly plant.

Virgil describes the flax crops, with the other profitable speculations of the husbandman:—

> "Urit enim lini campum seges, urit avenæ.'

Horace tells of the benefit derived from straining his Massican wine through the linen filter:—

> "ut illa
> Integrum perdunt lino vitiata saporem."

The products of this humble plant, familiar as they are to every apprentice, most commonly are allowed to pass by without the slightest thought about their hidden interest. To the student the tow, the linseed oil, the linseed and the linseed meal are among the wonders of nature.

Specimens of the *Linum usitatissimum* may be collected at Henbury, Keynsham, Ashton, and several other places in the neighbourhood of Bristol.

The microscopic structure of the seeds and stem of the flax plant must not be passed over, because its knowledge is very necessary to the analyst, who is often called upon to defeat the schemes of the adulterator of oil cake, linseed meal, or various fabrics.

When the stem of the flax plant is soaked in water the fibres of the inner bark, or liber, may be separated for examination. From these is produced our tow. When a few fibres are examined by the microscope they are seen to consist of long cells of cellulin from $\frac{1}{3000}$ to $\frac{1}{2000}$ inch in diameter. These may be used for experimental observations on the chemical properties of cellulin ($C_{18}H_{30}O_{15}$). When tow is boiled with diluted sulphuric acid, it is partially converted into dextrine and grape sugar:—

$$\underset{\text{Cellulin.}}{C_{18}H_{30}O_{15}} + H_2O = 2(\underset{\text{Dextrin.}}{C_6H_{10}O_5}) + \underset{\text{Grape Sugar.}}{C_6H_{12}O_6}.$$

When acted upon by nitric acid or alkalies, oxalic acid is formed:—

$$\underset{\text{Cellulin.}}{C_{18}H_{30}O_{15}} + O_{27} = 9\,(\underset{\text{Oxalic Acid.}}{C_2H_2O_4}) + 6\,H_2O.$$

When strong nitric and sulphuric acids are mixed with flax fibres, pyroxylin is produced, as in the B. P.:—

$$\underset{\text{Cellulin.}}{C_{18}H_{30}O_{15}} + \underset{\text{Nitric Acid.}}{6\,HNO_3} = \underset{\text{Pyroxylin.}}{C_{18}H_{24}, 6\,NO_2, O_{15}} + 6\,H_2O.$$

The tow that is most generally used is not derived from flax, but hemp, a member of the nettle family. It differs materially in its properties. When examined under a high power the fibres, from $\frac{1}{650}$ to $\frac{1}{500}$ inch in diameter, are seen to be formed of bundles of cells, pointed at each end, closely fitted to each other and cemented together by a peculiar resin. Till prepared by boiling with strong nitro-hydrochloric acid the fibres are opaque, but when cleansed are very beautiful objects for polarized light. Hemp cells show traces of transverse striæ, while those of true flax are longitudinal. Flax is not coloured by nitric acid, while hemp is reddened. When the tow derived from hemp is placed in a solution of chlorinated lime it turns yellow; when well washed with water and immersed in sodic sulphite, the yellow tint is changed into a very beautiful crimson. This is not the case with flax, but is due to the presence of the hemp resin.

When a section of the flax seed (linseed) is placed under the microscope four distinct coats may be seen.

The external layer is composed of hexagonal cells, measuring about $\frac{1}{1200}$ inch. These give the polish and colour to the seeds, and are filled with mucilage; when acted upon by warm water these cells swell and burst. The mucilage is slightly acid, and turns a ray of polarized light to the left; when acted upon by iodine with sulphuric acid, or zincic chloride, it is not coloured, like the mucilage from many other plants. It consists chiefly of Arabic acid ($C_{12}H_{22}O_{11}$), which is soluble in water, and bassorin ($C_{12}H_{20}O_{10}$), which is insoluble unless when mixed with an alkali.

The next coat is a layer of rounded cells about $\frac{1}{1430}$ inch in diameter and filled with granular contents. The third layer is built up with long, narrow cells, about $\frac{1}{3700}$ inch in diameter, crossing each other at right angles, as if for the purpose of making a tough envelope for the seed.

The fourth and internal layer is composed of irregular cells, smaller than the others, and filled with a kind of resin, which readily escapes from the cells when cut.

The seed itself consists of very small cells, averaging $\frac{1}{1250}$ inch, and filled with oil and starch.

The seeds yield about one-fifth their weight of oil, having a sp. gr. ·9395. Pure linseed oil dissolves in five times its weight of alcohol when boiling and forty when cold. It solidifies at —17° C., takes fire with fuming nitric acid, and when heated for some time at a high temperature, becomes converted into a dark sticky mass, which is so viscid that it may be used as birdlime.

Linseed oil is a typical example of what is called a drying oil. By exposure to the atmosphere it suffers oxidation and becomes resinified. Linseed oil probably owes this property to the presence of linolein. When saponified the linolein becomes converted into linoleic acid ($C_{16}H_{28}O_2$). When boiled with lead or manganese a margarate and linoleate of the metal are formed, and the drying quality increased. The residue, after the removal of the oil by pressure, is sold as oil cake, and when ground, as linseed meal. Both these are terribly adulterated with sand, clay, twigs, sawdust and refuse from other seeds, and which can only be detected and exposed by the assistance of a microscope.

(*To be continued.*)

Cowhage.—Mr. J. Weichselbaum, of Savannah, in a communication to the *American Journal of Pharmacy*, says that the irritation of the skin caused by contact with the leguminous pods of *Mucuna pruriens* (Cowhage), may be instantaneously removed by the application of camphor liniment.

DECOMPOSITION OF ACETATE OF MORPHIA IN SOLUTION.*

BY JOHN M. MAISCH.

That aqueous solutions of the salts of most officinal alkaloids cannot be kept for indefinite periods is well known to all pharmacists. Whether distilled water, or boiled and filtered hydrant water—the latter containing but traces of foreign matter—be used for such solutions, whitish floccules usually make their appearance after some time, and gradually assume a soft gelatinous consistence, with the appearance of algaceous growth. In the few instances in which the writer assayed such altered solutions of the sulphates of quinia and of morphia, a diminution of the amount of alkaloid has not been observed, and the appearance of this foreign body was therefore rather attributed to accidental organic impurities in the water, and this belief was strengthened by the fact that the bulk of these flocks varies in solutions made at different times, and after some time apparently does not increase, and that the presence of an excess of sulphuric acid prevents such a formation or at least diminishes its amount.

It is also well known that a neutral solution of acetate of ammonia gradually deposits flocks, and that the liquid then assumes an alkaline reaction. This was first observed by Horst,† who attributes this decomposition of aqueous solutions of acetate and succinate of ammonia to the light, and recommends to keep them in a dark place; if ammonia was replaced by potash or soda, this decomposition did not take place. I am not aware that the amount of ammonia has ever been estimated in the fresh solution and after the decomposition has taken place.

A solution of acetate of morphia is very prone to change; it soon acquires a brown-yellowish colour, and deposits a brown matter. A decomposition was already observed by E. Merck in 1837,‡ when experimenting about the best process for obtaining this salt dry, in a neutral condition; he states that the evaporation of its solution must be hastened at a low temperature by a current of air or other means, since it is decomposed at too slow an evaporation. But the nature of this decomposition is not stated.

Some months ago, Dr. Wm. T. Taylor, of this city, informed me that he prefers to use a solution of this salt for hypodermic injection, and that he had repeatedly observed the separation in the liquid of one or more crystals, after keeping it on hand for some time.§ A careful examination of a crystal proved it to be pure morphia, entirely free from acetic or other acid; with nitric and iodic acids, and with sesquichloride of iron, it showed the reactions characteristic for morphia; it had an alkaline reaction to test papers, and neither acetic, carbonic nor any mineral acid could be discovered by the appropriate tests; heated upon platinum foil it was consumed without leaving any residue.

The liquid had deposited a considerable quantity of a brown matter, and was of a pale brownish colour. It was neutral to test paper, but with pure sesquichloride of iron acquired a reddish tint, which disappeared on the addition of muriatic acid. Acidulated with nitric acid, iodohydrargyrate of potassium occasioned a turbidity. Evidently a minute portion of acetate of morphia remained still in solution.

To the kindness of Dr. Taylor I am indebted for the specimen upon the table, which was originally a solution of 8 grains acetate of morphia in half an ounce of distilled water. By accident, it had been set aside, and was lost sight of for several months. On examining it, the deposit and the change in colour of the solution, mentioned before, were observed, and a single crystal reaching from the surface of the liquid diagonally through the solution to the bottom of the vial on the opposite side.

The gradual decomposition of acetic acid in crude vinegar is well known, and it is possible that the changes noticed above are of the same or a similar nature. At any rate it is very evident that acetic acid, in contact with organic bodies, is very liable to undergo decomposition, and since an organic body in such a condition is apt to predispose others, with which it may be in direct contact, to similar changes, it is a question of great moment whether the addition of acetic acid to our officinal fluid extracts of ergot and of ipecacuanha may not be more detrimental than useful.—*American Journal of Pharmacy.*

* Read before the Philadelphia College of Pharmacy, Dec. 20, 1870.

† Archiv d. Pharm. 1823. Buchner's 'Repertorium,' vol. xviii. p. 481.

‡ Archiv d. Pharm. vol. xxiv. p. 46. Buchner's Repert. vol. lxiv. p. 265.

§ Mr. W. Martindale has already drawn attention to this in the PHARMACEUTICAL JOURNAL, 2nd series, vol. xi. p. 480. —ED. PHARM. JOURN.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

CRETA PRÆPARATA.—Chalk is a native carbonate of lime found in beds of considerable extent in the south of England. It consists almost exclusively of the remains of microscopic foraminiferous and other shells; it therefore contains numerous chemical impurities, of which the most abundant is silica. Magnesia, alumina, iron and phosphates may also be present. Precipitated chalk, however, possesses a distinctly crystalline structure, and if carefully prepared, is chemically pure.

CUPRI SULPHAS.—[§ $CuSO_4 5H_2O$. May be obtained by heating sulphuric acid and copper together, dissolving the soluble product in hot water, and evaporating the solution until crystallization takes place on cooling.] In this process half of the sulphuric acid is decomposed, with evolution of sulphurous anhydride.

$$Cu + 2H_2SO_4 = CuSO_4 + SO_2 + 2H_2O.$$

A more economical plan, and one commonly adopted, consists in oxidizing the copper by heating it in a reverberatory furnace, before submitting it to the action of the sulphuric acid. The black oxide of copper thus formed dissolves easily without evolution of gas.

$$CuO + H_2SO_4 = CuSO_4 + H_2O.$$

Like many other sulphates, this salt is strongly acid to test paper. Heated to about 390° F. it becomes white and anhydrous; in this state it is employed as a test for water in absolute alcohol. Contact with moisture causes it to reassume a blue colour.

[§ The aqueous solution gives with chloride of barium a white precipitate ($BaSO_4$) insoluble in hydrochloric acid; and a maroon-red precipitate (ferrocyanide of copper ($Cu_2FeC_6N_6$) with yellow prussiate of potash.] Much of the blue vitriol of commerce contains a considerable amount of sulphate of iron; to detect it the test given in the Pharmacopœia may be employed. It is first mixed with chlorine water, to convert the ferrous into ferric salt, and then ammonia is added in excess. If iron is present in any notable quantity, it makes its appearance as a brown precipitate floating in the deep-blue liquid. Minute quantities may, however, easily be overlooked.

Emplastrum Plumbi.—Oxide of lead (litharge) in fine powder is boiled for some hours with olive oil and water, the latter being supplied as it evaporates. The Pharmacopœia gives no directions as to what is to be done with the solution of glycerine, which is mixed up with the plaster at the end of the process; most of it is usually squeezed out and rejected. The reaction which takes place is an interesting one. Olive oil is a mixture of a fluid fat, olein, and a solid, usually called margarine. Since the olein forms the chief bulk of the oil, we will consider the action of the hydrated plumbic oxide upon that only.

$$\underset{\text{Olein or Trioleate of Glyceryl.}}{2(C_3H_5\,3\,C_{18}H_{33}O_2)} \quad + \quad \underset{\text{Hydrated Oxide of Lead.}}{3(PbO, H_2O)}$$

$$= \underset{\text{Glycerine or Hydrate of Glyceryl.}}{2(C_3H_5\,3\,HO)} \quad + \quad \underset{\text{Lead Plaster or Oleate of Lead.}}{3(Pb\,2\,C_{18}H_{33}O_2)}$$

This decomposition it will be seen, notwithstanding the complex character of the radicles involved, is really a very simple one, being a double decomposition analogous to that by which, for instance, ferric hydrate is produced from a ferric salt.

$$\underset{\text{Oleate of Glyceryl.}}{2(Gl'''Ol_3)} \quad + \quad \underset{\text{Hydrate of Lead.}}{3(Pb\,2\,HO)}$$

$$= \underset{\text{Hydrate of Glyceryl.}}{2(Gl'''\,3\,HO)} \quad + \quad \underset{\text{Oleate of Lead.}}{3(PbOl_2).}$$

$$\underset{\text{Ferric Sulphate.}}{Fe_2\,3\,SO_4} \quad + \quad \underset{\text{Hydrate of Sodium.}}{6\,NaHO}$$

$$= \underset{\text{Ferric Hydrate.}}{Fe_2\,6\,HO} \quad + \quad \underset{\text{Sulphate of Sodium.}}{3\,Na_2SO_4.}$$

The process of saponification is similar. A fat boiled with a solution of caustic alkali yields a soap and glycerine.

$$\underset{\text{Olein or Oleate of Glyceryl.}}{Gl'''Ol_3} \quad + \quad \underset{\text{Hydrate of Sodium.}}{3\,NaHO}$$

$$= \underset{\text{Glycerine or Hydrate of Glyceryl.}}{Gl'''\,3\,HO} \quad + \quad \underset{\text{Hard Soap or Oleate of Sodium.}}{3\,NaOl.}$$

Ferri Arsenias.—See *Acidum Arseniosum.*

Ferri Carbonas Saccharata.—[§ Carbonate of iron, $FeCO_3$, mixed with peroxide of iron and sugar.]

Hot solutions of carbonate of ammonia and sulphate of iron are mixed together, and the resulting precipitate after the effervescence is over, is collected and washed with boiling water. The mother liquor having been, as far as possible, squeezed out, it is then mixed with sugar and dried over a water-bath.

The white precipitate which is first formed is probably the ferrous carbonate—

$$(NH_4)_2CO_3 + FeSO_4 = (NH_4)_2SO_4 + FeCO_3;$$

but it very soon becomes green, carbonic acid gas escaping. Its constitution is then probably analogous to that of carbonate of zinc:—

$$3\,FeCO_3 + 2\,H_2O$$
$$\text{becoming } FeCO_3\,2\,[Fe(HO)_2] + 2\,CO_2.$$

Subsequently, upon exposure to the air, oxygen is absorbed, and a brown hydrated ferric oxide is produced. To retard this change as much as possible, it is advisable to employ solutions more concentrated than those ordered by the Pharmacopœia. I have found it a good plan to throw into the hot solution of the carbonate the powdered ferrous sulphate in the solid state, and to keep the mixture nearly boiling for about a quarter of an hour. In this way a very dense precipitate is produced which does not so rapidly undergo oxidation.

The product should be grey, not brown, in colour, and should effervesce when introduced into an acid.

[§ 2 grams dissolved in excess of hydrochloric acid and diluted with water, continue to give a blue precipitate with the red prussiate of potash, until at least 22* cubic centimetres of the volumetric solution of bichromate of potash have been added.]

The action of bichromate of potash on an acid solution of a ferrous salt is shown in the following equation:—

$$6\,FeCl_2 + 14\,HCl + K_2Cr_2O_7$$
$$= 3\,Fe_2Cl_6 + 2\,KCl + Cr_2Cl_6 + 7\,H_2O.$$

Every molecule of red chromate, weighing 295 grams, will convert into a ferric salt six molecules of any ferrous salt; and, at the end of the reaction, the solution will no longer give a blue precipitate with red prussiate of potash. Now, 20,000 c. c. of the volumetric solution contain one molecule of the red chromate. If, therefore, 22 c. c. of solution were used in an experiment, this quantity would indicate the presence of ·7656 gram of ferrous carbonate in the 2 grams of saccharated carbonate. For

$$20{,}000 : 22 :: \overset{\text{6 Molecules of }FeCO_3.}{696} : {\cdot}7656$$

This amount represents 38·28 per cent., which is about the average in good samples. By calculation from the proportions of the ingredients, it should contain 45·5 per cent. of $FeCO_3$.

GINSENG.

BY JOHN R. JACKSON.

The history and uses of the Ginseng of the Chinese are so well known, and are likewise so interesting, that some additional interest may be given to the subject to learn how the trade in this article fluctuates in China. The importations to Canton have of late very much declined, large quantities being now sent to Hongkong, where a process of clarification has been established. The roots are also imported and exported free of duty, while in Canton an import duty is first levied, and in addition to this a coast trade duty, if re-exported to other provinces. Of true Ginseng the produce of *Panax Schinseng*, Nees, three kinds are known in Chinese commerce—Manchurian, Corean, and Japanese. The first of these is the finest, but is scarce, being in fact an Imperial monopoly, so that the very best sorts are not seen in the markets. American Ginseng, *P. quinquefolium*, L., appears still to be taken into China, but it is little appreciated by the Chinese. In America it is not employed as a medicine, and is considered to have no other properties than a simple demulcent.

* The Pharmacopœia number corrected.

LIQUID PEPSIN AND SACCHARATED PEPSIN.

BY E. SCHEFFER.

In my essay upon liquid pepsin (*Amer. Journ. Pharm.*, March, 1870) doubts were expressed about the durability of the preparation during warm weather. Subsequently, as the weather became warmer, I found that a mould was forming in the liquid, the quicker the less perfectly the mucus was separated from it, and also when the bottle containing it was from time to time opened, so that the air could come in contact with it.

To satisfy myself I filtered a fresh prepared liquid repeatedly, until it had become perfectly clear, filled several vials with it, corked them tight and sealed them, with the exception of one which was only covered with paper, and set them aside. When, after about six weeks, I looked at them, I found the vial tied up with paper only, almost entirely filled with a fucoid vegetation, and of the others some had mould on the cork, while a few kept entirely clear and free of mould.

Upon these results I thought it expedient to increase the quantity of glycerin in the preparation to 50 per cent., without changing the proportion of mucous membrane or muriatic acid. The resulting preparation stood the test better during summer, but in a few cases a little mould was also noticed on the cork, although never in the liquid itself. In all cases, however, care must be taken to have the mucus entirely removed from the liquid pepsin, and the sooner it can be and is removed, the better the product will be.

Finding it not as easy to get stomachs in summer as I anticipated, and particularly to get a preparation of pepsin free of acid, as in some cases the physicians wish to have, I endeavoured to make a dry pepsin, which, while available for the dispensing in the form of powder, would serve for the preparation of the liquid pepsin.

Of the different formulas given in divers books treating upon organic and physiological chemistry, I found the one by which the pepsin is precipitated by alcohol the least suitable, as the pepsin obtained in this way had, after being dried, lost its solvent power on albumen.

After having precipitated the pepsin and freed it of water as much as possible, by means of a press, it is mixed in the damp state with a weighed portion of sugar of milk, and rubbed in a mortar until it has become dry. By weighing the mixture again the quantity of exsiccated pepsin is ascertained, and sufficient milk-sugar is added to reduce to such strength, that one grain of the *saccharated pepsin*, as I call it, shall dissolve twelve grains of coagulated albumen. This strength seemed to me the most suitable, as one grain is equal to one teaspoonful of my liquid pepsin, which dose is found by physicians sufficient in most cases.

The pepsin dried without addition of an inert substance could not be dispensed, unless it be in solution, as in that state it cannot be made into powder. When taken out of the press and dried between bibulous paper, it is a very tough substance, resembling parchment paper when dried in thin layers, while in thick pieces it looks more like sole-leather; it has a yellowish or greyish brown colour. In water it swells up considerably, and after some time disintegrates itself to white flakes, which float at first and then settle. Although easily soluble when freshly precipitated, it dissolves, after being dried, very little in cold water, more in water of 80°, but very quickly by addition of a little acid. It is therefore necessary, when saccharated pepsin is prescribed in solution, to add a little acid, hydrochloric or lactic. To make liquid pepsin from the dry saccharated pepsin, I propose the following formula:—

℞ Sacch. Pepsin, 64 grs.
Water, 5 fl. oz.
Hydrochloric Acid, 1 fl. drm.

Shake in a bottle until the milk-sugar and pepsin are completely dissolved, then add glycerin 3 fl. oz. and filter. A colourless liquid is formed, of which 1 fl. oz. dissolves $1\frac{1}{2}$ drms. of coagulated albumen.

As the normal gastric juice of man and animals contains chloride of sodium, I tried to ascertain if the addition of a little table salt to a solution of unmixed pepsin in acidulated water would accelerate the solution of coagulated albumen; the result was, that pepsin with chloride of sodium dissolved albumen much quicker than without it. I therefore mention here that chloride of sodium is added to the saccharated pepsin.

As for the strength of saccharated pepsin, compared with the other dry pepsins in use here, it was found that 1 part of it equalled about $3\frac{1}{2}$ parts of Boudault's, 8 to 9 parts of Grimault's, 12 parts of Hawley's, and at least 40 parts of Houghton's. During a period of from three to four hours, 10 grains of saccharated pepsin in 1 fluid ounce of water, acidulated with 10 drops of muriatic acid, and kept at a temperature of 100° to 105° F., dissolved 120 grains of coagulated albumen. Under identical conditions, 60 grains of Boudault's pepsin* dissolved the same amount; 40 grains of Boudault's pepsin dissolved the same amount; 30 grains of Boudault's pepsin did not quite dissolve it; 60 grains of Grimault's pepsin dissolved but 84 grains; 60 grains of Hawley's pepsin dissolved but 60 grains. With Houghton's pepsin, most of the little cubes into which the coagulated albumen was cut had not even lost their sharp angles and corners.

To substantiate the assertion made in my essay on liquid pepsin (*Amer. Journ. of Pharm.*, March, 1870) that wine of pepsin and all other preparations of pepsin containing alcohol were devoid of digestive power, I made the following experiments:—Two equal quantities of dry pepsin were dissolved in acidulated water, and to one of them, after solution, one-third of alcohol was added. The same amount of coagulated albumen was put into each bottle. By the time that the albumen in the vial without alcohol was entirely dissolved, the albumen in the other one was not acted upon, and the little cubes had retained their shape. Dry pepsin, precipitated with alcohol from its solution, was dissolved in acidulated water and coagulated albumen added to it; a solution of my dry pepsin was likewise made, and the same quantity of albumen added. The pepsin made with alcohol did not seem to act at all on the albumen, which appeared to be exactly the same in shape and bulk as when it was put in, when my pepsin had dissolved the albumen entirely.

It seemed to me of importance to find if pepsin made from calf rennet was identical with that made from the hog. I therefore prepared liquid pepsin from rennet in exactly the same way and the same proportions as from the mucous membrane of the hog's stomach. When compared with liquid pepsin as to its digestive strength, it was found that pork pepsin dissolved about one-third more of coagulated albumen than calf pepsin in the same time. With dry pepsin made from rennet I obtained the same result. By experimenting with lean beef meat the difference was still more in favour of the pork pepsin, as a certain quantity of beef was dissolved by this, while the calf pepsin had loosened the fibres and softened the meat, but the bulk was not appreciably diminished.—*Amer. Journ. Pharm.*

* The Boudault's pepsin I had used for experiments last winter must have been adulterated or spoiled, as I recollect right well that it was a damp, sticky powder of somewhat different colour from the one I used this time; therefore its strength, compared with the liquid pepsin, was found so much less than in the present experiment.

THE MICROSCOPE IN PHARMACY.

Dr. Hale (*American Journal of Microscopy*), in speaking of the value of the microscope to the pharmacist, says that the deterioration to which many drugs are subject by being long kept may, in a great number of instances, be traced to the agency of animalcula. In speaking of fungi he remarks:—

Unless the preserved substance can be kept absolutely free from moisture, its surface, and even its deepest interior, will become infected with fungi that more or less rapidly destroy the integrity of its tissues, until the preparation made therefrom is useless as a medicinal agent. The leaves of *Atropa Belladonna*, the seeds of the *Conium maculatum*, and various other powerful narcotic and poisonous substances are probably rendered inert by the destructive process set up in their interior by fungi which obtain access to them.

These injurious changes are not discoverable to the unaided vision. It is notorious that the most carefully prepared tinctures and extracts of certain drugs are sometimes devoid of medicinal power. It has been supposed that certain volatile constituents escape from the substances from which such tinctures are prepared; but of this we have no certain proof. Why is it that the leaves of *Belladonna* may in some instances be kept for years, and at the end of that period be capable of yielding a reliable preparation, while other specimens, when kept only a few months, are worthless? It must be because of some destructive process going on in the substance, which cannot be discovered with the naked eye.

In some of my experiments with the microscope, I have been able to detect the utter worthlessness of the leaves of *Belladonna* and *Digitalis*. In place of the healthy tissue, a mass of fungi appeared to monopolize the place. A thin section of the root of aconite, placed under a low magnifying power, has revealed the presence of such a quantity of fungi as to render the specimen worthless for the pharmacist. In other cases the substance of the root examined would be found destroyed by some insect, which had left only the *debris* of the tissue it had digested or destroyed in its migrations. The pharmacist should first learn to recognize the natural healthy appearance, under the microscope, of all the vegetable substances he works upon; then he should subject a specimen of every substance he prepares to a careful examination, and if he discovers the presence of vegetable or animal parasites, such substance should be rejected. The world is flooded with inert medicinal preparations. Doubtless many such preparations are made worthless by improper methods of manufacture; but it is my opinion that in many instances their worthlessness is due to the fact that the substances used have been injured by certain agencies which could have been discovered by the intelligent use of the microscope.

THE DOSE OF CHLORAL HYDRATE.

The editor of the *Practitioner* for February makes the following remarks concerning large doses of chloral hydrate:—

Two remarkable instances of very large doses of chloral hydrate being taken with only transient effect have come under our notice within the last two months, and, singularly enough, in the same house. A lady was attacked with acute mania; sleep could only be procured by chloral hydrate and a mixture was provided, of which four tablespoonfuls (containing 30 grains) were to be taken every night. Against the plainest orders, the attendants gave four times this quantity (containing 120 grains) one night. Continuous sleep for twelve hours followed, but no evil effects occurred. Singularly enough, the husband of the lady was attacked with delirium tremens, and took, by mistake, either 150 or 180 grains of chloral hydrate. He slept continuously for about twenty-four hours, and even after this could only very gradually be roused—falling asleep in walking, and even on horseback. But his delirium tremens was cured.

On the other hand, we must never forget that some patients are much more sensitive; as *e.g.* the patient mentioned by Dr. Reynolds in the *Practitioner* some time ago, who nearly died from a dose of 50 grains. It is never safe to commence with doses of more than 30 grains.

SOLUTION OF SANTONINE.

BY JOHN HARLEY, M.D.

In a short article in the *Practitioner* for February, Dr. Harley calls attention to the insolubility of santonine, which considerably impairs its utility as a vermifuge. Water cold or warm takes up the merest trace. Chloroform, absolute alcohol, the strongest acetic acid, turpentine, hot olive oil, and hot glycerine are the only simple fluids that dissolve any appreciable quantity. It separates from the oil and glycerine on cooling; water added to the other solvents produces the same result.

Having investigated the subject, Dr. Harley found, after a good deal of trouble, that a useful solution might be obtained by means of carbonate of soda. The following is the formula:—

℞ Santonini, in pulvere, gr. xij
Sodæ Bicarbonatis gr. xx
Aquæ Destillatæ ℥iij.

Put the soda and water into a flask, keep the fluid near the boiling-point, and add the santonine about two grains at a time until the whole has dissolved. Solution is effected in about half an hour, during which time the water is reduced to ℥ij, or if not, may be reduced to that bulk, when ℥j will contain a full dose—six grains of santonine.

The solution is bright and permanent, strongly alkaline, free from odour and, except that of carbonate of soda, taste. Carefully neutralized with acetic acid, an equally bright and permanent solution is formed. Both may be diluted to any extent with hot or cold water without impairing the solution of the santonine. The whole or nearly the whole of the santonine is precipitated in its original form of colourless rectangular plates, with bevelled edges, immediately by mineral acids, and after some hours by excess of acetic acid.

Mixed with acid urine, sp. g. 1017·5, containing excess of uric acid, and kept for several hours at 100° F., no turbidity is produced, unless in the case of the alkaline solution and an excess of phosphates in the urine, when a slight cloudiness may occur from the separation of the latter. This proves that excess of uric acid fails to cause a deposition of santonine.

In cases where powders are objected to, a pleasant mixture may be made by adding a little syrup and flavouring water to the solution of santonine.

SPIRITUS SALIS DULCIS.

In reply to a correspondent in Newhaven, asking for a formula for *Spiritus Salis Dulcis*, as used many years ago, the editor of the *American Journal of Pharmacy* says:—It is a sweet spirit of (common) salt, just as sweet spirit of nitre is of saltpetre. Each was originally made by distilling the respective salts with sulphuric acid and alcohol. This name was officinal in the Edinburgh Pharmacopœia of 1722, and applied to a spirit of hydrochloric ether obtained by distilling a mixture of one part of muriatic acid and three parts of alcohol, after digesting the mixture for several days, and redistilling the product one or more times, until free from acid. This is probably what was used under that name.

In the Prussian Pharm. of 1847, a sort of spirit of chloric ether, under the name *Spiritus Ætheris Chlorati*, is made by distilling 16 parts of chloride of sodium, 6 parts of binoxide of manganese, 12 parts of sulphuric acid, and 48 parts of stronger alcohol, sp. gr. ·813. The acid and alcohol are to be carefully mixed and poured on the salt and oxide, previously placed in a large retort, and the whole mixed; a well-refrigerated receiver being adapted, forty-two parts of distillate are obtained by means of a sand-bath heat. To free the product from acidity, it is shaken with about half a part of calcined magnesia till neutral and then redistilled. Sp. gr. ·815 to ·820. This product has also been called *Spiritus Salis Dulcis*.

The French use a preparation called *Esprit de Sel dulcifié*, which is a simple mixture of 1 part of muriatic acid and 3 parts of alcohol.—*American Journal of Pharmacy*.

PHARMACEUTICAL INFELICITIES IN ENGLAND.

Under the above title, the following editorial note appears in the Chicago *Pharmacist* for January:—

Our city and country are not the only places where physicians and apothecaries sometimes disagree, as we learn in perusing our foreign exchanges. A bitter wordy strife, instigated by the attacks of the *Lancet*, has been waged for some time between these highly respectable and scientific bodies, and, as usual in such cases, some tender spots have been bared on either side. The physicians are incensed at the extent to which counter-prescribing is carried on by pharmaceutical chemists, and incidentally aver that the charges upon their prescriptions are extortionate.

We must acknowledge that on the first ground the physicians have just cause of complaint. The system of combining the vocations of prescriber and dispenser can scarcely be said to exist in this country. It is condemned by our pharmaceutical associations, and no member can indulge in such a practice without violation of the ethical code.

We regard this as eminently just and proper; and however much our English brethren may exceed us in some respects, they are certainly far behind in this.

The discussion has naturally brought forward some of the shortcomings of certain doctors of fair repute, and it seems that they are fully up to the standard allotted to quackery in our own community. We allude to the practice of certain so-called physicians who, from private motives, well understood by the favoured but equally unscrupulous apothecary, designate preparations by secret names or hieroglyphics, which to the uninitiated are about as intelligible as so much Chinese.

A certain Watson Bradshaw having indited such a prescription, which went astray, a copy of it was sent to the London PHARMACEUTICAL JOURNAL for publication and elucidation. The latter request could not be complied with of course, but its publication called forth a note from the prescriber, correcting the "false Latinities" which the published formula ascribed to him. This the editors allowed to pass unnoticed, whereat the critical Bradshaw waxed wroth, and demanded an apology or satisfaction. The editors kindly granted him the latter by publishing a *facsimile* of the original prescription. The writing is itself a curiosity, and scarcely more intelligible than the ingredients of his prescription. The eminent Bradshaw has now no cause of complaint, since full justice has been rendered him—a justice which he doubtless enjoys, as did a certain Shylock in urging his rapacious claim.

Bleaching Sponges.—Sponges can be bleached by first soaking them in hydrochloric acid, diluted with $1\frac{1}{2}$ parts water, until no more carbonic acid is given off; then wash in pure water, and afterwards leave in a bath composed of 2 lb. hyposulphite of soda, 12 lb. water, and 2 lb. hydrochloric acid. If the sponge be afterwards dipped in glycerine and well pressed, to remove excess of liquid, it remains elastic, and can be used for mattresses, cushions, and general upholstery. Sponge mattresses prepared in this way are now finding great favour. It is, of course, not necessary to bleach the sponge where it is intended to be used for such purposes. —*Journal of Applied Chemistry*.

Pills of Sulphate of Quinine.—In order to ensure the solubility of quinine when made into pills, M. Cazac (*Rev. Méd. de Toulouse*) proposes to mix the sulphate with tartaric acid. This had already been recommended, but the quantity of acid proposed was too large. M. Cazac uses one part of tartaric acid to five of sulphate of quinine, making up the pills with conserve of dog-rose.—*British Medical Journal*.

Parasite on the Lemon.—At a recent meeting of the Scientific Committee of the Royal Horticultural Society, Mr. Alfred Smee exhibited some lemons from Sicily which had been attacked by a species of *coccus*, quite distinct from the well-known coccus of the orange, and apparently an undescribed species. It was stated that nearly the whole of the lemon crop in Sicily is attacked by this parasite, which renders it almost valueless for the English market. Although the juice is not much affected, the skin is completely spoiled, and rendered uncrystallizable. The root appears to be at the same time attacked by a fungus.—*Nature*.

Eucalyptus Leaves.—The Rev. M. J. Berkeley mentions in the *Gardeners' Chronicle*, on the authority of a letter received from Cannes, that Dr. Gimbert has introduced a new method of dressing wounds by using eucalyptus leaves in the place of lint. The leaves, which have a "catty" smell, are merely laid on the wounds. The balsamic nature of them not only cures, but after a few hours all the unpleasant odour of the matter ceases.

Incompatibility of Quinine and Veratrum Viride.—Dr. Bradly, of Marys, Ohio, reports that when a patient is under the influence of *Veratrum viride*, it is highly dangerous to administer quinine. The effects are most alarming, immediate sinking and irregularity of the pulse, which in some instances reaches collapse. He ran great risk of losing three patients before he became aware of the actual cause.—*Medical and Surgical Reporter*.

DRUG MARKET NOTES.

The following are a few of the principal parcels of drugs offered for sale lately:—

Rhubarb, 167 chests; China, 80 cases.
Cantharides, 2 cases.
Nutmeg Oil, 9 cases.
Musk,—Tonquin, 77 caddies; Grain, 4 caddies.
Musk Skins, 1 package.
Squills, 54 bags.
Ergot of Rye, 5 barrels.
Bark,—Calisaya, 94 serons; Soft Columbian, 286 serons; Red, 7 cases; Yellow, 56 serons; Pitayo, 52 bales; Crown, 27 serons.
Castor Oil, 250 cases; Italian, 20 cases.
Jalap, 16 bales.
Honey, Chilian, 89 casks.
Cod-Liver Oil,—Newfoundland, 88 casks; Norwegian, 57 casks.
Patchouli Leaves, 6 bales.
Blackboy Gum, 30 casks.
Japan Wax, 324 boxes.
Orris Root, 1 cask.
Aloes,—Cape, 46 cases; East Indian, 29 cases, 7 boxes.
Cardamoms,—Malabar, 32 cases.
Ipecacuanha, 16 serons and 1 case; Carthagena, 6 barrels.
Chiretta, 75 bales.
Cassia Fistula, 8 cases and 47 bags.
Canella Alba, 15 packages.
Camphor,—China, 115 cases.
Ambergris, 7 tins and $5\frac{1}{2}$ oz.
Turmeric—Madras, 320 bags.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 18, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REGISTER FOR 1871.

THE Register of Chemists and Druggists for the present year having been just issued, we take the opportunity of calling our readers' attention to some points in connection with its compilation.

The Register contains about five hundred new names, most of which are those of persons who have passed the Modified Examination. Although every care has been taken to make the list as perfect and complete as possible, some errors still occur in it, the correction of which must rest with the persons registered or those acquainted with them. Many names are registered at addresses which were correct at the time registration was effected, but of the incorrectness of which at the present time proofs are of frequent occurrence. This defect arises principally from the neglect of registered persons to apprise the Registrar of any change of address. This is the more important from the difficulties that may arise from such neglect. Clause 10 of the Pharmacy Act, 1868, enacts that, "to enable the Registrar duly "to perform the duties imposed upon him, it shall "be lawful for the Registrar to write a letter to any "registered person addressed to him according to his "address on the Register, to inquire whether he has "ceased to carry on business or has changed his residence, such letter to be forwarded by post as a "registered letter, according to the Post Office regulations for the time being, and if no answer shall "be returned to such letter within the period of six "months from the sending of the letter, a second of "similar purport shall be sent in like manner, and "if no answer be given thereto within three months "from the date thereof, it shall be lawful *to erase* "*the name of such person from the Register.*" As by the same Act it is provided that the Register shall be sufficient evidence in all courts of law, and that the absence of the name of any person from such printed Register shall be deemed evidence, until the contrary is proved, that such person is not registered according to the provisions of the Pharmacy Act, and as a copy of the Register is supplied for that purpose to all the principal law courts in the kingdom,—it will be seen how important it is that each person registered should secure the correctness of the entry relating to himself.

Another cause of error is that arising from unreported deaths. Notice of the deaths of registered persons should be given by the Registrars of Deaths in the district in which they occur. The neglect of this duty, however, is very frequent, and the Registrar has to rely upon the local secretaries or private sources for this information.

THE current number of the *Chemist and Druggist* contains a Pharmaceutical Sermon, in which Mr. JOSEPH INCE, taking his text from Ecclesiasticus xxxviii. 1–4, defends himself against the criticism of our contemporary the *British Medical Journal* in reference to the publication of prescriptions with the names of their authors. In quoting the opinion expressed by that journal, we did not presume to offer an opinion as to whether it is right or wrong or necessary to so publish names, for if it be an offence to do so, we must confess to being in some degree *participes criminis*, and we now refer to the matter again chiefly because Mr. INCE appears to imply some censure for having inserted a brief statement of the objection raised by the *British Medical Journal*, though we think he will perceive on reflection that, as a representative of the medical profession, its opinion on the point is entitled not only to consideration, but also to publicity in our columns.

IN the House of Commons, on Monday night, Mr. BRUCE said, in answer to a question put by Lord EUSTACE CECIL, that it was not the intention of the Government to propose legislation concerning the adulteration of food and drugs this session. On Wednesday Mr. MUNTZ gave notice of his intention to bring in a Bill to amend the law for the prevention or adulteration of food and drink and of drugs.

PROFESSOR FRANKLAND has accepted office as President of the Chemical Society for the ensuing session.

AT a preliminary meeting held at King's College, it was decided that a fund should be raised for a memorial to the late Dr. MILLER, who, for thirty years, laboured in connection with the College. It was also resolved that a Committee should be formed for the purpose of obtaining subscriptions and carrying out the necessary measures.

THE Canadian Pharmacy Bill, which, in consequence of the press of business, was "discharged" last session, has been again brought before the Canadian Legislature. It has been read a first and second time, and referred to a select committee. From the discussion which took place at the meeting of the Ontario College of Pharmacy, it would appear that the principal obstacle in the way of the passing of the Bill was a clause proposing regulations concerning the sale of proprietary medicines. This was ordered to be withdrawn. It is curious to notice that the same confusion in the use of the term "patent medicine" exists in Canada as in this country, in its application to secret nostrums, whereas the essence of a patent medicine is, that the formula shall be known and deposited with the proper authorities.

The proposed typographical changes in the *Chicago Pharmacist* have been effected in the first number of the fourth volume, just received. Notwithstanding the increased quantity of matter, the journal, in its new form, has a decidedly handsome appearance.

The *American Journal of Pharmacy* announces that proof sheets of the volume containing the Proceedings of the American Pharmaceutical Association at the Baltimore meeting have been received, and that its publication may be expected very shortly.

The Annual Meeting of the Philadelphia College of Pharmacy is to be held on Monday, March 27.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

February 10th, 1871.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden and Ince.

Dr. Greenhow was also present, on behalf of the Privy Council.

MODIFIED EXAMINATION.

Forty-two Candidates presented themselves for examination; the following passed and were registered as

CHEMISTS AND DRUGGISTS.

Banbury, William Walter	Burford.
Batty, Thomas	York.
Brunton, William Walker	London.
Burton, Joseph	Southampton.
Cadby, Samuel Kittle	Margate.
Crisswell, Frederick	Seaforth.
Davies, Samuel	Liverpool.
Evans, Daniel Ogilvie	Halstead.
Field, Henry	Brighton.
Fox, George Clement	London.
Gibson, Reuben Leonard	Loughborough.
Graves, Joseph Waddington	Reading.
James, David Owen	Newport, Pembroke.
Johnson, Arthur	Rotherham.
Kiddle, James	Bristol.
Kimber, James	Stamford-in-the-Vale.
Legg, Matthew Henry	London.
Logan, Francis	Pembroke Dock.
Mason, Thomas	Nottingham.
Mitchell, Charles Edward	Tunbridge Wells.
Palmer, Henry James	Hulme.
Phillips, Thomas Madocks	Haverfordwest.
Roberts, James	New Brighton.
Sirett, Henry	Buckingham.
Smith, Joseph	Kilnhurst.
Smith, Lucius Jeffreston	Wortley, Sheffield.
Strachan, Binny	Wimborne.
Toy, George Bentley	London.
Watts, Walter	Peterborough.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A General Meeting of the above Society was held on Wednesday, January 25; the Vice-President, Mr. E. Nuthall, in the chair.

The Chairman said, before proceeding to the business of the meeting, as specified by the public notice, he thought it would be well briefly to review the progress of the Society since their last meeting.

In the first place they had been favoured by Mr. Sutton with two excellent lectures on Chemistry—lectures that, although adapted to the requirements of the juvenile members, had been highly instructive to all, and thoroughly illustrated by most interesting experiments.

For information respecting the library and museum, he would refer them to their treasurer, Mr. Butler, who had been acting as secretary, merely noticing the great obligation that the Society was under to Thomas Hyde Hills, Esq., for supplying them with the nucleus of a library.

With the exception of a fortnight at Christmas, the four weekly classes had been regularly held, and he only regretted that the attendance had not been regular as well, for with the exception of the Latin class, the number of students had fallen off considerably. This was a circumstance greatly to be regretted, not only because it showed an indifference to their own interests, but also to those of the Society, for it could only be discouraging to those who promoted the design and had been taking the duty of conducting the affairs of the Association, to find that their primary object, viz. the diffusion of the knowledge so essential to the *status* of a chemist, was passed over, and almost entirely neglected by the majority of members. He wished that all those who had not passed their examinations would set to work and strive to rival the success of one amongst them, Mr. King, who had just been placed first on the list of those who had that month passed the Preliminary.

Before proceeding to the election of the new councillors, he could not help expressing regret at the great loss they had experienced in the resignation (through change of situation) of two such useful members as Messrs. Lincoln and Perkins. Of the latter, with whose courtesy and constant attention to the affairs of the Society they were all so well acquainted, he could not speak too highly. Besides, he had a further claim upon their thanks, in the fact that he was one of the first to suggest the formation of such an Association.

Mr. Butler rose to propose a vote of thanks to their late Secretary, Mr. Perkins; in so doing, he observed how much he regretted the loss of that gentleman's valuable services, from which the Society had so greatly benefited since its formation. He had himself been called upon to work much with Mr. Perkins in the business of the Society, and had always noticed how heartily he had entered into the various duties incumbent upon him, which, as might be imagined, were not always of a trifling character.

Mr. Martin, in seconding the vote, begged heartily to concur with Mr. Butler's remarks, and hoped that an expression of the feeling of the meeting would be conveyed to Mr. Perkins. The vote was then carried with applause.

Mr. Butler stated that he would communicate the result of the meeting to Mr. Perkins. In reference to the library and museum, the Council had selected a Sub-Committee to make all the necessary arrangements for the carrying out of their original plan, and they hoped shortly to be able to show a beginning in the museum, as the requisite furniture was already ordered. In the collection of specimens all members could, and he trusted would aid; the Museum Committee would be glad to receive any good crystals, or characteristic specimens of organic materia medica. They also desired to show the various adulterants. With regard to the donation they had received from Thomas Hyde Hills, Esq., part of the books purchased with the above donation of £5 would be to hand in a few days, and would then be allowed to circulate. Mr. Hills had also kindly presented to them copies of the portraits of the late Mr. Jacob Bell, Dr. Pereira, and Mr. William Allen. The grant from the Pharmaceutical Society, of which they had already heard was in part disposed of in purchase of those diagrams now of so much service to the botanical class. They intended shortly to expend the remainder in the purchase of chemical diagrams. He had been requested to notice the falling off in the attendance at the various classes. It had caused him much pain and surprise that those for whose benefit they were carried on should not have more earnestly availed themselves of their advantages. It was quite unnecessary to enlarge upon these advantages, under the present system of compulsory examination, but he would remind them that they were throwing cold water on the efforts of those gentlemen who had so kindly given up much of their time, not only for the actual delivery of the lectures, but for their preparation. He trusted that those present would incite the habitual absentees, and that in the future there would be a marked improvement.

The Chairman stated that Mr. Butler had consented to act as Financial Secretary.

Mr. Grimditch was elected Secretary.

The meeting closed with a vote of thanks to the Chairman.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eleventh *Conversazione* of the Liverpool Chemists' Association was held on Thursday evening, February 3, at the Royal Institution, Colquitt Street, and was very numerously attended. The entire building was thrown open to the company, and the many objects of interest in the collections connected with the institution were supplemented by others lent for exhibition on this occasion by various private gentlemen and public societies.

Mr. Albert H. Samuel, several times during the evening, explained and illustrated experimentally Tyndall's theory of the blue colour of the sky. He prefaced his explanatory remarks by shortly noting the fatal objections to the other theories previously accepted, and then proceeded to explain that all space is filled with an extremely subtle and elastic medium to which the name "ether" is given. He then defined *light* as the result of an infinitely rapid vibratory motion of the molecules of luminous bodies, such as those of the sun. These vibrations give to the ether a wave-like motion, which striking on the retina of the eye produces a certain sensation which we call light. The waves of ether are of different lengths and amplitudes. The greater the amplitude the more intense the light. It is the difference in the length of the waves, which gives us the impression of different colours, *blue* being caused by the shortest waves, and *red* by the longest. The long red waves have also a much greater amplitude or depth than the short blue waves, and are thereby enabled to roll over or pass by small obstacles which would interrupt and throw back the short and shallow blue waves. He then stated that our atmosphere is supposed to be filled with countless millions of excessively minute particles, in a state of suspension, and that the long deep red waves *roll* or *pass over* these small particles, but the short shallow blue waves are stopped by them, and thrown back or scattered into space, to which they communicate the blue appearance which we call sky. He then proceeded to demonstrate this theory by drawing the attention of his audience to a large glass vessel of water in which he had suspended, by means of an alcoholic solution of gum mastic, an infinite number of minute particles of the gum.

On bringing the powerful light of a magnesium lamp to bear on the particles, the water at once assumed the characteristic blue appearance of the sky,—the water representing the ether, and the suspended particles of gum, the infinitely minute particles floating in our atmosphere.

In the course of the evening the company assembled in the Lecture Theatre, to listen to an address by Professor Roscoe, illustrated by experiments on "Solar Chemistry."

Mr. Abraham, who occupied the chair, in introducing the lecturer, reminded the audience that fifty years ago the institution in which they were assembled was opened by William Roscoe, the most distinguished ornament to literature the town had produced. Professor Roscoe, however, might be introduced upon his own merits.

Professor Roscoe, after thanking the meeting for the flattering manner in which it received him, and the President for the kind way in which he spoke of his honoured grandfather, said,—The science of astronomy was most important. The sun had, from the earliest times, attracted attention, and even worship; but very little had been known concerning it until within the last few years. Recently, however, this knowledge had increased. Now we know something, not only of its physical constitution, but of its chemical composition; that the sun contains substances found on the earth; that iron, magnesium, and many other elements are present in the solar atmosphere. When it was remembered that the sun was 91,000,000 miles distant from the earth, it seemed a marvel that such information could be obtained. Light and heat form the only medium of communication between this world and the sun. It was by examining the light emitted by the sun that the composition of the solar mass could be ascertained. White light is a compound, whereas coloured light is a simple phenomenon. If light were of only one colour, or monochromatic, colour would not be seen at all, but would appear as different degrees of shade. With the aid of the spectroscope, the professor illustrated the different characteristics of the solar rays. The glowing vapours of the gases were beautifully shown, also the broken spectrum caused by throwing lithium through the prisms, and the effect of thallium. He next volatilized several metals, such as silver, copper, cadmium, tin and sodium, and showed the lines produced by each, observing that, however distant a light might be, it could be ascertained what metal produced it. He then said that there were blue and orange-coloured stars, showing a different kind of light, and the lines produced by them were different from those produced by the sun; while those produced by the planets and the moon, being from borrowed light, were the same, showing that these stars were self-luminous. Kirchhoff came to the conclusion that metallic vapours existed in the solar atmosphere, and that certain lines in the solar spectrum were due to the presence of metals in it. Since Kirchhoff's discovery, their knowledge of the sun had greatly increased. The lecturer next proceeded to explain a few of the phenomena attending a total eclipse of the sun. He said they were most marvellous and difficult of explanation. By means of diagrams he illustrated the red prominences observed during a total eclipse. The Himalaya expedition in 1860, proved that these protuberances belong to the sun. They consist of glowing masses of hydrogen, many of which are supposed to extend 80,000 or 90,000 miles, and move with wonderful rapidity. Speaking of the corona or white halo of light seen outside the sun during a total eclipse, the irregular form of which extended into space, he said the result of the recent eclipse expedition was, on the whole, satisfactory; for in spite of bad weather, accidents and mishaps, the corona had been run down at last, and it was pretty well known what it was. If, however, the astronomers had been favoured with fine weather an important series of observations would have been made at Syracuse. Some of them went up Mount Etna, and saw nothing. About half an hour before the eclipse a snowstorm set in; half an hour after the eclipse was over the weather was most beautiful, the sun shining forth in all his brilliancy. There was no doubt that the corona did belong to the sun. The light from the corona gave a spectrum containing bright lines, one of which was observed by an American astronomer during the eclipse last year. This line does not coincide with any of those found in the spectra of other known elementary substances. A similar bright line is, however, found in the spectrum of the aurora-borealis. Whether they were connected could not be said at present; that is a point for future observers to clear up. It had been enough for them, during the last eclipse, to fix the corona as an absolute entity, and show that it was not merely something produced in the eyes of the observers by irradiation of any glare, but a portion of the solar body. Professor Roscoe concluded his lecture by thanking his audience for the attention with which they had listened to him, and resumed his seat amid loud applause.

A cordial vote of thanks was presented to the Professor for his lecture.

Later in the evening, Mr. Edward Davies, F.C.S., Vice-President of the Association, gave a short but instructive lecture, with experiments, upon modern explosive compounds, including the different kinds of gunpowder, gun-cotton, nitro-glycerine, dynamite, picrate of potash, percussion shells, time fuses, and percussion fuses.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An Ordinary Monthly Meeting was held in the Memorial Hall, Albert Square, on Friday afternoon, February 3rd; Mr. G. S. Woolley in the chair.

Messrs. Berry, Eckersley and Warton, all of Oldham, were elected members; and Messrs. Woodcock, Spenceley and Bowsfield, associates.

A donation of three guineas, to form a prize in one of the classes selected by the Council, was announced from a member, Mr. T. G. Gibbons, and a resolution conveying the best thanks of the Association to Mr. Gibbons was carried with acclamation.

Mr. Robert Hampson then read a paper "On the Importance of Some Knowledge of Anatomy and Physiology to the Pharmacist." The following is a brief abstract:—

The pharmacist is expected to be fully alive to the requirements of the physician, and conversant with the *modus operandi* of remedial agents. The production of pharmaceutical preparations suited to the varied manifestations of disease necessitates some knowledge of the construction and functions of the human organism. Such knowledge would greatly tend to impress upon the dispenser the absolute importance of accuracy in compounding medicines, and the danger and disadvantage of using adulterated drugs, or drugs not reaching the official standard of potency. The definition of a poison, and the perils of an excessive dose, and the necessity for the use of all suitable safeguards to prevent error or disastrous misadventure, would assist in putting to flight the mistaken notion, that the rigid machinery of law, its penalties and needless rude encroachments are required to ensure the safety of those who deal with us.

It might be argued by some that this kind of knowledge would extend the practice of prescribing by druggists; he (Mr. Hampson) entertained an opposite opinion, founded on the conviction that this particular information which reveals to us that our bodies are indeed "fearfully and wonderfully made," has a tendency to prevent, rather than foster the rash assumption of duties foreign to our special business.

Mr. Hampson illustrated his subject by some remarks on the minute anatomy of the skin and mucous membrane, and their use in the animal economy, and also on the various methods of introducing medicines into the circulation.

In conclusion he advocated that a short introductory course of lectures, embracing a clear outline of anatomy and physiology be given to pharmaceutical students.

A cordial vote of thanks was passed to Mr. Hampson for his interesting paper.

Some discussion then took place on the latest phase of the poison regulations question, and a resolution proposed by Mr. Siebold and seconded by Mr. Mumbray, was carried, "That the consideration of this subject be referred to the Council of this Association, and that they be requested to take action thereon."

The Secretary called attention to a copy of the Year-Book issued by the Pharmaceutical Conference, which he had placed upon the table, and reminded those present that all apprentices and assistants, as well as men in business, were, on payment of the annual subscription of 5s., eligible for election as members of the Conference, by which they would be entitled to a copy of this valuable work.

A paper on Dispensing, by Mr. Halliday, was announced for the March meeting,

BRISTOL PHARMACEUTICAL ASSOCIATION.

A General Meeting of the Association was held on Friday, February 10th, for the purpose of taking into consideration the subject of the proposed "Regulations for the Storing of Poisons."

The President, Mr. Stoddart, briefly introduced the subject, pointing out that the poison clauses in the Pharmacy Acts were really all that the public and the Government cared about, and that they had shown a remarkable confidence in the pharmaceutical body in trusting to their hands the carrying out of their provisions. He thought the pharmacists were bound in honour to fulfil the implied pledge to adopt some compulsory regulations as to the storing of poisons, and that those suggested by the Council were sufficiently elastic to be easily applied to all kinds of pharmaceutical businesses.

Mr. Giles said he had endeavoured to approach the subject with a perfectly unbiassed mind. He had hitherto identified himself with neither side in this controversy, feeling a good deal disposed to trust the judgment of the Council, and to follow their leading. Looking at the question in the abstract, and having regard to the history of the sad cases of accident that all present would recollect, he thought the public had a distinct right to some security against such accidents beyond those provided by the best professional education; and this view naturally issued in the imposition of compulsory precautionary regulations. Those that had been put forth by the Council, with the concurrence of the Privy Council, he considered, were very sensible and very easy of application, and their adoption would, he was sure, act as a great relief to many an anxious dispenser. Moreover, by thus offering a further pledge of safety to the public, the pharmaceutical body would be adopting the course most calculated gradually to draw the bulk of dispensing into their own hands. Mr. Giles then read a circular he had that day received from Mr. Bremridge, which detailed the history of the Council's action in the matter, and explained its present intentions, and he concluded by declaring that he utterly failed to discover any ground for objection to the course it had taken.

Mr. Boucher (Ferris and Co.) confessed he felt no very great faith in the efficacy of "compulsory regulations," as he thought most establishments already practised such precautions as were best adapted to their own particular circumstances; and looking at the exceeding infrequency of accidents in the houses of pharmacists, he did not think they were required. But as something of the kind appeared to be demanded by a portion of the public, and by the Privy Council, he would by no means oppose them.

Mr. Schacht said he had always noticed that those who had the largest experience in dispensing were amongst the most anxious to avail themseves of all possible precautions, whether mechanical or moral, against accidents. He was desirous to do so also; and, indeed, with Mr. Boucher, believed there were but few pharmacists throughout the country who not only felt as earnestly upon the matter as he did himself, but who would have approved these "regulations" warmly, had they only been presented as "recommendations." He believed that what had produced the show of opposition to them was the fear that, as the existing legal power to enforce their observance was manifestly insufficient, the adoption of them as compulsory would be tantamount to a pledge to support some further legal enactments, which, to be efficacious, must of necessity be inquisitorial. This view had presented itself strongly to his own mind, though he had never before publicly expressed it, and had made him regard the whole business, highly as he approved the substance of the regulations, with a good deal of distrust. He could not endure the notion of inspection, and yet without it he could not see how these "regulations" could be rendered compulsory. There was a sentence in the circular the meeting had just heard read, which he interpreted as a disclaimer on the part of the Council of any intention to push what legal power they possessed to a vexatious issue; he should not, therefore, press upon the Association a resolution he had prepared, requesting definite information from the Council upon this very point; but he thought all the more that "compulpulsory regulations," which were not be enforced, had better be called by their proper name—"recommendations."

After a general discussion of a conversational character, in which the details of the proposed regulations were considered, it appeared to be the feeling of the meeting that it was desirable that the agitation upon the subject of poison regulations should be set at rest, by accepting the proposition of the Council of the Pharmaceutical Society, which appeared to satisfy the requirements of the Privy Council. The following resolution was therefore proposed by Mr. Giles, seconded by Mr. Boucher, and carried without a division:—"That this meeting approves of the regulations proposed by the Council of the Pharmaceutical Society, in concert with the Privy Council, for the keeping and dispensing of poisons, and authorizes the Council of this Association to take measures at their discretion for supporting the action of the Council of the Society at the Annual Meeting in May next."

HULL CHEMISTS' ASSOCIATION.

At the usual monthly meeting of the Hull Chemists' Association, the proposed poison regulations were discussed, when it was unanimously resolved, "That the attempt to enforce uniformity throughout the kingdom in the keeping and storing of poisons by chemists, would, if successful, be likely in the first instance to result in greatly increased risk by disarranging existing plans, without any probable ultimate benefit to either the public or the trade, and such proposed regulations are in the opinion of this meeting unnecessary."

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

At the Meeting of the Chemical Society on the 2nd of February, Professor Frankland, F.R.S., read a paper on "The Development of Fungi in Potable Water." He first alluded to Mr. Heisch's experiments on waters contaminated with sewage matter. The addition of sugar gave rise to a kind of fermentation, and a rich fungoid growth made its appearance. Professor Frankland, in repeating these experiments, has arrived, with one or two exceptions, at the same result. But he also met with some reactions which were at first difficult to explain. On the 26th of November last, he collected at Mr. Hope's irrigation farm at Romford, a sample of effluent water from one of the drain outfalls. This water consisted of Romford sewage, which had percolated through four or five feet of loose gravelly soil to the tile-drains below. It was clear, but still contained much unoxidized sewage, as was shown by the following results, obtained upon analysis:—

100·000 parts contained—

Total solid impurity in solution	85·600
Organic carbon	0·844
Organic nitrogen	0·233
Ammonia	0·040
Nitrogen as nitrates and nitrites	1·143
Total combined nitrogen	1·419
Chlorine	9·300
Temporary hardness	27·950
Permanent "	20·600
Total "	48·550

The proportion of organic carbon was three times, and that of organic nitrogen ten times, as great as that found in unpolluted water, whilst the comparatively large proportion of ammonia showed that the oxidation of organic matter was still incomplete. Nevertheless, this water, mixed with the proper proportion of sugar, and maintained at a temperature of about 70° F., remained perfectly transparent for weeks. The result of the next experiment was still more remarkable. Two samples of the Grand Junction Company's water were mixed with sugar in the usual way. One of them was drawn from a foul, uncovered cistern over and within a water-closet; the other from a clean slate cistern, and filtered through 30 or 40 lbs. of animal charcoal. The water from the foul cistern remained transparent for weeks, whilst that drawn from the clear cistern through animal charcoal soon became turbid, and in three days produced abundant fungoid growths. To test Mr. Heisch's statement that filtration through *well-aired* animal charcoal prevented these growths even in foul water, Professor Frankland passed a rapid current of air through the filter for about fifteen minutes, and left it exposed to air for six hours. The result, however, was the same; Grand Junction water drawn through it immediately after aeration, when mixed with sugar, behaved exactly as before. These experiments seem to indicate that the presence of a phosphate was in some way connected with the production of the fungoid growths and other living organisms, for it is known that water dissolves traces of calcic phosphate from animal charcoal, and this supposition was strengthened when Professor Frankland found that the effluent water from the sewage farm at Romford contained no detectable trace of phosphoric acid, the plants and poor soil of this newly-cultivated farm having, doubtless, removed all phosphates from the percolating sewage. The hypothesis of the dependence of fungoid and other growths upon the presence of phosphates was further supported by the results of the following experiments:—

A sample of the Grand Junction Company's water mixed with sugar remained perfectly clear for twelve days; minute quantities of ammonic nitrate and sodic phosphate were then added; three days later, it swarmed with very active vibrios and cells with bright nuclei; subsequently very luxuriant branched fungoid threads were developed, the mixture emitting a strong ferment odour, which, a few days later, became horribly offensive.

A sample of the Southwark Company's water mixed with sugar remained for nineteen days perfectly clear; small quantities of ammonic nitrate and sodic phosphate were then added. In a few days it was crowded with vibrios and monads: later it was found to contain the characteristic mycelial fibres.

The usual proportion of sugar was added to a sample of water collected at the Cerney Springs near Cirencester; it remained clear for eight days and was then mixed with traces of ammonic nitrate and sodic phosphate; it continued turbid, and soon became filled with swarms of vibrios and fine branching tubular fungoid threads; the water subsequently became brownish and emitted a very offensive odour.

These experiments show that potable waters, which stand the sugar test perfectly, become entirely changed in their behaviour with this test when mixed with traces of ammonic nitrate and sodic phosphate; and the following experiments prove that it is the phosphoric salt which alters their behaviour in this respect:—

A sample of the Lambeth Company's water, mixed with sugar, remained perfectly clear for nineteen days: ammonic nitrate was then added; after the lapse of several weeks the clearness of the sample had not been disturbed.

Canterbury deep well-water, softened by Clark's process, remained perfectly clear during twenty-three days after admixture with sugar; traces of nitrate of ammonia were then added. After the lapse of two months, it was perfectly transparent and unchanged.

Thus it is evident that the addition of minute traces of a phosphate, either as sodic phosphate, white of egg, or animal charcoal, at once determines these fungoid growths in saccharine water, which before exhibited no tendency to develope them.

The next question to be determined was, are the germs of these organisms contained only in the waters which develope fungoid growths, or are they present in the atmosphere? The answer was given by the following experiment:—

Small quantities of potassic chloride, ammonic nitrate, sodic phosphate and sugar were dissolved in distilled water, previously boiled for many hours with caustic soda and potassic permanganate, and afterwards again distilled. Just before solution the solid ingredients were strongly heated in a platinum spoon over the flame of a spirit-lamp; the potassic chloride and sodic phosphate to redness, the ammonic nitrate until a considerable proportion had decomposed into nitrous oxide and water, the sugar until, after melting, it began to turn brown. This solution was placed in a stoppered bottle. After a few days' exposure to a temperature varying between 60° and 70° F., a magnificent mycelium of the characteristic description began to grow, soon followed by several others. The liquid was also crowded with very minute moving organisms, probably monads. A specimen of real sewer fungus was found to be very similar in appearance, but more transparent and somewhat smaller.

It is thus evident that the purest water which can be obtained in contact with the air yields splendid crops of this sewage mycelium, if it be supplied with the necessary soil, and further, that the sugar and salts just named contain all the elements necessary for its development. Phosphorus is essential, for, in a solution made at the same time, exposed to the same conditions and containing the same substances, *minus the sodic phosphate*, no trace of mycelium or of any other organism made its appearance during nine weeks.

The presence of germs in a sample of water is therefore insufficient in itself to produce Mr. Heisch's reaction when sugar is added. A short (probably a momentary) contact with air is sufficient to impregnate any sample of water with the necessary germs, which develope on the addition of sugar only in the presence of a phosphate. The reaction is, in fact, an exceedingly delicate test for phosphoric acid. It would probably defy the powers of the most expert chemist to detect, in two ounces of water, the phosphoric acid introduced by the addition of a single drop of a dilute solution of albumen; yet these atmospheric germs find it out, appropriate it, and by their growth, reveal its presence.

Professor Frankland then described some experiments in which water, sugar, sewage matter and the necessary salts, were kept in dark or obscure places at the temperature of the body. He found that these conditions were favourable for the development of bacteria, vibrios and similar organisms, but unfavourable for fungoid growth.

As the result of his experiments, Professor Frankland has arrived at the following conclusions:—

1. Potable water mixed with sewage, urine, albumen and certain other matters, or brought into contact with animal charcoal, subsequently develope fungoid growths when small quantities of sugar are dissolved in them and they are exposed to a summer temperature.

2. The germs of these organisms are present in the atmosphere, and every water contains them after momentary contact with the air.

3. The development of these germs cannot take place without the presence of phosphoric acid, or a phosphate or phosphorus in some form of combination. Water, however much contaminated, if free from phosphorus, does not produce them. A German philosopher has said "*ohne Phosphor kein Gedanke*." The above experiments warrant the alteration of this dictum to "*ohne Phosphor gar kein Leben*."

ONTARIO COLLEGE OF PHARMACY.

At the Ordinary Monthly Meeting, held on the 13th of January, the Legislative Committee reported that they had interviewed the Hon. Attorney-General and several other members of the Legislature, and that there seemed to be a general opinion in favour of the Bill, with the exception of Clause 27, into which a provision has been introduced for regulating the sale of proprietary medicines that has caused great opposition.

Mr. Elliott thought that a modification of the clause was advisable; yet there ought to be some provision to prevent the putting up of laudanum and other dangerous drugs under other names, and scattering them broadcast over the country. This, he thought, might be done without interfering with the sale of legitimate patent medicines.

Mr. Margach moved an amendment, authorizing the Committee on Legislation to withdraw the clause, as he felt convinced that an attempt to carry it would imperil the Bill itself. It would be better to get the Act first, and, at some future time, a well-digested scheme for protecting the public from dangerous secret remedies might be introduced.

Mr. Miller, in supporting the amendment, said that it was certainly a very arbitrary proceeding to compel every proprietor of a patent medicine to send the formula to the Registrar. He felt sure that it could never be carried out.

The amendment was carried.

During a discussion on the Poison Schedule, which is similar to that in the English Act, Mr. Miller said that paregoric, being an article of such common use, ought to be made an exception to the articles in Class 2.

This suggestion was adopted, and a committee instructed to carry out these alterations when the Bill again came before the Legislature.

MEETINGS FOR THE ENSUING WEEK.

Monday ......*Medical Society*, at 8 p.m.
London Institution, at 4 p.m.—"The First Principles of Biology" (Educational Course). By Prof. Huxley.
Tuesday ......*Royal Institution*, at 3 p.m.—"The Nutrition of Animals." By Professor Foster.
Wednesday ...*Society of Arts*, at 8 p.m.—"Water Meters." By Frederick E. Bodkin.
Thursday......*Royal Society*, at 8.30 p.m.
Royal Institution, at 3 p.m.—"Davy's Discoveries in Chemistry." By Prof. Odling.

THURSDAY......*London Institution*, at 7.30 P.M.—"The Action, Nature and Detection of Poisons." By F. S. Barff.

London Chemists' Association, at 9.30 P.M. "Filtration." By Mr. De Putron.

FRIDAY ....*Royal Institution*, at 9 P.M.—"The Latest Scientific Researches in the Mediterranean and Straits of Gibraltar." By Dr. W. B. Carpenter.

Quekett Club, at 8 P.M.

Parliamentary and Law Proceedings.

OVERDOSE OF CHLORAL HYDRATE.

An inquest has been held at Wrington, Somerset, to inquire into the death of Mr. Edward Ratheram. It appeared from the evidence that the deceased gentleman had been placed under the care of Dr. Barnes, in consequence of his addictedness to opium. Visiting Bristol with the Doctor, he took the opportunity of purchasing secretly an 8-oz. bottle of chloral hydrate. A day or two afterwards he was observed to be under the influence of an opiate. Being questioned, he produced a bottle containing about an ounce of chloral hydrate, largely diluted with water. The bottle was not marked "poison," but a printed label was attached, giving directions for use. In the evening he took his supper in bed, apparently quite well; the next morning he was found lying on the floor. Medical assistance was obtained, but Mr. Ratheram died shortly after. The medical evidence was to the effect that death had been occasioned by an overdose of chloral hydrate, and the jury found accordingly, adding, that they believed it to have been taken in ignorance of its strength, and that in their opinion narcotic poisons, when sold to non-professionals, should be labelled "Poison."—*Saturday Bristol Times.*

Obituary.

DR. F. A. G. MIQUEL.

Intelligence has been received of the death of Dr. F. A. G. Miquel, Professor of Botany in the University of Utrecht, and Director of the Botanic Gardens at Leyden. Professor Miquel has occupied high rank among systematic botanists for many years. His numerous publications have been principally devoted to the elucidation of the plants of the Dutch possessions in the Indian Archipelago and of the flora of Japan and New Holland. Besides these undertakings, for which Professor Miquel possessed special advantages, he produced several monographs of particular families, such as the Figs, Peppers, Cycads, Casuarinas, etc. The work by which he will be best remembered is his 'Annales Musci Botanici Lugduno-Batavi,' in four folio volumes, with splendid illustrations. He was one of the Foreign Members of the Linnean Society of London.

Petroleum Accident.—A Mr. Smith, ironmonger, of Keighley, while engaged lately in filling a thirty-five gallon cask, which had contained petroleum, with olive oil, incautiously placed a lighted lamp upon it. An explosion immediately ensued, which blew out the plate-glass front and some of the windows on the opposite side of the street. Mr. Smith was slightly burned about the face and head.—*Grocer.*

The following journals have been received:—The 'British Medical Journal,' Feb. 11; the 'Medical Times and Gazette,' Feb. 11; the 'Lancet,' Feb. 11; the 'Medical Press and Circular,' Feb. 16; 'Nature,' Feb. 9; the 'Chemical News,' Feb. 10; 'Journal of the Society of Arts,' Feb. 9; 'Gardeners' Chronicle,' Feb. 11; the 'Grocer,' Feb. 11; the 'Chemist and Druggist' for February; the 'American Journal of Pharmacy' for February; the 'New York Druggists' Circular' for February; the 'Chicago Pharmacist' for January; the 'Canadian Pharmaceutical Journal' for January; the 'Journal of Materia Medica' for January.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[160.]—LIQUOR QUINIÆ AMMON.—Will any correspondent be kind enough to inform me how liquor quin. ammon. is prepared?—S. C.

[*** The following has already been published in this Journal, 1st ser. Vol. XIII. p. 344:—

℞. Quinæ Disulph. gr. xxxij
Spirit. Tenuior. ℥iiiss
Liquor. Ammoniæ ℥ss.

—ED. PHARM. JOURN.]

[161.]—TINCTURE OF MYRRH AND BORAX.—Can any of your readers tell me what is usually sold under this name? The formula given in Squire's 'Companion' seems to dissolve only a very small proportion of borax. I have tried equal parts of tinct. myrrh. and glycerin. boracis, which make a tolerably clear mixture, but I should be glad to know what others use.—PROVINCIAL.

[*** The following is the formula given by Piesse:—

Spirits of Wine . . .	1 quart.
Borax	1 oz.
Honey	1 oz.
Gum Myrrh	1 oz.
Red Sanders Wood . .	1 oz.

Rub the honey and borax well together in a mortar, then gradually add the spirit—which should not be stronger than ·920, *i. e.* proof spirit—the myrrh and sanders-wood, and macerate fourteen days.—ED. PHARM. JOURN.]

[162.]—ANILINE SULPHATE.—Will any reader oblige me with a formula for the manufacture of aniline sulphate?—J. T. SANDELL.

[163.]—ACIDUM CARBOLICUM AROMAT.—"*Country Druggist*" wishes to know what "acid. carbolic. aromat." is, used for inhaling.

[164.]—THE LOGWOOD BREAD TEST.—I have tested various samples of bread with the "methylated alcoholic infusion of logwood" test given in your Journal, amongst them one called aerated bread, which, on standing, turned of a bluish-green colour. Will any one be kind enough to explain what it is due to? The other samples showed their freedom from alum by turning of a yellowish-straw colour.—FILIUS NEMINIS, *Manchester.*

[165.]—PILL COVERING.—Will any reader kindly inform me the way to send out pills with a "tasteless white covering"?—S. R.

[166.]—BLACK INK.—*J. T. B.* and "*Scribe*" would be glad of a good recipe for black ink which would not corrode steel pens.

[167.]—LEMONADE.—*A. Z.* wishes for a good formula for making lemonade (aerated).

[168.]—FRAGRANT ESSENCE.—*G. H. B.* would be glad if any reader could give a good formula for the above.—GEO. HARVIE.

[169.]—CORN PLASTER.—*M. P. S.* wishes for a formula for Corn Plaster (not containing verdigris) to spread on linen.

[170.]—BALSAM OF LIQUORICE.—Will any reader kindly favour me with a recipe for the above?—Z. Z.

[171.]—BOTANICAL SPECIMENS.—Will any correspondent favour me with the best methods of drying and preserving botanical specimens?—HERBARIUS.

Correspondence.

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

Poison Regulations.

Sir,—My physical inability during the past three months to attend the meetings of the Council has not diminished my interest in the changing phases of the proposed regulations for keeping and dispensing poisons. The publication in the Pharmaceutical Journal of the 11th inst. of a "statement of reasons which have induced the Council to suggest regulations," bearing the endorsement of eleven members of Council, compels me in this way to record my dissent from those "reasons," a feeling which I cannot doubt is shared by many others of the ten remaining members of the Council.

On general grounds, the "reasons" appear to me as being framed upon a basis, suitable perhaps for the excuse of party measures, but inconsistent with the representative character of the Council. The historical notice of the Pharmacy Bill (No. 1) of 1865 may be satisfactory to those who are responsible for that expensive failure, but the allusion to the United Society of Chemists and Druggists as the cause of its failure is a very doubtful piece of good faith towards a body of men who were thought powerful enough to be parties to a treaty in 1868, and who maintained an unselfish fidelity not yet fully recognized, and certainly not rewarded.

The recommendations of the committee of the House of Commons in 1865 (instigated by the United Society) are taken as the origin of present restrictions on the sale of poisons, reserving the fact recorded by the "reasons" that 'prior to the passing of the Pharmacy Act of 1868 attempts had been made in Parliament at various times to enforce regulations for the sale of poisons." Surely this fact, used in the preceding paragraph as one of the "reasons" for present action, might fairly be supposed to have influenced the promoters of Bill No. 2 in 1865. The opponents of the regulations are perfectly aware of the tendency of modern legislation as relating to the liberty of the subject, it being clear that the tide has turned against that doctrine of *laissez faire*, which somewhat illogically received an impetus from the removal of fiscal burdens upon commerce and manufactures. We all know that such changes of policy tend towards an opposite extreme, and that unreasoning panic constantly follows a state of blind security. In connection with the present phase of advancing civilization, it is proper that the old ducal right, "a man may do as he likes with his own," should give way when that wish is exercised to the damage of his fellow-men. But society must apply its restrictions with some fairness, and show cause for the burdens which it imposes upon any class. The restrictions placed upon the sale of poisons was accepted by our body as a general measure which was not unreasonable But where is the evidence making a case for immediate and the most oppressive form of interference in the keeping of poisons? We all know that in years gone by it was no uncommon thing for tincture of rhubarb and tincture of opium to stand shoulder to shoulder, and that several mistakes happened as a consequence. The Pharmaceutical Society may point to its influence during a quarter of a century as having changed this state of things, and may assert that hardly any mistakes now occur which would be prevented by the proposed regulations.

In the 5th paragraph of the "reasons," it is stated that there was "a *tacit understanding* between the Council and the Government, that the Pharmaceutical Council should frame a code of regulations to be approved by the Privy Council." This is a point of the deepest importance, and I ask my fellow-members to observe it closely. "Tacit understanding" is something to be pondered over. "Secret treaty" is the modern phrase, and we now ask who had any power of making either "tacit understandings," or "secret treaties"? The authors of the "reasons" seem to have undertaken a task which will require them to show more "reasons." If the "understandings" of 1868 were something additional and beyond the Society's Bill, why were they not acknowledged? If "tacit," who were to be kept in the dark except the Society itself, which conferred the only representative powers possessed by its mouthpiece? A little study of the negotiations of 1868, by the dim light vouchsafed to us by those concerned, will show what probably happened. Mr. Simon, the medical officer of the Privy Council, constituted a new power in the State, and found a Bill to regulate pharmacy introduced into Parliament without its promoters having thought of obtaining his sanction. The reasonable character of that Bill, its respect for the recommendations of the Committee of the House of Commons of 1865, and its united support by all chemists, gave it a good prospect of viability. In the nature of things, Mr. Simon desired to impress upon the Bill those finishing touches which would show the hand of a master. Schedule A. was divided into two sections, and opium and its long train of preparations were added. The powers of confirmation previously vested by the Act of 1852 in one of her Majesty's Principal Secretaries of State, were transferred to the Privy Council, whilst clause 26 gave that body the power of removing from the Register any person who was convicted of an offence under the Act. The existence of clause 26 is by no means to be overlooked by those who are now asked to run a thousand new risks of conviction and its consequences. I doubt whether for cruel and irresponsible power, a more obnoxious clause can be found in the legislation of the past ten years. Whether Mr. Simon is likely to use such an arbitrary right is no part of the question whether it ought to exist, or of the much more practical one whether the danger should be widely extended.

During the various modifications of clause 1, as shown by copies of the Bill of different dates, its promoters finally accepted the requirement to "conform to such regulations as to the keeping, dispensing and selling of such poisons, as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council." Now, this clause, so far as referring to a power of revising Schedule A., "from time to time," was what any sensible man would have anticipated as requisite, whilst the distinctly permissive right to regulate "keeping and dispensing" also appeared to be a proof of not unwise forethought for the future. The pretence which has been made that "may" when in an Act of Parliament means "must," is sufficiently answered by the opinion of the Society's solicitor, distinctly denying the prospect of a threatened mandamus. Were it needful to bring any other argument on this point, we have only to compare the language of the Act when compulsion is directed, thus, clause 9, "The Council shall with all convenient speed, etc., make orders for regulating the Register."

Before leaving this notice of the birth of the Act of 1868, it is proper to reflect upon Mr. Sandford's position. The difficulties in the way of the Bill, consequent upon Mr. Simon's demands, must have caused him great anxiety, and increased those laborious exertions for which the Society has already expressed its gratitude. This was the second time that Mr. Sandford had taken charge of a Pharmacy Bill, and a risk of failure upon this occasion might well appear disheartening, whilst success was an object to satisfy the highest ambition of a pharmacist. Does not this supply the clue to the 'tacit understanding" now vaguely acknowledged. Does not this make it probable that Mr. Sandford has been personally entangled in his relations with Mr. Simon?

But, if answering these probabilities in the affirmative, what is the inference as concerns the Society? Simply that Mr. Sandford is not the free agent that the President of the Pharmaceutical Society ought to be. If the present proposals are the necessary result of any "tacit understanding" made in 1868, the Society will soon express its opinion as to those who were parties to such compact. Any time within the past thirty years, the trade would have been roused from one end of the kingdom to the other, rather than accept Government inspection, with a host of pitfalls such as Schedule A. would bring.

Amongst the "reasons," I find the "expression of opinion in the press" put forward by the Council. This is not the first time that this argument has been used; and, if I am correct, those who have put such an argument in the mouth of the Council, without the justification of facts, owe an explanation, which it will not be very easy to give. The *Lancet* has published two articles, and the *Pall Mall Gazette* one article, favouring the regulations. As these articles were immediately reproduced in the leader column of the Pharmaceutical Journal, and as no others have been seen there, we have only three to deal with. I have the best authority for asserting that these three articles were produced by gentlemen officially connected with the Pharmaceutical Society, and they were re-imported as an evidence of popular feeling!

Leaving the "reasons," after the foregoing explanation of my grounds for dissent, I will merely add a formal protest against the unusual conduct of a majority of the Council in delegating to a committee the revision and issue of such a document, which had not been seen until the Council met.

One view of the issue of the "reasons" is very satisfactory. A majority of the Council, after this lengthy explanation, will hardly repeat the not very flattering resolution lately passed, telling the constituency that it had not understood the question when it previously passed an opinion upon it; moreover, as the Council adopts the post as the proper means of communicating its ideas to its constituents, it may certainly be expected to recognize the same medium for receiving the verdict which it invites. The settlement of the question at the Annual Meeting by the voting-papers of all members, is of the first necessity to the welfare of the Society, and as the regulations would press with most unequal force upon different sections of the country, justice requires that all should have the same opportunity of recording their opinions.

I hold evidence that the promoters of the regulations are totally ignorant whether their adoption would be followed by Government inspection without a fresh Act of Parliament, or whether that would be necessary. They ask the Society to take the first and irrevocable step, and afterwards they will inquire about the second.

Richard Reynolds.

Southport, February 14th, 1871.

Sir,—While we search in vain through the statement recently placed before us for any but the old time-worn and threadbare arguments, one fact stands out with an alarming prominence, little intended by the authors of the paper,—the fact that we are at this moment, so far as the Society at large can be bound by the acts of its representatives, as ready to give way to pressure from above, as to resist it from below, under the irresponsible government of the medical officer to the Privy Council; and we may well inquire, in the light of its immediate change of policy in regard to "the dispensing of poisons," what value can be attached to the promise of the Council, that, in the event of the regulations being passed, "no vexatious proceedings will be adopted to inquire into their observance"? What guarantee have we against another change, equally sudden, should the autocratic Mr. Simon, by another letter, choose to bring the Council to a proper sense of its position? This very promise, indeed, puts the Council on the horns of a dilemma; either the regulations will not be enforced, in which case faith will not be kept with the Government; or if they are, then the Council must be seeking to throw dust in the eyes of its constituents, for no ingenuity can devise a means of enforcement which will not be vexatious!

Hampstead, February 13th, 1871. Charles Eve.

Sir,—Having already written twice upon the subject of poison regulations, I had not intended addressing you again; but am so much taken by surprise at the report of last Council meeting, and the circular resulting from it, that I could not feel justified in allowing the matter to pass over unnoticed.

Is it not remarkable that at the December meeting of Council, when Messrs. Woolley and Brown proposed that the opinion of the members of the trade relative to this question should be asked by circular, a majority of the Council then present objected to the chemists generally being communicated with; and that we now have a circular drawn up by a committee consisting of the very men who opposed this proceeding in December last?

Is it forgotten that Messrs. Woolley and Brown were elected by a larger number of votes than any other members of Council, and that these votes came principally from provincial members—members who felt they ought to be better represented on the Council than had previously been the case—who felt also that their representatives had only asked a bare measure of justice in moving that the chemists throughout the country should be asked to say whether or not they thought these poison regulations desirable? I said it was a measure of bare justice, and I reiterate the statement, because the regulations, if adopted, would affect the arrangements of some thousands of chemists, outside our Society, who, but for this proceeding, would have no opportunity of influencing the legislation under which they would be governed.

Did the Council deem it a duty to represent the interests of our Society only, without regard to the outsiders? Had it been so, Mr. Woolley's query might at least have been sent to the provincial members of the Society, who, though not debarred by bye-laws, are prevented by other circumstances from attending the annual meeting. Or was it thought, notwithstanding all the correspondence which has taken place upon this question, that the country members had given no consideration to, nor felt any interest in it? No! I can come to but one conclusion, that the Council knew and remembered all the circumstances of the case, and, knowing them, did not dare to ask the simple question as put by Mr. Woolley, because they knew that the replies would cut away the ground upon which they intended to carry out their foregone conclusion. And now we receive a circular from them, not asking if further regulations are desirable, and, if so, to what extent that may be the case, or of what nature such regulations should be, but telling us what regulations are to be proposed: making an elaborate statement, calculated—probably intended—to stop further opposition by intimidation, and apparently bribing us into submission to the proposed regulations by the statement that "they venture to say," though they do not give us any reason to believe, "that no vexatious proceedings will be adopted to inquire into their observance."

I believe every man of common sense would rather a law were not made, than that it should be made not to be enforced; and now that we have received from the Council the code of regulations which it proposes to submit to the meeting in May, and the reasons why it is thought we should adopt them, I think we cannot do better than give the reasons why we think such regulations should not be adopted.

Personally, I have given much attention to the matter, and have come to the following conclusions:—

1. That it is not desirable to make any regulations which are not very simple and easily adopted, perfectly definite and free from all ambiguity, practically useful as a protection to dispenser and patient.

It is imperative that any regulations to be adopted must be *simple*, because, if not so, they will not be practically carried out. They must be *definite*, that the chemist may know precisely what is expected of him. They must be *free from ambiguity*, that, in the event of an accident happening, a coroner's jury may have no difficulty in deciding whether or not the regulations have been complied with. They must be *practically useful*, that they may not be submitted to as a hardship, but practised willingly for the sake of the advantage to be derived from them.

2. That if any distinctive mark is adopted to indicate a poison, that mark ought to be definite, and it should not be left to the option of each individual to select his own mark or marks; otherwise there will constantly be room to dispute whether or not a bottle bears a distinctive mark.

3. That it is not desirable to use for the less dangerous poisons (such as tinct. opii ammon., empl. belladonnæ or ung. sabinæ) any danger-signal or label which is intended to act as a caution in the use of the more dangerous poisons (such as morphia, strychnia or hydrocyanic acid).

Turning now to the details of the proposed code, the first regulation is objectionable.

A. Because if a distinctive mark be adopted, it is to apply to all poisons, whether very dangerous or comparatively free from danger.

B. Because, if a number of distinctive marks may be adopted, it is not free from ambiguity upon that point.

C. And because it does not define a distinctive mark or marks which should be used.

It is not desirable to have alternative regulations, because their adoption increases the chance of the danger-signal being entirely overlooked, while increasing the chance of censure from a coroner's jury or the public press, if they see that *some* precautions have not been taken, which, according to the code of regulations *might*, and they will say *ought*, to have been adopted.

And there are many articles in the poison schedule, to the keeping of which it is not desirable that any of the three alternative regulations should be required to apply, such as syrup of poppies, sundry ointments, plasters, etc.

There is only a fraction of one of the regulations which it would be desirable to put in force with regard to all the poisons in the schedule, and that is "that each poison shall be labelled with its name." And no schedule can be a satisfactory basis for regulations which does not enumerate every poison distinctly to which the regulations are to apply. The loose way in which are included "all poisonous vegetable alkaloids," "all metallic cyanides," and "preparations of X

Y. or Z." is sufficient to make the schedule a subject of frequent contention.

It would be much more to the purpose if the same trouble were taken to devise regulations for the sale of vermin-killers, with which accidents frequently occur, instead of regulating the keeping and dispensing of medicines, which have not been a fruitful source of danger. I cannot call to mind a single death within ten years resulting from a mistake on the part of a pharmacist in Newcastle, but we have had two deaths from vermin-killers within the last ten days.

It is almost unnecessary to inquire of what use can it be to put lotions in "danger bottles" when prepared in a pharmacy, and allowing them to be put in "safe bottles" when prepared in a surgery? For a danger bottle to be any use, its use should be general. So long as three-fourths of the dispensing is done in surgeries and public dispensaries, where poison regultions are not respected, it is futile to expect that poison bottles used in the other fourth will gain public respect as a caution.

No one need suppose that the Privy Council or the Legislature would wish to enforce any regulations which were not calculated to be of practical advantage to the public. Nor can it be supposed that they wish to see nominally adopted a code of regulations which are not to be enforced. Our policy, therefore, should be to inform them that our experience has shown us the undesirability of attempting to lay down strict rules.

I trust that at the Annual Meeting the Society will express its conviction that it is not desirable to add any regulations for the keeping, dispensng or selling of poisons, till experience has shown that those already contained in the Act do not afford as much protection against errors on the part of pharmaceutists as the public have a right to expect.

Grey Street, Newcastle. BARNARD S. PROCTOR.

Sir,—I am sorry to see so many unnecessary and really frivolous objections to the proposed regulations for the storing and keeping of poisons, etc. That compulsion is repugnant to the feelings of Englishmen—the scientific especially—I am willing to allow; yet I hardly take this matter in a compulsory light, as the plan emanating from the Council, originates with ourselves.

It is quite clear we are expected to adopt something of the kind, therefore is it not far better to frame our own, rather than have to submit *nolentes volentes* to regulations proposed by those who are entirely ignorant of the working details of our business? The regulations suggested by our Council are comprehensive and practicable, and from the choice they offer, are such as I think no "reasonable" man can object to. I would, however, propose, that instead of using a label, "Not to be taken internally," we should prefer, "For outward use only," because if the word "not" became obliterated or torn off, the effect would be exactly reversed; the word 'poison' could be added if desirable.

I think as a rule we are not sufficiently discreet in the arrangement of our stocks, and although it may seem absurd to be "over-careful," yet it is a pardonable weakness, if such it may be called. Whether the medical profession are required or not to use the same precautions, matters little to us; we have quite enough to do without interfering with them. In my opinion, if we were to act more charitably towards them than we do, there would not be half the rancour existing between us that there now is. I have never found any difficulty in the matter; always striving to do my best to oblige them, I am bound to say, those I know are not behind in endeavouring to assist me. If we are continually trying to find out points that are seemingly objectionable to us, and bandying them about, is it likely, I ask, they will look upon us other than as enemies? whereas we should try and cement more closely the two professions that are so nearly related to each other. Again, we have plenty of topics to discuss, such as education, provincial classes and lectures, provincial unity, earlier closing and less Sunday work,—these affect us far more closely than arguments about surgeons and doctors. Meanwhile, let us calmly consider the "poison regulations," so that after the annual meeting the world may be favoured with a report of business-like and amicable re-union, instead of, as last year, an assemblage of chemists which reminded one very forcibly of a zoological exhibition.

In conclusion, let us bear in mind that the Council is composed of gentlemen representing almost every kind of our business,—that they have studied well to regard our various interests, and that they are requested by the Privy Council to move in this matter; therefore instead of putting difficulties in their way, let us rather assist them cheerfully by accepting what they have taken such pains to offer, and thus show our gratitude and confidence in them.

ALFRED W. SMITH.

93 *and* 94, *High Street, Rye, Sussex.*

Sir,—In digesting many of the plans suggested on the above subject, the most urgent, in my estimation, has been overlooked, viz. the great importance of assistants faithfully carrying out such regulations.

In every case where I have been enabled to get at the truth, the accident has arisen from neglect of this simple duty; it was palpably so in the instance referred to by Mr. Oldham in your last impression. Had the excellent regulations of that well-known establishment been carried out by the assistant, I can affirm from personal knowledge that an accident would have been impossible.

If we are to be under a penalty for non-performance of "proposed regulations," should not the same be equally binding on assistants?

Happily, the careless are not numerous among us. I have pleasure in knowing many who use every care, and do their best to carry out established rules, but not one of us is exempt from coming across a careless one now and again. It is to these my remarks apply.

In regard to the "particular bottle" to be used in dispensing liniments, etc., what is to prevent its being afterwards used for tincture of rhubarb, or more frequently for gin, etc.? In this case it might cause that which we wish to avoid,—forgetting that a second particular bottle containing some deadly poison was placed in the same cupboard,—the contents of one are administered for the other, the fatal mistake is made, and the fond mother, weeping over her lifeless child, tells you she did not read the label because she knew it was in that "particular-shaped bottle." The careful need no caution. In giving a distinctive bottle, you offer an inducement for the careless to become more so.

How often do we hear of "Burnett's fluid" being mistaken for something else? It is in a "particular bottle." Shall we be liable to a penalty for using the "particular bottle" for any other than its legitimate use? If so, pray include publicans, oilmen, and all who may make use of it otherwise.

The label is desirable, and is in daily use in all respectable dispensing establishments without compulsion.

Nothing is poison if administered in proper doses. What A calls poison B does not. It is very essential that we be informed what is considered poison by the Council.

London. THOS. J. W. TIPPING.

Sir,—May I also beg a small space for a few words on the subject of "compulsory legislation for the storing of poisons?" I should like to ask a question or two.

Will it protect the public?

Experience so far does not prove the assumption. Did space allow, I could quote cases where the most stringent regulations utterly collapsed.

Is our experience of what legislation has done for us so agreeable and beneficial that we are anxious to have more of the same sort?

If the proposed regulations pass the annual meeting (in the enforced absence of most country members, who, it seems, will therefore not be allowed to vote), how are they to be compulsory?

Is the present Act compulsory?

I suppose it is considered so. Yet I know a pharmacist who told me he had never yet kept a "poison book," nor did he intend to do so. Of course he is liable to action for damages in case of accident; but so, I suppose, we shall all be even if we comply with the most elaborate code of regulations that can be devised. After fulfilling the letter of the law in that respect, we shall be still subject to all its pains and penalties (that is, in the case of any dispenser or seller of poisons who is thought able to pay).

If it were proposed to draw up a series of regulations, and then acquit a dispenser or retailer of blame because he had fulfilled them, very little opposition would be offered by any who had to submit to them.

Seventeen years' experience in my own case goes to prove that where responsibility is felt by each individual, and no faith placed in either loose caps, stopper guards, or other mechanical safeguards, there are less mistakes (and no fatalities) than in other places where stringent and burdensome regulations are imposed upon the assistants.

I would then say to the Council, advise by all means, but compel by no means. Recollect that you now represent the whole trade (not our Society only), and you are in duty bound to show the Privy Council how unsatisfactory such piecemeal and tinkering legislation as has been indulged in on the subject of "poisons" is and must be, if not to all, at least to a large majority.

Liverpool. ALFRED UTLEY.

Sir,—With regard to the third regulation proposed by the Council, that "all poisons be sent out in bottles, readily distinguishable by touch from ordinary medicine bottles," I think a clause should be inserted making it illegal to sell in poison-bottles anything which has to be taken internally.

Poison bottles are of no use if one sells medicines in them, and the public will bring such bottles for syr. rhei, spt. æth. nitr., etc.

I respectfully suggest the above for the consideration of the Council.

Sheffield. EDWARD BARBER.

Sir,—Respecting the "keeping and dispensing of poisons," I think the chemists, as a body of men, ought not to interfere with the proceedings of the Pharmaceutical Society; but rather support its efforts in trying to promote our interest. The simple regulations set forth by the Council cannot in any way inconvenience us, as such regulations already exist or ought to exist in our establishments; and as for thinking them compulsory, why we had better be compelled (if such is the case) by our own Council, which does so for our best, than by the Medical Council or by others, who would only be too glad to interfere, if but an opportunity be allowed. There is one thing which I hope will be the issue of this subject, viz. that the regulations will apply to the medical men who keep open shop as well as to the chemists, and then I do not see how we can have any objection to them. I made use of the words "own Council," because I feel that the interest and promotion of the profession rests with the Society, with which our children and grandchildren will ultimately have to do in some shape or other, if they mean to follow the profession, therefore we ought to do our best to uphold and support the Society. I have, at present, nothing whatever to do with the Society, but I shall certainly take the first opportunity to send my name in for election, and I would urge upon us all to do the same, that we may all be under the same standard.

730, *Old Kent Road, S.E.* J. S. S.

Sir,—I have read the statement which the Secretary of the Pharmaceutical Society has issued by order of the Council, and have given it my most serious attention; but I am bound to say that I cannot see any sufficient reason why the Council should still persist in proposing regulations regarding the keeping, dispensing and selling of poisons.

With reference to the keeping and dispensing of powerful remedies,—for I prefer this designation,—the chemists' own material interest, saying nothing of those moral considerations which I believe to be the primary object of a vast majority of our members, gives more security than any which legislation can provide.

Then, with regard to the sale of poisons. This question I consider has been most satisfactorily settled by law. The Arsenic Act was very important and proper, having quite a different bearing to the keeping and dispensing of powerful remedies. The public had a right to such restriction, as a means of thwarting criminal intention, and of checking evil-disposed persons in their path, through fear of leaving footprints behind.

After forty years' responsible practice, with its experience, I come to the conclusion that to present to our customers' eyes emblems of death is unwise, but that they should rather be taught that many of our medicines are powerful and important agents in the cure and alleviation of human diseases, requiring the most careful attention, for which we cannot, reasonably speaking, be paid too much.

I have been connected with the Society from its foundation, and feel proud of the position it has attained, and I fervently hope the Council, seeing the pain these poison regulations are occasioning a vast majority of its members, will retrace its steps, and report at the next general meeting "that it is of opinion it is unnecessary to propose any regulations for the storing, keeping and dispensing of poisons, believing that the rapid advancement pharmacy is making in this country will be the best public security."

Kilburn, February 13th, 1871. JOHN BEATON.

Sir,—The explanations which the Council of the Pharmaceutical Society have given of the proposed regulations for the keeping and dispensing of poisons, will do much to make them acceptable to the chemists generally. I, for one, must acknowledge my dulness of intellect in thinking that by adopting any one of the proposed systems, it would apply to all poisons, and not as is now explained by the Council, that some of the poisons could be kept in a closet set apart for dangerous articles, and another portion of them on the shelves amongst the other bottles, provided the bottles or vessels containing poisons are either capped or tied over or rendered readily distinguishable to the touch. The delay of twelve months has not been wasted, but during that time the proposed regulations have been so much improved that they can now be carried out in any shop with very little trouble or expense, and need not interfere with the present arrangement of the bottles. The regulation relating to the dispensing of poisons is very simple. There will be no necessity to have specially-made bottles to send out liniments, lotions and embrocations in. Any bottle will meet the requirements of the regulations, if a piece of glass or sand-paper or other roughened material is pasted on the side or back of the bottle. But to make this clause thoroughly effectual, I think another is rendered necessary, prohibiting the sending out of medicines intended for internal use in the distinctive bottles used for internal remedies. Without some such regulation the distinctive bottle will be used for some internal remedy, and, probably, one day we shall find that the regulation has caused to be done the very thing it was intended to prevent, by the liniment being taken instead of the simple remedy from a family recipe. As I expressed in my letter (which was allowed to appear in the number of the Journal for March last) an opinion that the corrugated bottle was best adapted for general use, I will again point out its easy application to all classes of trade. If an ordinary medicine bottle was taken to a chemist to have a liniment put into it, all that would have to be done would be to stick a piece of roughened paper on its side or back, and it would be converted into a distinctive bottle; then, if a bottle so converted was taken for medicine for internal use, it would only be necessary to scrape off the roughened surface, and it again becomes an ordinary medicine bottle. Many chemists object to being trammelled with regulations whilst the surgeon is free to keep and dispense his poisons as he likes. I believe there is even greater need for the regulations to be applied to the surgery than the shop. But I trust this necessity will soon disappear by the surgeon handing over the dispensing to the chemist. Anyhow, the public will learn that there is greater safety in getting their medicine dispensed where every precaution is taken to prevent accidents than where no system whatever is adopted, and where even most deadly poisons may occasionally be found in bottles without labels of any kind on them.

Rochdale, February 14th, 1871. RALPH ROBINSON.

Sir,—In reading the various letters which have appeared in your Journal on the proposed poison regulations, I have regretted that most of them were not so conciliatory as they might have been, as it is very evident that the Council have simply a sincere desire to promote the general welfare of the trade, and are ready to take into their consideration every reasonable objection which may be pointed out to them. I am opposed to regulations for the storing of poisons, not, however, as it affects dispensing chemists, but on account of the difficulty which some must experience in those parts where they deal largely in poisonous drugs and chemicals for manufacturing, etc., purposes. I have no doubt, however, that the Council will try to meet this difficulty to the best of their ability. If, as Mr. Jones states in his letter, "we never allow preparations to pass through our hands without proper recognition, poisoning would become a thing of the past, and we should then have accomplished what the storing of poisons can never attain."

In conclusion, I would briefly state that what seems the most unpleasant part in this matter of legislation is, that public dispensaries and surgeries, etc. should be exempt from it. I hope in the meantime that the subject will be thoroughly ventilated before the Annual Meeting.

Manchester, February 14th, 1871. E. WALSH.

Sir,—I had hoped, probably with the generality of your readers, that the proposed regulations for the keeping of poisons would have been accepted as sufficient by the Privy Council. Our hope, however, has proved fallacious. The Society is asked to frame regulations also for the dispensing of poisons.

I would, with all due deference, ask the Council of the Pharmaceutical Society as to whether they have not unnecessarily yielded to pressure from her Majesty's Privy Council? To honour the powers that be is perfectly right; but have they ever sought a conference with that body, so that the subject might for once be seen by them from other standpoints than from those of physicians, surgeons and the presumably alarmed and endangered public? In short, have endeavours been made to get the Medical Department to look at the question from the chemist's point of view? I am aware that the President and the Secretary of the Society had an interview with Mr. Simon about three weeks ago, but it was at that gentleman's own request, and respected verbal alterations,—not (apparently) a review of the entire subject. (Pharm. Journ. p. 652–3.)

The proposed regulations for the dispensing of poisons are certainly not very onerous, but the clause "that there shall be affixed to each such bottle (of poisonous lotion, etc.) a label giving notice that the contents of the bottle are not to be taken internally," is not altogether free from objection.

Cases often occur in which, from the absence of directions, the dispenser is at a loss to determine whether the lotion, so-called, is really such, an injection or a mouth-wash. Under such circumstances, the label "for external use only" is evidently inappropriate; "not to be taken internally," would lead many patients to question whether the compound was for internal use at all; while the uneuphonious "not to be drunk," or "not to be swallowed," might induce the opposite error, and cause a lotion to be employed as a gargle. The somewhat vague direction "not to be taken" is the only one universally applicable.

Oxford, February 15th, 1871. John Throssell.

Sir,—Having received the statement of the Council respecting the poison regulations, we think, before we can come to a right decision on the subject, the Council should state—

1st. The name of every drug, chemical, or preparation that they propose to call a poison, and which would be affected by the regulations.

2nd. The machinery by which they propose to enforce them. Vines and Froom.

Sir,—In common with the rest of the trade, I have received from Mr. Bremridge "A statement of the reasons which have induced the Council to suggest regulations regarding the keeping, dispensing and selling of poisons," and I find one sentence which, for unpleasant vagueness, might well compare with the guarantee given by Messrs. Dodson and Fogg (on receiving Mrs. Bardell's undertaking for the costs in *Bardell* v. *Pickwick*) that it was "only a matter of form." The sentence, or rather part of a sentence, to which I allude is this:—"But, with reference to the obligations which the regulations would impose, they venture to say that no vexatious proceedings will be adopted to inquire into their observance."

Now, with all due respect to the Council, can anything be more ambiguous or unsatisfactory than this?

I think few men would be foolish enough in any business negotiation to take such an assertion as a guarantee. Would any one, on giving an acknowledgment for money due, believe his creditor if he told him that "no vexatious proceedings" should result if he did not meet his engagement? To me the two cases appear similar.

If it is necessary for the public safety, etc., that these regulations should become law, is it not also necessary that when law they should be conformed to?

If we assent to the passing of such an Act, we ought to do so with our eyes open to the unpleasant consequences in the way of supervision which might, and in all probability would, result from such a measure, and not allow the bait to be sugared with specious promises which the Council itself, if it had the wish, would not have the power to keep.

Edwin A. Lewis.

3, Mornington Street, Mornington Crescent, N.W., February 15th, 1871.

Sir,—Whilst I must submit to the multitude of not-overwise Councillors, Privy and Pharmaceutical, I cannot but protest against their meddling, irritating restrictions upon chemists, a class of men careful beyond cavil, whilst "Knockemorf" is licensed to kill without let or hindrance. Why are not surgeries to have "poison" bottles and three-cornered dispensing ones? Perhaps our Council will tell me into what shaped glass I am to dispense the following recipe, received to-day:—

R. Tr. Opii ʒj
Zinci Sulph. gr. x
Glycerini ℥ss
Aq. Camph. ad ℥vj. M.

It may be an injection, skin- or head-lotion, or cough mixture. Being sedative and expectorant, am I to be made the scapegoat of an antagonistic surgeon or the tool of any prescribing informer? The word "poison" is become as nought, the public sees and hears so much of it; and so does

Wetherby, February 14th, 1871. Jas. Houlton.

Wholesale Druggists' Assistants' Association.

Sir,—The remarks of Mr. Davies Owen in your Journal of the 14th inst., are so severe upon wholesale assistants that it makes it necessary to place the matter in its right light. The picture of retail assistants advancing and wholesale ones gradually sinking in the social scale, judging from the steps taken by employers to prevent dishonesty, would be a sad one were it correct; but the mere fact of employers combining to form a trade protection society, to prevent robberies and prosecute thieves and receivers of stolen goods, is no imputation upon assistants, as it is well known that porters and others of a similar grade are the parties most liable to the operations of the Society.

The next statement of Mr. Owen's, that the retail trade pass a regular apprenticeship, reside with their employers and have access to various works and journals, while the bulk of the wholesale men have not these opportunities, is also incorrect, inasmuch as they serve a similar apprenticeship (and some of them a more practical one than the present generation have served), and many of them have been assistants a few years in the retail, who have taken situations in the wholesale to perfect themselves in their business.

Another idea, that members of the proposed society should discuss matters of trade interest, would simply amount to wholesale houses having their trade secrets made common property. I think that the kind of society proposed by Mr. Owen is not felt to be a want, or it would have been supported before. Justitia.

London, January 16th, 1870.

J. T. (Lewisham).—The law is vague in regard to the question, but probably it may be regarded as not prohibitory of such prescribing, though in the event of any mischance, the punishment would be more severe than in the case of a duly qualified medical man. As a point of ethics, however, there can be no doubt that counter-prescribing by druggists should at least be restricted within the narrowest limits possible.

"*Tolu.*"—We do not consider the negative result satisfactory evidence, neither are we able to answer the question put.

H. J. Woolley (Islington).—The formula has been given recently. See p. 377 of the present volume, and the correspondence concerning it on pp. 397 and 419.

"*Veritas.*"—The mention of emp. hydrarg. is evidently an error, and, as you suggest, emp. opii should be in its place.

"*A Student*" (Sheffield).—There is no danger.

F. L. Cove.—Probably Piesse's 'Art of Perfumery.'

Messrs. Sawyer and Bird.—The advertisement has been handed to the publisher.

C. J. Bell.—Your letter has been given to the Secretary.

A. P. S., *Amicus* and *A Member* have omitted to forward their names.

We have received a letter from Messrs. Domeier and Co., stating that they only execute for De Haen and Co., or the other houses they represent, such orders as are given by manufacturing chemists and wholesale druggists.

Communications, Letters, etc., have been received from Mr. A. W. Bennett, Mr. T. J. W. Tipping, Mr. J. S. Parker, Mr. W. Hills, Mr. G. Harvie, Mr. J. Ash, Mr. Padwick, Mr. Siebold, Mr. E. Walsh, Mr. Smith, Mr. Gray, Mr. P. L. Simmonds, Mr. C. H. Wood, S. R., "A Country Druggist," "Spes," A. P. S.

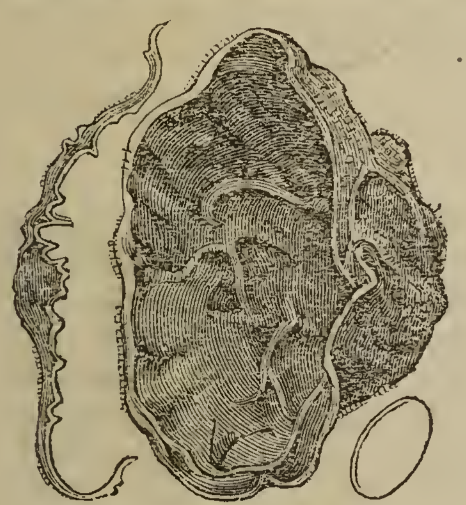
JEW'S EAR.

(*Hirneola Auricula-Judæ.*)

BY M. C. COOKE, M.A.

Notwithstanding Mr. Simmonds's interesting book on that subject, there are still some chapters in the history of the "Curiosities of Food" unwritten, especially those relating to vegetable diet. So peculiar are the tastes of the Chinese, that we are ready to believe it possible for them to relish anything whatever, provided it can be manipulated in any way so as to be capable of mastication. All kinds of gelatinous substances, whether birds' nests, sea slugs, shark fins, seaweeds, and even gelatinous fungi are pressed into the service of the Chinese gastronomist. To the latter belongs the subject of the present notice.

Old Elder stumps in this country are frequently inhabited by a singularly flabby-looking fungus, to which the name of "Jew's-ear" has been given, on account of its fancied resemblance to a human ear. Our figure represents a small specimen, with a section beside it, and one of the elliptical spores.



Hirneola Auricula-Judæ.

This fungus belongs to the *Tremellini*, an order of fungi that are characteristically gelatinous. The scientific name is recorded above. There is but one British species of the genus, and that is widely distributed; it is found again in the United States, and amongst the islands of the South Seas. The fungus itself is thin, concave, flexuous and blackish, folded and veined everywhere, with the under surface velvety, and of a cinereous-olive. When dry it has a horny texture, and shrinks very much, but it will swell out again nearly to its natural size and form if immersed in water, even after the lapse of many years. The size varies from one to three inches in diameter, and sometimes two or three individuals are confluent.

It seems never to have entered into the heads of Englishmen, not even professed mycophagists, that this leathery-looking "Jew's-ear" could be converted into food. There was exhibited in the Indian Department of the Exhibition of 1862 a bottle of dried fungi, sent from China, by way of Singapore, which consisted wholly of this species, identified by us at the time, and as such inserted in the catalogue. By reference also to the catalogue of the French Colonies for the same Exhibition (at p. 109), we find enumerated from Tahiti "Champignons dits oreilles de rats, *Exidia Auricula-Judæ*—Taria eriore." In a note it is stated that this fungus is very common at Tahiti and the neighbouring islands, and is in great esteem in China, to which country it is largely exported. In the fifth volume of Seemann's 'Journal of Botany' (p. 263), is a paragraph stating that Mr. Brander, a well-known merchant, residing at Tahiti, had furnished the following information about an edible fungus, of which quantities were often sent to Sydney; he says, "What is called 'fungus' in our export list, is an article of commerce found in the islands of the South Pacific, principally the Society and Leeward Islands, on decayed trees. The Tahitians call it 'Teria iore' (*i. e.* rat's ear), from a certain resemblance of the shape of the plant to the ear of a rat. The fungus first began to be collected in 1863, and fetches in China, where it is much esteemed and made into soups, from eighteen to twenty cents per pound." In a subsequent number of the same journal (vi. p. 339), this fungus was referred without doubt to the present species.

This was almost all that could be collected of information about the Jew's-ear, until very recently, when we heard of it again in a rather unexpected quarter. From the Reports of the United States Department of Agriculture, we gather that "the *Bulletin* (California) announces the arrival at San Francisco of a brig from Tahiti, with about thirty thousand pounds of fungus gathered on the trees in the southern part of the Society Islands, and packed in bags woven from slips of Booroa bark, the same wood from which the orange crates are made. This fungus is in appearance like very thin and dirty india-rubber, and is to be shipped to China for use in making 'soup' in the Celestial kingdom. The value is about twelve and a half cents per pound at the islands, and about one hundred thousand pounds are produced there annually."*

It is very clear that all these statements refer to the same thing, the *Hirneola Auricula-Judæ*† of Fries, which we allow to ripen, and rot upon Elder stumps and Elms, but which is an article of commerce in the South Seas, and is collected there after the rate of 100,000 lb. a year. The only market for this strange product seems to be China, and the sample sent from thence to the Exhibition of 1862 was in all probability, not indigenous, but derived, in the way of trade, from Tahiti. The observation that it was not collected there till 1863, as mentioned by Mr. Brander, might be an error of date for 1861, or, it might not have been collected as a regular article of commerce until 1863. At any rate, it was most certainly exhibited in London in 1862, from China and Tahiti, as will be seen by reference to the Catalogues of India, and the French Colonies.

At one time this fungus had a reputation for the cure of sore throats, and also as a topical astringent. Its faculty of absorbing and holding water like a sponge has resulted in its use as a medium for applying eyewater to weak or diseased eyes, and similar purposes. Of late years it is seldom, perhaps never, to be met with in the herbalists' shops, and, in England at least, its reputation and "occupation's gone." Old Gerarde writes thus of it, "the fungous excrescence of the Elder, commonly called a Jewes eare, is much used against the inflammations and all other sorenesses of the throat, being boyled in milke, steeped in beere, vinegar, or any other convenient liquor." A rude figure is given under the name of Auricula Judæ, which name is applied to it also by Lobel, but the fungus is not figured by him.

* Monthly Report of the Department of Agriculture of the United States, January 1869, p. 28.

† Cooke's 'Handbook of British Fungi,' p. 349, fig. 97.

CASTOR-OIL SOAP.

BY F. M. RIMMINGTON.

It is somewhat remarkable that our present English pharmacy has no pure medicinal soap possessing any characteristic property or medicinal activity. The ordinary Castile soap, being that which is commonly used for that ordered by the Pharmacopœia, can scarcely be considered a satisfactory article when we consider its composition and the mode of its manufacture. Having recently had occasion to direct my attention to this subject, it occurred to me that castor-oil offered some advantages, and would yield a soap possessing qualities very desirable in an article which so frequently formed the medium or adjunct for administering other active remedies. On putting this idea into practice, I found that a soap prepared from this oil has rather marked qualities, but my opportunities do not afford me the means of properly testing its medicinal properties. I believe it will be found that it has sufficient aperient power to relax the bowels when taken consecutively for several days, but I believe its greatest value will be found as an adjunct to other aperients. This at least is the result I have arrived at. It is, of course, well known that the purgative principle of castor oil has been ascribed by Soubeiran to the existence of a supposed oleo-resin, and that the ricinoleic acid is extremely acrid. I find when the oil is saponified that this acrid principle is either entirely or partially liberated, and does not continue masked as it is in the oil in its natural state, nor neutralized, as might be expected, by the alkali. It is to this fact, I think, we must look for any active property this soap may possess; and here I must leave the matter for the further investigation of the medical and pharmaceutical professions. The physical properties of the soap are in its favour for use in medicine. It has a clean yellowish-white colour, is free from smell; it soon becomes dry, hard and is easily powdered; it has no tendency to soften or deliquesce on exposure to the air. In proof spirit it makes a perfectly clear and colourless solution, with only little sediment. I shall forward a specimen to the Society for the inspection of those who may feel interested.

MAGNIFICENT FLUORESCENCE OF PEPPERMINT OIL.

BY PROFESSOR FLÜCKIGER.

50 to 70 drops of peppermint oil shaken with one drop of nitric acid, about 1·2 sp. gr., turn faintly yellowish, brownish, and, after an hour or two, exhibit a most beautiful blue-violet, or greenish-blue colour, when examined in transparent light. When observed in reflected light, the liquid is of a copper colour, and not transparent. If the mixture is warmed, the green or blue coloration takes place speedily; it may also be immediately provoked by adding a greater amount of nitric acid, say 1 drop to 10, or 9 drops of the essential oil.

Bisulphide of carbon contributes in no way to improve the test. All the various specimens of peppermint oil at my command show the same behaviour, but the blue or greenish-blue hue exhibits very appreciable differences, which ought to be further examined by chemists possessing authentic specimens of the oil under notice. A very old specimen of an originally excellent English oil, however, was no longer coloured.

The colour which peppermint oil thus acquires is remarkable on account of its persistency, for it lasts a week or two, at least in cold. Yet, unfortunately, it appears not capable of being applied as a true test; an admixture of 5 per cent. of oil of turpentine, for instance, does not at all prevent peppermint oil from assuming the blue or green colour; on the other hand, I have not as yet met with any other oil partaking of the same behaviour; carven, the the more volatile portion of caraway-oil, also acquires a slight similar fluorescence, but by no means comparable to the above-described as regards purity and intensity of colour.

Peppermint oil, which has become coloured in this way, is quickly decolorized if shaken with carbonate of calcium; granulated zinc likewise causes it slowly to turn brownish. Spectroscopic examination of the coloured oil furnishes no phenomena of particular interest. Chromic acid, dissolved in chloroform, does not perform the same reaction as nitric acid.

Berne, January 1871.

CYTISIN.

An article, by Dr. William Marmé, "On the Action and Production of Cytisin," appears in a recent number of the 'Transactions of the Academy of Göttingen.' Cytisin was first separated by the writer, in conjunction with Professor Aug. Husemann, from the unripe pods and ripe seeds of *Cytisus Laburnum*, Linn., as a strongly alkaline vegetable-base, easily crystallizable, and forming single and double salts, readily soluble in water and alcohol, but not in ether. The following observations supplement those already published in the 'Zeitschrift für Chemie,' 8th Jahrg. p. 161, and Husemann's 'Neues Jahrbuch für Pharmacie,' xxxi. pp. 1–21.

1. *Action of Cytisin upon Animals.*—The poisonous action of cytisin, the pure alkali as well as the very easily crystallizable nitric salt, extends to animals of every type. This was established by experiments on animals belonging to the various classes of Protozoa, Cœlenterata, Echinodermata, Vermes, Crustacea, Arachnoidea, Myriapoda, Insecta, Mollusca, Pisces, Amphibia, Reptilia, Aves, and Mammalia. The poisonous action takes effect by application to all parts of the system, except the outer skin. A very small dose is fatal to all the higher animals. For frogs a dose of ·002–·004 gramme was sufficient; for young pigeons ·003 gr.; for owls ·001 gr.; for jays ·0015 gr.; for cats ·03–·05 gr.; for dogs ·06–·1 gr.; for rabbits ·05–·08 gr., and for kids ·3–·4 gr., by subcutaneous application; or by injection, for cats ·015 gr.; for dogs ·025–·05 gr., and for rabbits ·01–·015 gr. of cytisin nitrate. Usually the poison acts in the first place by exciting, the excitation soon passing away, and giving place to a depression or complete paralysis, with a rapidity in proportion to the amount of the dose. The function of the cerebrum is not directly affected; no narcotic action, properly speaking, is exhibited with the lower animals. The spinal cord and the motor nerves are at first excited, a more or less complete paralysis following, which commences in the peripheric ends of the motor nerves. The voluntary muscles may be completely excited

by an induction-current after entire paralysis of their motor nerves, and even when direct mechanical and chemical irritation produces no contraction. The sensible nerves are injured in their action only very late by cytisin. A change in the respiration is, with all the higher animals, one of the first symptoms of poisoning by cytisin. It is at first accelerated, then becomes retarded, and is finally completely suspended by paralysis of the nerves. The vaso-motor system of nerves is excited by cytisin. The ganglionic central-organ, which lies in the heart and occasions its contraction, is at first excited, and then becomes weaker and possibly paralysed. With dogs, cats, and rabbits, and generally also with birds, salivation arises during the poisoning. With birds, and many mammalia, cytisin occasions vomiting by all modes of application. It excites, both after introduction into the stomach and intestines, as well as after subcutaneous application, increased, often powerful, peristaltic action. In no mode of application does cytisin exercise any constant action on the pupil. The temperature of the body is only slightly increased, quite at the commencement of the poisoning, but sinks steadily till death. The elimination of the cytisin introduced into the body takes place especially through the nerves, unless by vomiting. Recovery from poisoning by cytisin can generally be effected when it is possible to maintain the respiration for a sufficient length of time. Death is always the result of asphyxia. The exact chemical proof of poisoning by cytisin is extremely difficult. Comparative experiments with aqueous and alcoholic extracts of the seeds, ripe and unripe pods, flowers, leaves, bark, and roots, prove the poisonous nature of all these parts, and that cytisin is the sole poisonous agent in them.

2. *The Occurrence of Cytisin.*—The supposed laburnin-acid of Mr. Scott Gray, is a mixture of inorganic and organic acids. The poisonous properties observed by him were due to the presence of a small quantity of cytisin, and the alleged narcotic action is altogether erroneous. Cytisin is also present in the black seed-pod. About 500 grammes of the separated pods was found to contain a proportionately large amount of cytisin. The fat oil extracted from the seeds by ether, of a clear yellow colour and agreeable flavour, is not poisonous. Cytisin had been already found by the writer and Professor Husemann in three other species besides *Cytisus Laburnum*, viz. *C. alpinus*, *supinus*, and *elongatus*. During the previous year, the writer had examined, in reference to the presence in them of cytisin, and their poisonous properties, several other species. *C. Weldeni*, *sessilifolius*, *capitatus*, and *hirsutus* gave positive results, both by chemical analysis and experimenting on frogs. With *C. nigricans*, on the other hand, no poisonous substance could be obtained from the pods, seeds, or bark. This circumstance is of special interest, since this species is separated by English botanists, following Grisebach, into a distinct subgenus. Of the three subgenera of Grisebach, *Laburnum*, *Eucytisus*, and *Lembotropis*, the first (including *C. Laburnum*, *fragrans*, and *sessilifolius*) and the second (including *C. capitatus*, *supinus*, *elongatus*, and *hirsutus*) are poisonous; while the third, including *C. nigricans*, appears to be harmless. Dr. Marmé promises a further contribution, with reference to the poisonous effects of cytisin on the human body.

EMULSION OF ALMONDS.

BY H. P. REYNOLDS.

The officinal emulsion of the U. S. P. forms an elegant and suitable vehicle for the administration of many pungent or acrid medicines, but no apothecary cares to spend time for its extempore preparation, and of course it cannot be kept on hand on account of the readiness with which it ferments.

Experimenting recently, by request of a physician, for a satisfactory vehicle for chloral hydrate, I found the emulsion of almonds peculiarly adapted to the purpose, both by reason of its agreeable taste and its thick consistency almost completely obscuring the pungency of the drug. Chloral is now so largely administered in that class of diseases accompanied by an irritated and sensitive condition of the mouth and throat that this seemed a point gained. And it may not be amiss to state here that syrupus acaciæ, slightly flavoured with orange-flower water and essential oil of almonds, is a very agreeable vehicle for the chloral.

Finding I should be called upon to provide the emulsion for this purpose, it became desirable to have it on hand in a convenient and permanent form. I therefore contrived a preparation which I call a "Concentrated Emulsion of Almonds," and which is prepared as follows:—

℞ Sweet Almonds (blanched)
Sugar,
Glycerin ("C. P."), each 1 oz.
Powd. Gum Arabic, 1 drm.
Water, 2 oz.

Rub to a uniform paste, strain through muslin and evaporate by a heat *not exceeding* 150° F., to the consistency of a fresh solid extract. Preserve in widemouth bottles of size for convenient use. It may be flavoured to suit; I have preferred orange-flower water and oil of almonds. When emulsion of almonds is prescribed, it is readily prepared as follows:—

℞ Concentrated Emulsion, 2 drm.
Water, sufficient to make 1 oz. of mixture.
Mix thoroughly.

It immediately assumes the milky hue and consistence of the officinal article, and cannot be distinguished from it, while it keeps without change and without drying. The idea may not be new to all your readers, but certainly is original so far as I am concerned, and I shall be happy if the suggestion proves useful to any of them, as it can hardly fail to do.—*American Journal of Pharmacy.*

DETECTION OF ALCOHOL IN CHLOROFORM AND CHLORAL HYDRATE.

A. Lieben, in the *Annal. der Chem. und Pharm.*, 1870, *Suppl.* Bd. viii. 2, describes a method of dedecting ethyl alcohol by the formation of iodoform. In the simple case when the presence of alcohol in a watery solution has to be determined, the sample is warmed in a test tube, a few drops of an iodinized potassium iodide solution are added, and afterwards a few drops of potassium hydrate solution. If the quantity of alcohol is not too small, a turbidity results by the formation of microscopically small yellow crystals of iodoform.

Hager finds this reaction very accurate, and states that it detects alcohol in liquids containing but $\frac{1}{2000}$ after about one day's standing. The crystals are remarkable and beautiful by the variety of their star-shaped arrangement. Hager suggests the following *modus operandi*:—The reagents used are solution of potassium iodide in 5–6 times its weight of distilled water and over-saturated with free iodine; 2, a solution of potassium hydrate of about 10 per cent. strength. To the liquid to be examined 5-6 drops of the latter solution are added. After warming to about 50° C., so much of the potassium iodide solution is added drop by drop that its colour, after gentle agitation, remains yellowish-brown; then the liquid is carefully discoloured by the addition of a few drops of the potassium hydrate solution. When set aside the iodoform crystals deposit, and are recognized under the microscope.

The process is obvious: it is effected not alone by ethyl alcohol, but by a number of different substances, among which are aldehyde, acetone, gum, sugar, lactic acid, methyl alcohol, propyl alcohol, and many volatile oils. The formation of iodoform does *not* take place with amyl alcohol, ether, ethyl chloride, chloroform, chloral hydrate, glycerin, phenol, and by acetic, benzoic, butyric, citric, formic, oxalic, succinic, valerianic and tartaric acids.

The following test is, according to Hager, superior to any for the detection of alcohol in chloroform and chloral hydrate:—

Chloroform.—To determine the presence of alcohol in chloroform, 2 vols. chloroform are mixed with 5 to 10 vols. of water, of about 50° C. The liquid, after some shaking, is poured on a filter previously completely saturated with water. The filtrate is then examined as described above. After twelve to twenty-four hours' depositing, the sediment is examined under the microscope.

Chloral Hydrate.—Chloral forms with ethyl alcohol chloral alcoholate, corresponding to chloral hydrate in its chemical and physiological properties. Since the equivalent weight of ethyl alcohol is five times greater than that of water, it is of considerable pecuniary advantage to the manufacturer to bring the chloral alcoholate into the market instead of the hydrate; besides, the former crystallizes finer and more solid.

The examination is made with a solution of the sample in distilled water, in the above given mode. When discoloring the iodinized liquid, each drop of the potassium hydrate solution produces turbidity, which, however, disappears on gentle agitation. If the sample contains alcoholate, the liquid remains more or less turbid, or deposits iodoform crystals after a time, although this is partly soluble in the presence of chloral. Of some commercial samples examined by Hager, Schering's chloral hydrate was the only one entirely free from alcoholate. —*Pharm. Centr. H.* 1870, no. 18.

More recently Schering calls attention to some more distinctions between chloral hydrate and chloral alcoholate; when warmed in a test tube in twice their bulk of water, the hydrate, as is known, dissolves readily, but the alcoholate melts without solution, and on cooling congeals under the water. Sulphuric acid, when warmed with chloral hydrate, remains colourless, whilst it turns brown with the alcoholate. When warmed in nitric acid of 1·2 sp. gr., chloral hydrate gives none or but a very slight reaction, whilst with the alcoholate a vehement reaction ensues under evolution of nitrous oxide gas.—*Journ. Pharm. from Pharm. Centr. H.*

THE SO-CALLED "OLIVES" OF SOUTHERN CHINA.

BY H. F. HANCE, PH.D., ETC.

In his excellent "Notes on Chinese Materia Medica," Mr. D. Hanbury refers to certain fruits known to foreigners resident in this country by the name of *Chinese Olives*; and he suggests the desirableness of more precise information being obtained in regard to them. Of those which Mr. Hanbury mentions as sold at Foochow and Shanghae, I have no knowledge at all; and the following observations relate exclusively to the fruit vended everywhere in the south of Kwang-tung province, of which there are two kinds,—the *U-lam*, or Black, and the *Pak-lam* or White Olive,—produced respectively by *Canarium Pimela*, Konig, and *C. album*, Ræuschel.

On these two plants and a third Cochinchinese species, occurring also throughout the Moluccas, Loureiro founded his genus *Pimela*,* which, by the consent of all subsequent botanists, was merged in *Canarium*, until again distinguished by the late Professor Blume, who considered it a "genus optimo jure dignum esse quod restituatur."† The only characters, however, by which it differs from *C. commune* and its allies consist in the thin foliaceous not fleshy cotyledons, and in the insertion of the stamens at the base instead of the margin of the disk; distinctive marks which Dr. Hooker very naturally regards as of merely sectional value.‡

Both the white and black Olives are a good deal grown around Whampoa, whilst I have seen none in the immediate neighbourhood of Canton, or in Hongkong, and their cultivation is therefore apparently local: I can gain no intelligence of their occurrence in a wild state. They are trees from twenty to thirty feet high, with a whitish trunk, and a close round crown of foliage,§ which in hot sunny days exhales a grateful balsamic odour; in which respect, as well as in general aspect, they resemble our common walnut. The two species, though perfectly distinct, are singularly alike, so much so, indeed, that even now, after having made them an object of special study, I am quite unable, in the absence of fruit, to tell one from the other at a few feet distance. Blume gives the following differential characters:—

Canarium Pimela; foliolis 9–11 oblongis acutis inæquilateris glabris, racemis lateralibus simplicibus.

Canarium album; foliolis 11–13 ovato-lanceolatis supra glabris subtus scabris, racemis confertis subterminalibus.

These are, however, never quite accurate, nor by any means sufficient for the discrimination of the two species; and, in their place, I propose the following, drawn up after a careful comparative examination of living specimens of each tree.

Canarium Pimela; petiolo petiolulisque viridibus, foliolis 4–5-jugis cum impari oblongo-lanceolatis 3–6 poll. longis $2\frac{1}{2}$–$3\frac{1}{2}$ poll. latis venulis elevato-reticulatis, racemis plus minus compositis, drupis pedicellis clavato-incrassatis 5–7 lin. longis suffultis fusiformibus utrinque obtusis subtrigonis 20 lin. longis immaturis glauco-viridibus maturis purpureo-nigris lævibus, putamine obtuse fusiformi lævi.‖

Canarium album; petiolo petiolulisque alutaceis, foliolis 5–6-jugis cum impari oblongo-lanceolatis $2\frac{1}{2}$–4 poll. longis 12–16 lin. latis venulis supra non prominulo-reticulatis, racemis simplicibus, drupis sessilibus ovoideis 15 lin. longis immaturis flavido-viridibus maturis sordide flavidis valde rugosis, putamine acute fusiformi ruguloso.

I should remark that, when dried, the leaves of both species have the veinlets prominent, but the network is much closer and finer in those of the white olive.

As regards the mode of using these fruits, the following is the information I have myself gathered, from personal observation and inquiry of the natives:—The white olive is either eaten fresh, in which state its strongly resinous flavour renders it disagreeable to the

* Fl. Cochinch. ed. Willd. vol. ii. p. 494.

† Mus. Bot. Lugd.-Bat. vol. i. p. 220.

‡ Gen. Plant. vol. i. 325. The *flores longe pedicellati*, assigned as a character in this work, do not occur in *C. album*.

§ The name by which these trees are properly known to foreigners, and their dense tufted foliage, recall to mind the Homeric—

῞Ηδε δ' ἐπὶ κρατὸς λιμένος τανύφυλλος Ἐλαίη.
Odyss. xiii. p. 346.

‖ The three very slightly elevated bands, scarcely conspicuous, are represented far too prominently in Konig's figure (Ann. Bot. vol. i. pl. 7, fig. 1. g.).

European palate, or is placed, when quite ripe, in tubs filled with salt, stirred about continually, and, after the lapse of a day taken out and dried. In this state it is hawked about in great abundance, and tastes much as the European olive might be expected to do, if removed from the brine in which it is kept and allowed to dry, with an appreciable *soupçon* of turpentine superadded. I have been told it is regarded as a preventive of sea-sickness. The black olive is never eaten raw, but only after having been steeped for a few moments in boiling water. Thus prepared (and packed in jars, with the addition of a little salt, when desired to be preserved), it is of a fine purplish-red colour, like well-made fresh pickled cabbage, and has some resemblance in taste to freshly pickled mango, a flavour to me not unpleasant, but *de gustibus non est disputandum*. This fruit is held in much higher esteem than the other, and it is usual to keep a strict watch over it as it ripens to prevent depredation. I have seen a man who was found luxuriating in the umbrageous coma of a tree to which he could lay no claim, with a basket full of the fruit in his possession, tied "spread-eagle" fashion to the trunk for nearly a day, the monotony of his durance being varied by periodical flagellations.

Loureiro thus describes the reputed qualities of the two olives:

C. album. Drupæ muria conditæ olivis Europæis similes sunt colore, et quodammodo etiam forma et sapore; sunt autem saluberrimæ, ita ut medici non eas denegent ægrotis, experientia docti digestionem et appetitum cibi promovere.

C. Pimela. Drupæ muria conditæ frequenter apponuntur mensis, non minus sapidæ quam olivæ, sed stomacho graves.

For the following notice of these trees, extracted and translated from a description of the 'Memorabilia of Kwangtung,' published in 1801, I am indebted to my friend Mr. W. F. Mayers, H.M.'s Acting Consul for Che-foo.

"The *Yüeh Chung Kien Wen* states as follows:—Of the *Lan* there are two species, the black and the white. Of both the tree grows high and perfectly straight, usually with the trunk quite devoid of branches except at the summit, where it throws out its crown. There are male and female [trees], the male having flowers [only] and the female fruit. The males are properly called *Lang-kung* [*i. e.* male or 'sir' *Canarium*), and do not produce fruit, but if brought in contact with the female the fruit forms. The fruit resembles that of the *Tsao* (Jujube, or Chinese Date), about an inch or more in length, and is devoid of angles. The earliest growth hangs downward, those grown later point upwards. The fruit is ripe in the eighth or ninth month, when the cultivators mount the tree by means of ladders, and knock the fruit down with sticks. Another way is to make an incision of about an inch [in width] in the trunk, on its east side and to rub in some coarse salt, which causes the fruit on the east side to fall down spontaneously; and similarly on the three remaining sides of the tree. The white *Lan*, if not eaten until after the *Peh Lu* period (8th September), does not cause sickness. Its qualities are heating. When eaten, the tapering points at either end should be removed. On first being chewed, the flavour is bitter and astringent, but after a time the flavour develops itself and turns sweet. The colour is white. When boiled in water at a high temperature the colour changes to a pale green, and its fragrance becomes as that of the *Lan* (*Epidendron ?*), so that it sweetens the breath. Of the black *Lan*, the fruit is larger, and the flesh has greater substance. Its qualities are mild, and its flavour astringent, with a slightly sweet taste. It should be boiled in tepid water until it becomes soft and the purple skin puffs out, when it is fit to eat. If the water be cold, it will emit a gummy exudation; and if too hot, the flesh will harden, so that it is important to use tepid water only. In the southern portion of the Pwan-yü district the black *Lan* is largely grown, and the fruit, after being deprived of its stone, is cooked and preserved with brine as an article of merchandise, which has a sale far and near."

The stones of some species of *Canarium* are beautifully and elaborately carved by the Chinese; and, when set in gold, or separated by gold filigree beads, form exceedingly handsome brooches or bracelets. These are popularly supposed by foreigners, and even by many Chinese, to be cut out of *peach-stones;* though a very cursory inspection will show that this is a fallacy. Amoy is renowned for this kind of work, and, so highly is it esteemed, that some beads I purchased on the spot, to have made into a bracelet, cost me a dollar (4*s.* 3*d.*) each; a very large sum, when the slight remuneration in China for skilled labour and the cost of native living are borne in mind. These stones, so far as I can judge from the sculptured specimens, seem too large to be the produce of *Canarium Pimela.* They may either belong to a distinct species, or to one of those alluded to by Mr. Hanbury, respecting all of which I may, perhaps, hereafter succeed in gaining some reliable information.—*Journal of Botany.*

PREPARATION OF COLOURED CEMENTS THAT WILL HARDEN IN A SHORT TIME.

BY PROFESSOR BOETTGER.

If finely-pulverized chalk is stirred into a solution of soda-water glass of 33° B., until the mixture becomes thick and plastic, a cement is obtained which will harden in between six and eight hours, possessing an extraordinary durability, and alike applicable for domestic and industrial purposes.

If any of the following substances be employed besides chalk, differently-coloured cements of the same general character are obtained.

1. Finely pulverized, or, better still, levigated stibnite (grey antimony or black sulphide of antimony), will produce a dark cement, which, after burnishing with an agate, will present a metallic appearance.
2. Pulverized cast-iron, a grey cement.
3. Zinc dust (so-called zinc grey), an exceedingly hard grey cement, which, after burnishing, will exhibit the white and brilliant appearance of metallic zinc. This cement may be employed to advantage in mending ornaments and vessels of zinc, sticking alike well to metals, stone and wood.
4. Carbonate of copper, a light green cement.
5. Sesquioxide of chromium, a dark green cement.
6. Thenard's blue (cobalt blue), a blue cement.
7. Minium, an orange-coloured cement.
8. Vermilion, a splendid red cement.
9. Carmine red, a violet cement.

—*The New York Druggists' Circular.*

Turpentine as an Antidote to Phosphorus.—Personne's statement that turpentine acts as an antidote to phosphorus, by preventing its oxidation at the expense of the oxygen in the blood, having been called in question by Vigier and Currie, Köhler and Schimpf have repeated Personne's experiments, and report the following results in the *Berliner Med. Wochenschrift*:—(1.) Commercial oil of turpentine is a good antidote to poisoning by phosphorus; there is no fatty degeneration of the tissues, nor is there any free phosphorus in the urine or fæces of animals experimented on. (2.) Phosphorus and turpentine oil form in the stomach a compound resembling spermaceti. In dogs this was found to be readily excreted, or the phosphorus passed away slowly oxidized in the urine.—*Wiener Medizin. Wochenschrift.*

Californian Acorns.—Considerable discussion took place in the *Times* last autumn as to whether acorns were suitable for employment as food for cattle; and the evidence adduced certainly favoured a negative view. Dr. Robert Brown, however, tells us that those produced in California by several species of oak form an important article of food. "The acorns of California are mostly large, and the trees in general produce abundantly, though in some years there is a great scarcity, and much misery ensues among the poorer natives. The acorns are gathered by the squaws, and are preserved in various methods. The most common plan is to build a basket with twigs and rushes in an oak-tree and keep the acorns there. The acorns are prepared for eating by grinding them and boiling them with water into a thick paste, or by baking them into bread. The oven is a hole in the ground about eighteen inches cubic. Red-hot stones are placed in the bottom, a little dry sand or loam is placed over them, and next comes a layer of dry leaves. The dough or paste is poured into the hole until it is two or three inches deep; then comes another layer of leaves, more sand, red-hot stones, and finally dirt. At the end of five or six hours the oven has cooled down, and the bread is taken out, an irregular mass, nearly black in colour, not at all agreeable to the eye or to the palate, and mixed with leaves and dirt."—*Nature.*

Geranium dissectum.—The *Geraniaceæ*, taken as a whole, are by no means noted for their economic properties. In Tasmania, however, a form of the common *Geranium dissectum* having a thick rootstock is employed by the aborigines, who are in the habit of digging up the large, fleshy roots and roasting them for food. About Launceston it is called "native carrot," and is common throughout the colony. The typical form of *G. dissectum* is generally diffused over the temperate regions of the northern hemisphere in the Old World, where it is annual. In the Eastern United States a biennial or annual form, *G. carolinianum*, takes its place, the typical *G. dissectum* being only known as an introduced weed; although connecting-links between the two may readily be detected. West of the Rocky Mountains the stock often appears to be perennial, and it cannot then be distinguished from some of the Australian forms.—*Nature.*

DRUG MARKET NOTES.

The annual official statement of the imports of drugs, etc., is not yet issued by the Board of Trade; but from the commercial returns published of the imports, deliveries and stocks in the docks and various other London warehouses, a fair estimate may be formed of the activity of the trade in the Metropolis of the principal articles.

Aloes.—The imports last year were 3408 cases, 29 kegs and 588 gourds, and there were delivered for home use and export 3092 cases, 83 kegs and 747 gourds. This is about 400 cases and 170 gourds less than in 1869.

Aniseed, Star.—The imports were 195 chests and the deliveries 226 chests, being 250 less than were delivered in the previous year. The stock is small, compared with former years.

Arrowroot.—The imports were 7560 casks and 14,157 boxes and tins, the deliveries 9740 casks and 13,540 boxes and tins, being rather higher than 1869, but about the average of previous years. The stock in the docks, etc., is 10,346 cases and 20,000 boxes and tins, which is rather below the average stock of previous years.

Balsam.—Under this general head the imports of the year are given at 1244 casks, etc.; the deliveries at 1528 and the stock 539 casks.

Bark, Medicinal.—Imports 536 casks and cases and 23,203 serons, etc.; deliveries 430 casks and cases and 18,953 serons, which is about the average of the previous two years; stock 465 casks and 8629 serons, which is double the stock at the close of 1869.

Beeswax and Vegetable Wax.—Imports 594 bales and serons, 2824 casks and cases and 4186 cakes; deliveries 381 bales, 3783 cases and 3881 cakes, which is about the average of the two previous years. The stock is almost much the same as in the close of 1869.

Camphor.—Imports 8371 packages against 15,237 in 1869; deliveries 6432 against 12,037 in 1869; stock also large, 8460 packages.

Cardamoms.—548 chests; deliveries 605; stock 48. All much below the figures of 1869.

Cocculus Indicus.—Imports 1967 bags, etc.; deliveries 1546; stock 2216. There is a large, increasing consumption of this drug, of which in 1866 only 103 chests were taken.

Colombo Root.—Imports 674 packages; deliveries 531; stock 2065 packages.

Cubebs.—Imports 723 bags; deliveries 1075; stock 1806.

Gums.—

Ammoniacum.—Imports 261 packages; deliveries 230; stock 208.

Asafœtida.—Imports 559 packages; deliveries 499; stock 111.

Benjamin.—Imports 1738 packages; deliveries 1445; stock 1641.

Galbanum.—No imports; stock 7 cases.

Gamboge.—Imports 373 packages; deliveries 328; stock 163.

Guaiacum.—Imports 100 packages; deliveries 171; stock 7.

Kino.—Imports 87 packages; deliveries 55; stock 127.

Myrrh, East India.—Imports 376 packages; deliveries 263; stock 247.

Tragacanth.—Imports 164 packages; deliveries 86; stock 146.

Ipecacuanha.—Imports 695 casks and bags; deliveries 609; stock 356.

Jalap.—Imports 740 bales; deliveries 485; stock 447.

Nux Vomica.—Imports 5273 packages; deliveries 4213; stock 3535.

Oil, Castor.—Imports 41 casks, 1212 cases and 35,704 duppers and tins; deliveries 36 casks, 1894 cases and 40,906 duppers and tins; stock on hand 30 casks, 681 cases and 19,484 duppers and tins. The trade in castor oil keeps steady, the annual proportions not varying much.

Oil of Aniseed.—Imports 203 cases; deliveries 382; stock 58 cases.

Oil of Cassia.—Imports 109 cases; deliveries 281; stock 412.

Opium.—Stock 467 chests, etc., which is higher than in any of the previous four years: no particulars of imports or deliveries.

Rhubarb.—Imports 2217 chests; deliveries 2006; stock 1889.

Sarsaparilla.—Imports 2213 bales; deliveries 2150; stock 694 bales.

Senna.—Imports 2209 bales, etc.; deliveries 2275; stock 1090.

Turmeric.—Imports 1771 tons; deliveries 1628; stock 1912 tons.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 25, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

ADULTERATION.

EVER since the time when ACCUM startled the world by the publication of his work entitled 'Death in the Pot,' the subject of adulteration has excited great popular interest, and at times inordinate alarm. Attempts have been made to obtain protection against the practice of adulteration by the formation of supply associations, but these and other less respectable projects arising out of the dread of being poisoned by our daily meat and drink were short-lived and unsuccessful. Few subjects have been more mercilessly encumbered with nonsense and exaggeration in the statements put forward, and it is mainly owing to this circumstance that there has been great difficulty in devising and instituting any thorough and efficient measures for dealing with adulteration. On the other hand, it is with many still a question whether adulteration is really practised at all or to any great extent. In saying this much it is, however, necessary to guard ourselves against the imputation of in any degree apologizing for adulteration, and it is the more necessary to do so since this Journal is the organ of a class of traders to whom the provisions of Adulteration Bills are intended to apply, and for whom we confess to think that there would be less possibility of an admissible excuse being made than for dealers in food or drink.

But at the same time we protest against the absurdities perpetrated by popular writers and by legislators who deal with the subject of adulteration, and we believe it would scarcely be possible to imagine any evidence more strongly in favour of this view than is afforded by the Draft Bill published in another part of this week's Journal. We have not space at present to do more than refer to the strange limitation of the provisions in the Bill to the *admixture* of food, drink and drugs with ingredients other than they profess to be, to the sale of articles containing ingredients injurious to health, and to the case of such adulteration being practised with the knowledge of the seller. The features of the Bill are, we believe, alone sufficient to prove fatal to it, for they leave altogether unprovided for the sale of spurious and counterfeit articles; they would involve the necessity of proving an admixture to be injurious, and they afford an opportunity for all kinds of evasion being practised by unscrupulous persons willing to avail themselves of the plea that they did not know they were selling adulterated articles or that the admixtures would be injurious.

THE PROPOSED POISON REGULATIONS.

THE *British Medical Journal*, in commenting on this subject, remarks that Mr. Simon has "wisely insisted on the introduction of" regulations* as to the kind of bottles to be used for lotions, etc., containing poison; and it then proceeds to censure the action of the Council of the Pharmaceutical Society in a manner which we do not think is merited. But at the same time we think it right to extract the remarks of our contemporary for the purpose of illustrating the views held in certain quarters, and since it is desirable at the present moment that Members of the Society, as well as the trade generally, should have before them all information regarding this question.

"In these regulations Mr. Simon has very wisely insisted on the introduction of the third series. With the perfectly characteristic selfishness which is common to all corporations, the Council of the Pharmaceutical Society had omitted them. They wished to protect the chemist, but were willing to leave the door as widely open as ever to all the calamities which spring from carelessness or ignorance of persons dealing with medicines once dispensed, although well knowing that this is a sadly fertile source of accidental poisoning. Such a course is peculiarly shocking to the conscience; and it is well that the Privy Council retained its power of guarding the public safety, which the Council of the Pharmaceutical Society were perfectly willing to throw overboard, apparently regardless of the sacrifice of life, provided that they could make a show of activity and save their privileges, while they conciliated their constituents. In this their conduct seems to us deserving of very severe and enduring censure. It will be satisfactory to the medical profession and to the public to learn of any mitigating circumstance. These regulations, however, are likely to meet with serious opposition from chemists who wish to pursue their business without regulations, and are unwilling to recognize any moral duty of the many to submit to precautionary measures which the few already voluntarily adopt. We may warn these gentlemen that prolonged opposition will end in more complete restriction. The adoption of such precautions was part of the parliamentary understanding on which they were secured a monopoly of the pharmaceutical trade; and the public safety demands them. The weakness of the Pharmaceutical Society's action in this matter lies in the anomalous and composite character of the Society. It is at once a trade-union society, aiming at the protection of trade interests, and a governmental regulating body, empowered to make binding regulations in the interest of the public; a school at which teaching is carried on for profit, and an examining body which gives diplomas to its own pupils, and enjoys a monopoly of that business in England. This fourfold capacity includes doubly conflicting duties; and it is obviously only by the utmost discretion, and a willingness properly to abandon the exclusive considera-

* See *ante*, p. 563.

tion of trade interests where they conflict with public safety and welfare, that this Society can be allowed to hold in its custody, duties and privileges which have very rarely been consigned to one body. An obstinate resistance to the demands of the Privy Council must lead to the recasting of the pharmaceutical monopoly, under conditions which will ensure that attention to public safety which is at present intrusted to the good sense and good feeling of the members of the Pharmaceutical Society."

CHLORAL HYDRATE.

We have received communications upon this subject from Messrs. Domeier and Co., Messrs. Gehe and Co., Messrs. Schœtensack, Mr. W. S. Squire, and Mr. A. H. Mason, but are unable to insert them this week in consequence of the great pressure upon our space consequent upon the discussion of the Poison Regulations.

THE CHEMISTS' BALL.

We had occasion, in a recent number, to refer to the success of the Chemists' Ball as a social gathering, and we are glad now to be able to report that the financial result has also proved very satisfactory. The Committee, after paying all expenses, have been enabled, from the surplus, to make a donation of Twenty Guineas to the Benevolent Fund, as they did last year. They have, moreover, by a unanimous vote, determined to present a testimonial to Mr. T. Donald Watson, in recognition of his exertions as Secretary to the Ball Committee since the first institution of that successful, and, we hope, now firmly established annual gathering. The testimonial is to be of the value of twenty guineas, and is to be purchased by a Committee of Selection.

The second reading of the Bill to Amend the Law for the Prevention of Adulteration of Food and Drink and of Drugs, which will be found printed at p. 694, is fixed for the 22nd of March.

We have received from the Paris Société d'Acclimatation a circular bearing the signature of Dr. J. Léon Soubeiran, and stating that at a meeting of the Council of that Society, on the 27th January, a resolution was passed to the effect that the names of the sovereigns and princes of the German states engaged in the war with France should be erased from the list of patrons of the Society. This step is stated to have been taken, in consequence of the opinion that the bombardment of Paris has been carried on by the German armies in such a manner as to constitute an act contrary to the law of nations, and the fundamental notions of humanity.

It is announced in *Nature* that the Royal Commission on Scientific Instruction and the Advancement of Science is now in full work, and meeting two or three times a week.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

February 15th, 1871.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present, on behalf of the Privy Council.

Four candidates presented themselves for the Major Examination, and twenty-six for the Minor; the following passed, and were declared to be duly qualified to be registered:—

MAJOR (as Pharmaceutical Chemists).

Appleby, Calvert .... East Retford.
Masson, George .... London.
Storey, Edward Henry ...... London.

MINOR (as Chemists and Druggists).

*Wilson, John Herbert ...... Lee, Kent.
*Savory, Harry Banting...... Painswick.
*Peters, David .... Llandilo.
*Jones, Hugh Ellis .... Swansea.
*Pearce, Frank Tring........ London.
*Dresser, James .... York.
*Hackett, John Henry ...... Lincoln.
*Maddock, William Thomas .. London.
*Iredale, Thomas............ Leeds.
Equal. { *M'Neil, James Norton ...... Macclesfield.
{ *Martin, William Thomas .... Lewes.
*Humphreys, John .... Staines.
Richards, James Griffith .... Newport, Mon.
Margetson, James Francis ... Norwich.
Richardson, Thomas H....... Norwich.
Dowson, Joseph .... London.
Young, John Rymer .... Warrington.
Lord, Frederick .... Boston.
Edey, George .... Rochester.
Crofts, Henry Baptiste ...... Cranbrook.
Watson, Samuel .... Belper.
Connor, Thomas Haigh...... Wakefield.
Thompson, George Alfred.... Tunbridge.

The above names are arranged in order of merit

FIRST OR PRELIMINARY EXAMINATION.

Certificates presented by the undermentioned were accepted in lieu of this Examination:—

Flinders, Matthew Tom ...... London.
Worsley-Benison, Henry Worsley Seymour .... Reading.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Fourth General Meeting of this Society was held at Britannia Chambers on Friday evening, January 21st; the President, Mr. Atherton, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. Atherton expressed his hearty thanks for the vote of condolence passed at the previous meeting.

The Hon. Secretary announced that the 'Pharmaceutical Journal' had been received during the month, as also a number of specimens of argal, etc. from Messrs. Matthews, of Bristol, and a vote of thanks was recorded to the respective donors.

The proposed Poison Regulations were then con-

* Passed with Honours.

sidered, and after considerable discussion and the reading of a letter, expressing the opinion of an individual member, the following resolution was passed:—"That this Society views with regret the decision arrived at by the Council of the Pharmaceutical Society, to recommend to the notice of their Annual Meeting the institution of Compulsory Poison Regulations."

The formation of the Museum was then brought forward, and Mr. Atherton agreed to supply specimens of chemicals, and Mr. Rayner the various roots. A fund for the furtherance of the same object was then formed, and contributions to the amount of £3. 5*s*. were promised.

The Annual Supper of this Society was held at the Maypole Hotel on Tuesday evening, the 7th of February; the President, Mr. J. H. Atherton, in the chair, the vice-chair being occupied by Mr. Fitz Hugh, the Vice-President.

After the usual loyal toasts and that of the medical profession, Mr. W. H. Parker expressed the pleasure it gave him to propose "The Pharmaceutical Society and Council." As the governing body of the profession, it commanded their respect, and they would all wish to contribute to its prosperity. They could readily sympathize with the Council in the many difficult matters they were called upon to decide; and, perhaps, never had a more particular subject been brought before them than that of the proposed Compulsory Poison Regulations. It was unnecessary for him to say how much he was opposed to any compulsory measures. A thorough change had been wrought in the constitution of the Council by those regulations, and he thought the new Council must have some very good reasons for now recommending that which many of them formerly objected to. Under any circumstances he objected to the compulsion, but he hoped the discussion by the Council and members at the Annual Meeting would result in the adoption of a thoroughly practical measure, free from anything objectionable to the members generally. There was one other subject which he (Mr. Parker) wished to mention. The income of the Pharmaceutical Society must be something like £7000 or £8000 a year, a considerable portion of which was gathered from the provinces, and he would like to see a portion of this money applied freely to the various provincial associations requiring aid for promoting the educational object for which they were established. As before observed, a large portion had been drawn from the provinces, and he thought it only right that the Pharmaceutical Society, who are unable to educate the number of students at the present time requiring instruction, should make some sort of return in aiding those societies that acted as so many feeders of the parent Society, which eventually reaped a corresponding benefit from their efficiency and extension. Nottingham had the honour of being represented in the person of their worthy President, Mr. Atherton, and he thought they might rely on his efforts to do what he could to promote the welfare of such societies, and in calling upon them to respond to the toast, he begged to couple therewith the name of Mr. Atherton.

Mr. Atherton, in responding, expressed the pleasure he felt in being associated with such a body of men as the present Council; and assured them that whatever might be the differences of opinion on particular questions, they might take it for granted that the truest and best interests of pharmaceutists and chemists generally throughout the country would be safe in such hands. After referring at some length to the questions affecting the welfare of their body, and in special reference to the remarks of Mr. Parker, Mr. Atherton explained the position of the Council in reference to the proposed poison regulations, and deprecated the action of the Privy Council in the matter. Personally he objected to the principle of compulsion, and thought that a code of simple regulations coming as a recommendation from the Council would have answered every purpose, would have been favourably received by the trade and generally adopted. The onus of any one neglecting these or other suitable precautions would be thrown upon the individual, and their responsibility would neither be increased nor diminished if the regulations were to be compulsory. The majority of the Council were in favour of the resolutions being adopted, and their opinions were entitled to respect, but in a matter of such importance, and in the face of so much opposition to any interference with the freedom of the trade, he thought that the Council would do well to take the opinion of the chemists throughout the country before the final decision was taken at the annual meeting in May. Another point for their consideration was the one-sided nature of these proposed regulations. They did not apply to surgeons or dispensaries, but simply to chemists; he would like to know, if chemists were compelled to submit to compulsory regulations, why should not the same principle be applied to all who dealt in and made use of the articles proposed to be scheduled? In conclusion, he thought that if the matter were properly represented to the Privy Council, some other arrangement might be arrived at, more satisfactory to the majority.

The President proposed the toast of the evening, "Success to the Nottingham and Notts Chemists' Association," and referred to the advantages offered to those who choose to avail themselves of the opportunities, and to the moral obligation of all the chemists within the influence of the Society to support it in every possible way, after congratulating the members upon the success which had attended their efforts during the past session, expressed his gratification that the Council of the Pharmaceutical Society had intimated their readiness to assist such Societies by grants of money, books, or apparatus, according to the wants of each case.

The other toasts proposed were, the President, Mr. Atherton; the Vice-President, Mr. Fitzhugh, and Council; the Treasurer, Mr. Rayner; the Hon. Secretary, Mr. Mayfield; the Lecturers to the Society, Mr. Elder and Mr. Mayfield; the Ladies. After having enjoyed a most agreeable evening, the meeting separated.

SHEFFIELD PHARMACEUTICAL AND CHEMISTS' ASSOCIATION.

A Meeting of this Association was held on Wednesday, February 8th, when A. H. Allen, Esq., F.C.S., Chemical Lecturer to the Association, delivered an interesting lecture upon "Our Weights and Measures, with some Proposed Alterations and Improvements."

The President, Mr. Dobb, occupied the chair, and there was a moderate attendance.

The lecturer said that measures of length had first been taken from the various parts of the human body, and we thence had the foot, the cubit, the span, the hand's-breadth, the inch, and the nail; but such standards were highly unsatisfactory, varying as they did in different individuals and nations. Until recently, the English inch was defined to be the length of three barleycorns, taken from the middle of the ear, and placed in contact end to end; now, however, the inch bore a relation to the length of a pendulum vibrating seconds. In establishing a standard of length it was desirable that it should be readily reproducible on an accurate mathematical basis, in the event of all reliable copies being lost or destroyed, and there would be a much better chance of its universal acceptance, if it were not localized. The most philosophical system at present established was that of the French, who took as their standard the length of a line passing through Paris, and extending from the Equator to the Pole, and then dividing this by 10,000,000 they obtained the "metre," equal to about thirty-nine of our inches.

Professor Piazzi Smyth, who had carefully taken the dimensions of the Great Pyramid, had found that the height bore to twice the base the ratio 3·14159, or the same as the diameter of a circle bears to the circumference. The capacity of the stone trough in the interior, usually called the "sarcophagus," was exactly four British quarters of wheat. Its length was *about* 50 English inches, and *exactly* $\frac{1}{10000000}$th of the earth's diameter. The diameter of the earth measured 500,500,000 inches, so that if the inch were increased in length by $\frac{1}{1000}$th part (an amount quite inappreciable) it would be exactly $\frac{1}{50}$th of the length of the sarcophagus, and $\frac{1}{500000000}$th of the diameter of the earth. Such an increase would make a cubic foot of water weigh exactly 1000 ounces, instead of being supposed to do so, as at present. Mr. Allen was firmly impressed with the superiority of a decimal system of weights and measures, but he thought it would be easier and better to "patch" our present system than to adopt the French. The alterations he advocated would not be very extensive, and therefore the more likely to be taken up. He would propose to make the pound avoirdupois (weighing 7000 grains) a *measure* as well as a weight, and it was already used by druggists in the form of the sixteen-ounce bottle. He then proposed a new weight and measure of $\frac{1}{10}$ lb., which was about the capacity of a wineglass, and for which he suggested the name "verre" (the French for glass) or "ver." A weight and measure $\frac{1}{10}$ of this, equal to 70 grains, to be called a "newdrachm" (in one word), and which was sufficiently near in value to the present drachm to be at once substituted in the majority of cases. A weight and measure $\frac{1}{10}$th of this would be equal to 7 grains, and therefore called a "septem."

A gallon of water weighs 10 lb., so, if this were made a weight as well as a measure, no further change in it would be necessary. A weight and measure equal to 10 gallons would weigh 100 lb., and might be called a "hundredweight" and abbreviated as "hwt." The manifest absurdity of calling the present weight of 112 lb. a "hundredweight" would facilitate the change proposed. A weight and measure equal to 20 hwt., and weighing 2000 lb., would replace the present ton of 2240 lb. It might be called a "tone," or, still better, a "newton,"—a name indicating its parentage, and recalling to mind the great discoverer of gravitation. Our system of weights and measure would then stand thus :—

7 Grains	=	1 Septem, S.	=	$\frac{1}{1000}$ lb.
10 Septems	=	1 Newdrachm, Nd.	=	$\frac{1}{100}$ lb.
10 Newdrachms	=	1 Ver, V.	=	$\frac{1}{10}$ lb.
10 Vers	=	1 Pound, lb. or P.	=	1 lb.
10 Pounds	=	1 Gallon, G.	=	10 lb.
10 Gallons	=	1 Hundredweight, Hwt.	=	100 lb.
20 Hundredweights	=	1 Newton, Nt.	=	2000 lb.

Of course the half-gallon bottle, or "Winchester quart," could still be used, and it would be convenient to have a ½-lb. measure of the capacity of an ordinary tumbler (8 oz.), which might be called a "beaker," "rummer," or "tumbler." The smaller weights would scarcely be employed except by chemists and druggists, and could at any time be expressed in decimals of a pound. The change to such a system would take place with infinitely less opposition and dislike than if the French system were adopted.

The proceedings concluded with a cordial vote of thanks to the lecturer.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The Ordinary Weekly Meeting of this Association was held in the Council Room, Mitre Chambers, on Thursday evening, February 9th. The minutes of the previous meeting having been affirmed, a paper was read by Mr. Binns upon 'The Medicinal Use of Vegetables and their Preparations.' The author said that he had lost faith in the present system of administration of vegetables and their preparations as curative agents, on these grounds :—that every plant, or part of a plant, which is medicinally useful, owes its active properties and action on the human frame to one or to several substances formed in, and generally peculiar to that plant, of which they are said to form the active principle; that science is almost dumb as to the mode of formation of those active principles and their ultimate cause; and the results of all published investigation point to their uncertainty in quantity. What is the cause of the medicinal influence of various plants on the human frame? Taking into consideration the undisputed fact, that one species of plant produces a different kind of effect on the human frame from another species, we are led to the conclusion that these effects are due not to any substance or substances which the several species possess in common, such as vegetable fibre, starch, etc., but to some substance which occurs in, and is generally confined to, each individual species. This inference is borne out by the results of chemical investigations into the composition of the matter of plants; thus nux vomica seeds are found to contain a principle to which has been given the name of strychnia; atropia has been found, and found only in the belladonna plant. Now the physical action of these principles has been ascertained by experiment to be mainly and practically the same as that of the plants themselves, and on account of this the name 'active principles' has been assigned to them.

He then gave an account of the growth of a plant, and argued that just as one man cannot, by reason of his very nature, deposit fat or flesh or bone in large quantities, but forms an extra amount of muscle, while another man, fed on the same food, developes bone to an alarming extent, to the consequent diminishment of his muscular fibre,—the same cause operated in the vegetable kingdom, in varying the proportions of body and active principle in each individual plant. Considering the vegetable fibre, etc., to correspond to the bone and flesh of animals and the active principles, etc., to the blood and muscular fibre, facts point to the inference that the proportion between them is regulated by the organic quality or nature of the seed from which the plant sprang. If this be the case, then the weight of a plant has no relation to the amount of active and peculiar principles which it contains. But the British Pharmacopœia assumes virtually that the amount is exactly the same in each of several plants of the same weight.

Mr. Binns then read the following results of various experiments on the composition of the substance of plants :—

Miller's 'Organic Chemistry' tells us that the "composition of opium varies greatly even when it is not adulterated; also, that morphia is its principal sedative constituent, and its salt, the meconate, forms from one-seventh to one-sixteenth of its weight," which certainly leaves a wide margin for variation.

Thomson, in his 'Materia Medica,' states "There is one disadvantage in prescribing opium, that is, we can never rely upon the strength of the specimen." Analyses of various kinds of opium yielded the following results to various operations :—

Sample.	Percentage of Morphia.
Smyrna	About 8.
Egyptian	5.
Algerian	About 6½.
English	Irregular.
French and German	16 to 20.
Indian	3·21–10·5.
Chinese	2·5.

Cinchona barks subjected to analysis with the view of ascertaining the amount of quinine and cinchonine contained, gave the following :—

Sample.	Quinine.	Cinchonine.
Best Calisaya	3·8	
Middle ,,	2·5	
Carthagena	1·04	1·35
Best Red Bark	2·65	1·51

This shows a variation of 50 per cent. of the whole quantity of quinine contained in yellow barks; and that a doctor in ordering tinct. cinchonæ flav., thinking to produce an effect represented by $1\frac{1}{2}$, may be deceived, and obtain instead an effect represented by 1.

Under the head of aconitina Royle states that "both the juice and tincture of aconite are occasionally given without any effect at all; and, on the other hand, several cases of poisoning by small quantities of the tincture have occurred. These different results are probably dependent upon variations in the amount of active principle in the root used. This is the alkaloid aconitina, which is the only preparation of the drug which is constant in strength." Again, in speaking of *conium*, he states that "some preparations of conium contain no conia, either from defective preparation or subsequent change, and this accounts for the discrepant statements concerning the efficacy of conium as a medicine." Ought he not rather to say that the reason lies in the uncertain quantity of conia in the plant?

An analysis of euphorbium, given in Pereira's 'Materia Medica,' shows as a result of one experiment 60·8 per cent. of resin, as of another 43·77. An analysis of croton oil yielded to Brandens 17 per cent. of fixed oil and crotonic acid, to Miers 60 per cent., and Pelletier 50 per cent.

Pereira also states that the red veins of rhubarb are the seat of the astringent properties, and it is undeniable that these vary in quantity.

Foxglove has been the subject of repeated investigations, but until recently with no satisfactory results. From 1000 grs. of the leaves, Henry obtained 140 to 150 grs. of digitaline.

Scammony analysed by Marquart gives the following results:—

Aleppo Scammony, per cent. of Resin.	81·25—32·5
Antioch " " .	18·5 — 8·5
Smyrna " " .	6 —37

The percentage of resin in jalap as found by Marquart varied from 12·08 to 13·33.

Aloes analysed by different persons gave:—

	I.	II.	III.
Per cent. of Resin . .	6·25	42	35
" Aloesin . .	81·25	52	60

The author considered that all the extracts, tinctures, decoctions, etc., contained in the Pharmacopœia of 1867 were but shams unless it were a known and proved fact that all vegetables, their leaves, roots, barks, etc., contain a constant and fixed percentage of active principles, whereas he thought he had proved the very reverse to be the case. Now, are we going to continue in a blind adherence to a system which, at the least, is open to grave doubts; or shall we discard it? As a remedy for this uncertainty, he recommended that all present should do their best to pave the way towards the use of the active principles from which the drugs derive their healing properties instead of tinctures, etc.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Seventh General Meeting of the Session was held at the Royal Institution, on Thursday evening, the 16th inst.; the President, Mr. John Abraham, in the chair.

Mr. A. W. Wilson and Mr. I. L. Benson were elected members, and Mr. A. Brownrigg was elected an associate.

Several donations to the Library were announced.

Mr. Thomas F. Abraham stated, that in accordance with his promise at the last meeting, he had repeated his experiments upon the crystal hydrate of chloral, supplied by Messrs. Morson and Son, and again obtained from 70 to 72 per cent. of chloroform.* He had also tested it in comparison with the cake chloral hydrate, bearing Liebreich's guarantee, and found no difference whatever; he therefore thought that Mr. Mason's report was incorrect. He had also examined a portion of cake hydrate of chloral, formerly supplied by Messrs. Morson and Son, which also produced from 70 to 72 per cent. of chloroform.

The President said that the publication of the paper read by Mr. Mason on the 22nd December last, had attracted much attention, and it was his opinion that Mr. Mason's statements were inaccurate. The question had been taken up by Dr. Paul, and the results of his experiments showed differences in the character of the chloral in the market of only moderate extent.

Mr. Mason said, that in reading the paper in question, he distinctly stated that sample No. 9 only was an alcoholate of chloral; those samples which did not yield the legitimate percentage of chloroform, *upon his application of the ammonia test*, he considered were hydrated alcoholates, or mixtures of hydrate and alcoholate of chloral. Duplicate samples of the chloral salts which he had experimented upon had been sent for analysis to an arbitrator agreed on by some of those interested; the results of his experiments were to raise the chloroform percentage in some cases, and reduce it in others, but the relative value of the samples, appeared in the same order as arranged by himself.* Referring to Dr. Paul's paper, Mr. Mason said it should be borne in mind that the samples Dr. Paul reported upon were samples supplied from different sources *since* the publication of his paper. The samples he experimented upon were samples met with in the ordinary routine of business, in November and December last. He should be sorry if true and pure articles had been injured by his experiments, and with the assistance of several friends, was doing all he could to endeavour to arrive at the truth, and should he be proved erroneous, he should feel it a duty to state the same for the benefit of all those interested therein.

The President alluded to the death of Dr. Sheridan Muspratt, and regretted that an eminent chemist had been taken from amongst us. He would not attempt to determine his position as a man of science, but he noticed an admirable trait in his character, supplied by the preface to his 'Dictionary of Chemistry,' in his acknowledgment of the valuable assistance rendered to him by a member of the Council of this Association, Mr. Martin Murphy, F.C.S.

Mr. Charles Blood then read the paper for the evening upon the 'Year-Book of Pharmacy, 1871,' in which he gave a *résumé* of each of the principal articles contained in the volume lately issued by the British Pharmaceutical Conference, and urged all those who had not yet joined that Society to do so at once and obtain the book for themselves.

The President said the members would all feel indebted to Mr. Blood for his interesting criticism of the Year-Book; he thought the work would prove a valuable adjunct to progress in pharmaceutical knowledge, and did not doubt that each year the work would be improved.

Mr. Alfred E. Tanner said he had noticed some discrepancies in the formulæ given; for instance, in the formula for Smith's chlorodyne, p. 29, it is printed "Theriacæ ad f℥iv;" this should be ℥v according to formula published by Mr. Smith in the Pharmaceutical Journal, which gives twenty grains of morphia in five fluid ounces.

A vote of thanks was cordially voted to Mr. Blood, who in reply stated that his object had been simply to bring the book before the notice of those who were not members of the Conference, and he trusted all present would be induced to join its ranks.

* Since this meeting, I have *voluntarily* gone into this analysis with Mr. T. F. Abraham, and have much pleasure in confirming his results.—A. H. Mason.

* There is an obvious inconsistency between these two statements.—Ed. Pharm. Journ.

CHESTER CHEMISTS' ASSOCIATION.

At a Meeting of the Chester Chemists' Association' held on Monday last, the proposed regulations for the keeping, dispensing and selling of poisons were discussed, and the following resolution in reference thereto was adopted:—

"That, taking into consideration the public safety, as well as our own protection, the regulations for the storing, dispensing and selling of poisons, recommended by the Council of the Pharmaceutical Society, be adopted by the members of this Association; and that the Secretary be requested to forward a copy of this resolution to the Secretary of the Pharmaceutical Society. This Meeting also begs to recommend that no medicine for internal use shall, under any circumstances, be sent out in poison bottles."

Proceedings of Scientific Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

After several years' intermission, the Pharmaceutical Meetings in connection with this Institution have been resumed. On the 18th of October last a meeting was held, the object of which was to consider the best mode of conducting the future meetings. The Registrar was authorized to publish notice of meetings in the *Public Ledger;* also to give wide circulation to cards of invitation. A committee, consisting of Israel J. Graham, Professor Maisch and Dr. Pile, was appointed to draw up a plan and submit the same to the next meeting.

At this meeting Professor Maisch exhibited a specimen of the so-called African saffron, obtained from Chicago. Upon examination this proved to be Carthamus, safflower (*C. tinctoria*), much broken and discoloured. Also a sample of gum sennaar, a species of Acacia, at about two-thirds of the price of gum arabic. It comes into commerce *viâ* Trieste, from a port on the Red Sea. Externally it resembles a good quality of true gum arabic, forming a mucilage which is not so bland as that produced from true gum. It may be distinguished from the *Acacia vera* by the following characters:—A mucilage from true gum mixed with Goulard's Extract produces slight opalescence. A mucilage from gum sennaar filters slowly with milkiness; the addition of liquor ammoniæ to the filtrate of true gum produces in twenty-four hours a slight opalescence; added to the filtrate from gum sennaar, a gelatinous mass is formed in the same space of time.

At the Meeting on November 15th, the order of business was as at meetings generally. The Committee appointed at last meeting reported the following suggestions:—

1. As it is of primary importance that a general interest should be felt or created in the attendance of these meetings, the Committee would recommend that an earnest invitation be extended to the members of the College, and all others who may desire to participate in the proceedings; to produce at each of our meetings either written or oral contributions on subjects pertaining to chemistry or pharmacy, or the commercial relation of drugs. Upon the conclusion of such communications, the presiding officer of the meeting to call for any remarks that may be elicited by the subject thus introduced.

2. That there should be appointed annually a Standing Committee, consisting of three members, whose duty it should be to propose subjects for discussion at any of our meetings, whenever there shall be a lack of material voluntarily contributed by members.

3. That a box or other suitable arrangement be provided for the reception of written queries, anonymous or otherwise, which members may desire to propound, relating to any subject connected with the shop or laboratory; which queries may be taken up for discussion either at the meeting in which they are proposed or at a subsequent meeting.

4. That this Committee be requested to obtain, from time to time, the services of any who may favour the meeting with lectures suited to the occasion.

These recommendations were adopted. The Committee appointed for the ensuing year was Charles Bullock, Dr. Pile and Professor Maisch.

Dr. Bridges exhibited a specimen of marked glass cut by a new process, in which sand is blown with great force against the glass, certain portions of which is protected by wire of different shape, or by gauze or lace, the figure of which is left on the smooth glass surface, while the meshes are etched by the attrition of the sand. Wherever the sand strikes, the impression made resembles ground glass. This process will probably supersede ground glass in many of its uses.

Dr. Pile exhibited a sample of insoluble gun cotton, made in the form of gun wad, being very explosive.

Dr. Bridges explained the principle of the spectroscope, its discovery and the wonderful results obtained by its use. Although this species of chemical investigation is but in its infancy, the results so far obtained are marvellous, the minutest quantity of a substance being detected by an undeniable and never-failing colour. After a very interesting exhibition of spectroscopes by the Professor, assisted by Mr. Bullock, the meeting adjourned.

At the Meeting held on December 20th, among other things, Dr. Pile propounded and solved the following problems:—

1. To reduce alcohol of given strength to proof.
2. To reduce alcohol to any required strength.
3. To make any required quantity of either of the above.

Answer to Problem 1.—Ascertain the percentage of the alcohol used, and to every 50 parts, by measure, add water sufficient to make the whole number of parts equal to the percentage. For example, if the alcohol be 85 per cent., then to 50 ounces add water sufficient to make 85 ounces.

Answer to Problem 2.—To as many parts of the given alcohol as are indicated by the percentage required add sufficient water to make the number of parts of the mixture equal to the percentage of the given alcohol. For example, if it is desired to make an alcohol of 30 per cent. from an alcohol of 95 per cent., take 30 parts of the alcohol, add water sufficient to make 95 parts of the mixture.

Note.—In the first example we do not add to the 50 ounces of alcohol 35 ounces of water, but sufficient to make 85 ounces of the mixture. This is owing to the condensation occurring where alcohol and water are mixed.

Answer to Problem 3.—Make the following proposition: As the percentage of the alcohol given is to that of the alcohol required, so is the quantity desired to the quantity of the alcohol to be taken; and to this quantity of alcohol water sufficient must be added to make up the required quantity. For example, suppose 80 ounces of alcohol, of 75 per cent., is desired to be made from 95 per cent. alcohol,—as 95 : 75 : : 80. This gives 63 3-19 ounces of 95 per cent. alcohol to be taken; to this add water sufficient to make 80 ounces.

Alcohol = 89·49 per cent. by volume.
Dilute „ = 46· „ „
Strong „ = 94·65 „ „

Mr. Bullock exhibited a specimen of anhydrous alumina, found in large masses weighing many pounds. Specific gravity, 3·60; next to the diamond, the hardest substance in nature. Surface studded with crystals of sapphire.

Professor Maisch read a paper "On the Precipitation of Quinia by Iodide of Potassium from an Acid Solution." Also a paper entitled "Decomposition of Acetate of Morphia in Solution."*

Professor BRIDGES made some remarks on the vinegar plant.

Professor PARRISH read a paper (illustrated with diagrams) upon "Petroleum, its Mode of Rectification and Refinement, together with its Commercial History," speaking of the immense use during the last few years, almost superseding other illuminating oils of commerce, and exposing some of the immense frauds practised during the coal-oil rage.

Several specimens of petroleum and its derivatives, in their different stages of refinement, were exhibited.

MONTREAL CHEMISTS' ASSOCIATION.

At a late Meeting of the members of the above Association a draft petition, to be presented to the Dean and Faculty of Medicine, relative to the percentage system, was submitted for adoption. The Association finds that the practice which obtains favour with certain members of the medical profession, of sending their prescriptions for mere pecuniary considerations to a particular druggist, is so serious a drawback to the trade and unfair to the public, that it should be represented to the Faculty. The junior members of the Association naturally argue that unless they happen to be so fortunate as to be able to fee some of the leading physicians in order to obtain their influence, their chances of advancement are small.

The report of the Committee on the matter was favourably received, and will be finally discussed at the next meeting.

The above Association is now called "The Pharmaceutical Association of the Province of Quebec," and has received a charter from the Government. The Association has a staff of professors, and classes on botany, chemistry and materia medica, etc.

CHEMICAL SOCIETY.

At the Meeting of the Chemical Society on February 2nd, a discussion took place on Professor Frankland's paper on the "Development of Fungi in Potable Water."

The President, Professor WILLIAMSON, after having expressed the thanks of the Society to Professor Frankland for his communication, asked whether he had taken into account the phosphoric acid present in the sugar.

Professor FRANKLAND said he thought the phosphoric acid would have been excluded by the crystallization of the sugar.

Dr. HEISCH was glad that his statements had been confirmed by Dr. Frankland's experiments, but in two important points the results obtained were diametrically opposed to his own. The first was that water retained organic germs after filtration through animal charcoal. During the last three years he had investigated large quantities of water, and on no single occasion had he found fungoid growth in such water after it had been passed through a charcoal filter. The other point was that while Dr. Frankland had said that the cellular formations obtained from white of egg in sugar solution were very similar to the sewage fungi, he had found them easily distinguishable. The sewage fungus was very small, perfectly spherical, transparent and generally grouped in grape-like bunches. Its development and decay is very rapid. Six hours after the mixture of the sewage matter with the sugar solution the spherical cells will appear; in six hours more they will grow into mycelia, and a short time afterwards the whole vegetation disappears,—the whole growth being accompanied by the odour of butyric acid, which is wanted during the development of fungi from the white of egg. The latter, too, have a different appearance from the sewage fungi.

Mr. BELL remarked that samples of sewage water kept for some time would purify themselves by a process of natural decay. Of seven samples that he had obtained from Dr. Frankland, four, which had been obtained in 1869, did not become turbid when submitted to the sugar test; while three that had been obtained in October and November last became turbid. He had some doubt as to the cause of the turbidity. Shortly after Dr. Heisch read his paper, a sample of water taken from a well in Drury Lane was brought for examination. Some sugar was added to a portion of the water and in about twelve hours the water became turbid. When examined microscopically it was found to be alive with the little creatures he had been in the habit of seeing in vegetable extracts. He at once inferred that these organisms, and not the fungoid development, caused the turbidity. As the result of various experiments with phosphates, he found that when calcic phosphate was present bacteria were largely developed. He had also passed water through animal charcoal, and in every instance bacterian bodies were produced in the water on the addition of sugar. Pure water, into which ignited charcoal had been introduced, might be kept a considerable length of time without developing any organisms on the addition of sugar.

Dr. VOELCKER said, in confirmation of the statement that sewage easily undergoes alteration, that a jar of sewage having been left for some months loosely covered lost nearly all its ammonia, whilst its nitric acid had increased. He also said that iron sponge far surpasses charcoal for filtering purposes; water filtered through it would stand Dr. Heisch's test perfectly. Spongy iron is obtained by calcining with charcoal the residues from burnt copper pyrites.

Mr. WARINGTON said that probably the spongy iron purified the water by removing the phosphates that would be retained by the hydrated ferric oxide with which the sponge is largely crusted. He also called attention to the fact that fresh animal charcoal gives up some of its phosphates to the percolating water, which was not the case with charcoal that had been in use some time. This he thought might help to explain the difference in the results obtained by Dr. Frankland and Dr. Heisch.

Dr. DUPRÉ asked Dr. Frankland whether he had boiled the sugar solutions? He himself had obtained no fungoid vegetation when this had been done.

Dr. FRANKLAND said usually they were not boiled, but that in one experiment the sugar had been burnt to caramel, the water previously heated with caustic soda and potassic permanganate, all the salts added to it being heated to a high temperature, and in that experiment more splendid fungi were obtained than in any other. The discrepancy between his observation as to the efficiency of charcoal, and those of Dr. Heisch, seemed to be explained by Mr. Warington's remark. As to the two kinds of cells, he did not consider them identical, but yet they were similar. He had not paid any attention to the odour of butyric acid during the development of the sewage fungi. In reply to Mr. Bell, he said the samples of effluent water had been examined a day or two after collection. With reference to Dr. Voelcker's remark, he said that the quick disappearance of the ammonia in sewage and sewage water had often been noticed by himself.

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"The First Principles of Biology" (Educational Course). By Prof. Huxley.

TUESDAY ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.

* PHARM. JOURN., 3rd Series, Vol I. p. 661.

WEDNESDAY...*Pharmaceutical Society of Great Britain*, at 8.30 P.M. "The Microscope and its Revelations." By Dr. W. B. Carpenter.
Society of Arts, at 8 P.M.—"The Principles of School Organization and Instruction as Advocated by the Society of Arts." By Rev. W. H. Brookfield, M.A.
Royal Medical and Chirurgical Society, at 8 P.M. Annual Meeting.

THURSDAY......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." By Prof. Odling.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.
London Institution, at 7.30 P.M.—"The Action, Nature and Detection of Poisons." By F. S. Barff.

FRIDAY ....*Royal Institution*, at 9 P.M.—"The Latest Scientific Researches in the Mediterranean and Straits of Gibraltar." By Dr. W. B. Carpenter.

Parliamentary and Law Proceedings.

A BILL TO AMEND THE LAW FOR THE PREVENTION OF ADULTERATION OF FOOD AND DRINK AND OF DRUGS.

Whereas the practice of adulterating articles of food and drink and drugs for sale, in fraud of Her Majesty's subjects, and to the great hurt of their health and danger to their lives, requires to be repressed by more effectual laws than those which are now in force for that purpose:

Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. Every person who shall wilfully admix, and every person who shall order any other person or persons to admix, with any article of food or drink, any injurious or poisonous ingredient or material to adulterate the same for sale, and every person who shall wilfully admix, and every person who shall order any other person or persons to admix, any ingredient or material with any drug to adulterate the same for sale, shall for the first offence forfeit and pay a penalty not exceeding £50, together with the costs attending such conviction, and for the second offence shall be guilty of a misdemeanour, and be imprisoned for a period not exceeding six calendar months, with hard labour.

2. Every person who shall sell any article of food or drink with which to the knowledge of such person any ingredient or material injurious to the health of persons eating or drinking such article has been mixed, and every person who shall sell as pure and adulterated any article of food or drink, or any drug which is adulterated or not pure, shall for every such offence, on a summary conviction of the same before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justices of the peace court, or before the sheriff substitute of the county, or before justices at petty sessions or a divisional justice in Ireland, forfeit and pay a penalty not exceeding £20, together with such costs attending such conviction as to the said justices shall seem reasonable; and if any person so convicted shall afterwards commit the like offence, it shall be lawful for such justices of the peace to cause such offender's name, place of abode, and offence to be published, at the expense of such offender, in such newspaper or in such other manner as to the said justices shall seem desirable.

3. And be it enacted that the Pharmacy Act, 1868, and the Act 23 & 24 Vict. c. 84, for preventing the adulteration of articles of food and drink, shall be deemed to be incorporated in this Act.

4. Any purchaser of any article of food or drink or drugs in any district, county, city, or borough where there is a public analyst appointed shall be entitled, on payment to such analyst of a sum not exceeding 10*s.*, to have any such article analysed, and to receive from such analyst a certificate of the result of his analysis, specifying whether, in his opinion, such article is adulterated, and also whether, if it be an article of food or drink, it is so adulterated as to be injurious to the health of persons eating or drinking the same.

5. Any person who has been convicted of any offence punishable by this Act by any justices may appeal to the next general or quarter sessions of the peace which shall be held for the city, county, town, or place wherein such judgment or conviction shall have been made, or in the case of the conviction having been before a sheriff substitute in Scotland, then the appeal shall be to the sheriff of the county, provided that such person enter into a recognizance within two days next after such conviction, with two sufficient securities, conditioned to try such appeal, and to be forthcoming to abide the judgment and determination of the Court at such general or quarter sessions, or sheriff, and to pay such costs as shall be by such Court awarded; and the justices before whom such conviction shall be had are hereby empowered and required to take such recognizance; and the Court at such general or quarter sessions, or sheriff, are hereby authorized and required to hear and finally determine the matter of every such appeal, and may award such costs to the party appealing or appealed against as they shall think proper.

6. If any such conviction or judgment or order of forfeiture shall happen to be made within six days before any general or quarter sessions of the peace shall be held for the city, county, town, or place wherein such conviction shall have been made, the person who shall think himself aggrieved by any such conviction may, on entering into a recognizance in manner and for the purposes before directed, be at liberty to appeal either to the then next or next following general or quarter sessions of the peace which shall be held for any such city, county, town, or place wherein any such conviction shall have been made, on giving six days' notice to the complainant of his intention to appeal.

7. Any person who shall have been convicted by any justices or sheriff substitute of any offence punishable by this Act, in respect of the selling of any article of food or drink or drugs which shall have been manufactured according to any process patented before the passing of this Act, either by the patentee or owner of the patent, or by any person carrying on his business or otherwise claiming under him during the continuance of such patent, may, instead of appealing to the general or quarter sessions of the peace or sheriff of the county, apply in writing within five days after such conviction to the justices or sheriff substitute, to state and sign a case for the opinion of one of the superior courts of law thereon, in like manner as under the statute of the 20 & 21 years of her Majesty, c. 43, he might have applied to the justices to state and sign a case, and thereupon all such proceedings shall take place upon and in relation to such application, and all such provisions shall be applicable thereto, as would have taken place upon and in relation thereto, and been applicable thereto, under the provisions of the said last-mentioned Act; and in Scotland, for the purposes of such appeal, the justices or sheriff substitute may state and sign a case for the opinion of the Court of Session, in like manner as the justices in England and Ireland may, for the opinion of the superior courts of law under the said Act, and the Court of Session shall have in relation thereto the like powers as the superior courts have under the said Act, and all the other provisions of the said Act shall be applicable to such appeals.

8. In England the provisions in the Nuisances Removal Act for England, 1855, as to procedure, and the provisions of the Act of the 11 & 12 years of the reign of her present Majesty, intituled "An Act to Facilitate the

Performance of the Duties of Justices of the Peace and of Sessions within England and Wales with respect to Summary Convictions and Orders," and in Scotland the ordinary rules regulating the procedure of justices of the peace so far as the same are respectively applicable, shall extend and apply to cases arising under this Act in England or Scotland; and all moneys arising from penalties under this Act in any county, city, district, or borough where there are analysts appointed under this Act shall, when paid or recovered, be paid in England and Ireland to the vestry, district board, commissioners, county treasurer, or town council for such county, city, district, or borough respectively, to be applied for the general purposes of such vestry, district board, commissioners, county, city, or borough respectively, and to the collector of rogue money for each county in Scotland.

9. All proceedings under this Act in Ireland as to compelling the appearance of any such person or of any witness, and as to the hearing and determination of such complaints, and as to the making and executing of such orders, and as to the applications of fines, amerciaments, and forfeited recognizances imposed or levied under this Act at petty sessions, shall be subject in all respects to the provisions of the "Petty Sessions (Ireland) Act, 1851," as the same is amended by the "Petty Sessions Clerk (Ireland) Act, 1858" (when the case shall be heard in any petty sessions district), and to the provisions of the Acts relating to the divisional police offices (when the case shall be heard in the police district of Dublin metropolis), so far as the said provisions shall be consistent with any special provisions of this Act; and when any fine or penalty is imposed at any of the divisional police offices of Dublin metropolis, or by the justices in any corporate town, under the provisions of this Act, such fines and penalties shall be paid over to the same purposes and appropriated and applied in the same manner as is now by law authorized in respect of fines and penalties imposed at such divisional police offices, or by the justices in any such corporate town respectively.

10. In Ireland any person who has been convicted of any offence punishable by this Act may appeal to the next court of quarter sessions to be held in the same division of the county where the order shall be made by any justice or justices in any petty sessions district, or to the recorder at his next sessions where the order shall be made by the divisional justices in the police district of Dublin metropolis, or to the recorder of any corporate or borough town when the order shall be made by any justice or justices in such corporate or borough town (unless when any such sessions shall commence within seven days from the date of any such order, in which case, if the appellant sees fit, the appeal may be made to the next succeeding sessions to be held for such division or town); and it shall be lawful for such court of quarter sessions or recorder, as the case may be, to decide such appeal, if made in such form and manner, and with such notices as are required by the Petty Sessions Acts respectively hereinbefore mentioned as to appeals against orders made by justices at petty sessions; and all the provisions of the said Petty Sessions Acts respectively as to making appeals and as to executing the orders made on appeal, or the original orders where the appeals shall not be duly prosecuted, shall also apply to any appeal or like order to be made under the provisions of this Act.

11. The expense of executing this Act shall be borne, in the city of London and the liberties thereof, out of the consolidated rates raised by the commissioners of sewers of the city of London and the liberties thereof, and in the rest of the metropolis out of any rates or funds applicable to the purposes of the Act for the better local management of the metropolis, and in counties out of the county rate, and in boroughs out of the borough fund, or out of the rogue money in counties in Scotland.

12. Nothing in this Act contained shall be held to affect the power of proceeding by indictment, or to take away any other remedy against any offender under this Act.

A Child Poisoned by Mistake.

The following paragraph appeared under the above heading in the *Manchester Guardian*, Feb. 18th, 1871:—

"Yesterday, the City coroner (Mr. E. Herford) held an inquest touching the death of Florence Adelaide Livesey, 11 months old, daughter of Mr. G. Livesey, engraver, Bradshaw Street, City Road, Hulme. The mother of the child said she had been in the habit of giving the deceased child "infants' preservative," to induce sleep. She kept the bottle beside another containing liniment for a rash on the child's chest. The liniment was got from a chemists' firm named Wild and Fox.* On Wednesday night her husband handed her the liniment bottle instead of the sleeping cordial, and the mistake was not noticed until it was too late to save the child. The liniment bottle was not labelled 'poison.' The jury returned a verdict of 'Accidental Death,' and censured the chemists for not putting a poison label on the bottle."

This was supplemented by the following letter:—

"Poisonous Medicines.

"*To the Editor of the Manchester Guardian.*

"Sir,—As one of the jurymen on the inquest on the child who was poisoned, I beg to correct your report. It was not a chemist, but a medical man, who supplied the liniment to the parents, and who was censured by name by the jury, because that liniment, with which the child was poisoned, was not labelled poison in the way that all chemists would do;—had it been done, the poor child might in all human probability have been now living.—I am, etc. "Thos. Norris.

"100a, Clopton Street, Feb. 20, 1871."

A Druggist Fined for Selling Methylated Spirit without a Licence.

On Monday, at the Huddersfield Police Court, Robert Robinson, Chemist and Druggist, Lockwood, was fined £12. 10*s.* for selling methylated spirit without having a licence. The supervisor of excise, who attended to prosecute, stated that the defendant had been served with ample notice that he was not entitled to sell the spirit without having a licence.—*Leeds Mercury.*

Suicide by Carbolic Acid.

An inquest has been held at Liverpool upon the body of John Perkins, a brushmaker, forty years of age. The deceased had lately been in low spirits and rambled in his talk. On the evening of his death he went to bed after supper. His landlady hearing the sound of a fall in his room, went upstairs and found him lying on the floor in a dying state. There was a very strong smell of carbolic acid. She found a half-pint bottle with a little in it on the table, and a tumbler smelling very strongly of the acid. Medical assistance was called in, but the man was dead when it arrived.

The bottle, which was produced, was labelled "carbolic acid," but not "poison."

Dr. Bligh said that he was of opinion that the deceased died from poisoning by carbolic acid. The small portion left in the bottle was a mixture of carbolic acid, glycerine and water, with impurities.

The jury returned a verdict of "Suicide during temporary insanity."—*Liverpool Courier.*

Suicide by Morphia.

An inquest has been held at the German Hospital concerning the death of Frederick Meyer, aged nineteen.

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* On referring to the Register, we find that this is a misstatement. Messrs. Wild and Fox are not on the Register of Chemists and Druggists, but are, we presume, the proprietors of an open surgery.—Ed. Pharm. Journ.

A police-officer stated that he found the deceased lying on the grass in a field near the Brampton Road, South Hackney. He then appeared very ill. There was a bottle labelled "Morphia, Poison," close to his right hand. Upon witness lifting him up he said, "My name is Frederick Meyer and I am a German. I have taken poison. I have been two years in England and I am nineteen years old. I am a chemist. I will not tell who my family are." He was removed to the German Hospital, where he died two hours afterwards.

Dr. Blaister said that the deceased had taken 244 grains of morphia. One grain would be sufficient to cause death.

The jury returned a verdict of "Suicide while in a state of temporary insanity."

Obituary.

JAMES SHERIDAN MUSPRATT.

James Sheridan Muspratt, F.R.S.E., whose death we have previously recorded, was born in Dublin in 1821. He early evinced a taste for chemistry, and at thirteen years of age, having travelled through part of France and Germany, he entered the Andersonian University of Glasgow, where, for nine months, he studied in the laboratory of Professor Graham, whom he afterwards followed to London. Before he reached the age of seventeen he was entrusted with the chemical department of a large manufactory in Manchester, and published a paper on chloride of lime, which attracted considerable attention. Proceeding to America, he entered into a trading partnership which was not successful. Afterwards he went to Giessen, where he remained two years under Liebig. He then published a paper upon the sulphites, which appeared in Liebig and Wöhler's 'Annalen,' and shortly after he obtained the degree of Ph.D. In conjunction with Professor Hofmann, he prepared toluidine and nitraniline, two important organic bases. He also edited Plattner's 'Treatise on the Blowpipe.' In 1845 he left Giessen and visited various parts of Germany, in order to become personally acquainted with her distinguished men. In 1847 he returned to Giessen, and spent four months in its laboratory, discovering several remarkable bodies produced from the sulphocyanides of ethyle and methyle. A paper on this subject was printed in Liebig's 'Annalen,' as well as in the Chemical Society's Transactions. In 1848 he produced a paper on the Selenites; in 1849 he published some very interesting remarks in Liebig's 'Annalen,' on the Blowpipe Reactions of Strontia and Baryta. In 1851 appeared his paper on "Carmufellic Acid," a new acid from cloves, published in the proceedings of the Royal Society, and in the 'Philosophical Magazine.' But the most important act of his life was the foundation of a College of Chemistry in Liverpool, students from which are now occupying prominent posts or professorships in various parts of the globe. In 1854 a Glasgow publisher engaged Dr. Muspratt to write a Dictionary of Chemistry, which has commanded a large sale in England, America, Germany and France. He was elected a Fellow of the Royal Societies of Edinburgh and Dublin, and a member of the Société d'Encouragement in France; and the oldest university in America conferred upon him the honorary degree of M.D. He has lately published some treatises on the chalybeate springs of Buxton and other English watering-places.

On his return from Germany in 1848, Dr. Muspratt married Miss Susan Cushman, the celebrated actress, who died in 1859. He was the scientific director of the extensive chemical works at Flint, belonging to Messrs. Muspratt Brothers, of which firm he was a member. He died after a lingering illness, at the comparatively early age of fifty.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[146.]—FLAVOURED CASTOR-OIL.—In answer to *W. Smith*, the following amongst other forms, is found to be the best by "*Delta*":—

Heat 5 lb. of finest Italian castor-oil for half an hour over a slow fire till thoroughly liquefied, then beat up the whites of ten eggs and add to the oil, and when well mixed stir in 20 oz. of lump sugar dissolved in 12 oz. of water, and stir again; lastly, add 1 oz. of starch-powder dissolved in 20 oz. of boiling water. The mixture must then be kept stirred briskly with a "whisk" (such as is used in culinary) till quite cold. Lastly, add flavour to taste, and shake in large jar for an hour. Care must be taken that the above quantity at least is used at one time, or the operation will fail.—DELTA.

[155.]—GUM ACROIDES.—Under this name I remember obtaining specimens from the late Mr. Keating, of St. Paul's Churchyard, of one of the *Xanthorrhœa* resins of Australia, which there pass under the name of Black Boy, or Grass-tree resins. The particular species yielding the gum acroides is, I believe, *X. hastilis*. It is darker than gamboge, less uniform in appearance, and not entirely soluble in alcohol. It contains benzoic and cinnamic acids. It has been used medicinally to unite the edges of wounds, and in the form of tincture with opium in dysentery and diarrhœa, and it forms the base of a cement, being much used by the aborigines of Australia to fix their spear-heads. It is also used, I believe, for varnish purposes. Mr. Druce will find further information respecting it in a paper of mine on the gums and resins of commerce read before the Society of Arts in November, 1855, and published *in extenso* in their journal, vol. iv. p. 18. I can also let Mr. Druce have a specimen from my collection as shown in the New South Wales Department of the Paris Exhibition.—P. L. SIMMONDS.

Gum acroides, or acaroides, is a resin obtained from different species of the Liliaceous genus *Xanthorrhœa*, or Grass-trees. *X. hastilis* yields a large quantity. The trees are very common in New Zealand. The resin is also known as "Black-boy gum," "Botany Bay kino," "Grass-tree gum," etc.—J. C.

[171.]—BOTANICAL SPECIMENS.—Good directions how to dry plants as botanical specimens will be found in Oliver's 'Lessons in Elementary Botany,' p. 287. They are, however, too long to be inserted in the PHARM. JOURN.—H.

"*Herbarius*" requires only three mahogany boards, demy size, half a ream of Bentall's paper, and a 56 lb. weight or a press.—WETHERBY.

[172.]—CRYSTAL VARNISH.—"*Pater*" would be glad of a form for crystal varnish for coating negatives to preserve them while printing.

[173.]—UNITED STATES.—Could any reader of the PHARMACEUTICAL JOURNAL give me any information as to whether they have to pass an examination before they can commence business in America or not? If so, where information can be obtained as regards any such examination. —GUILLAUME, A.P.S.

[174.]—GRAIN MUSK.—"*Percontator*" would be glad to receive some information on the method used by the wholesale drug trade to "grain" musk.

[175.]—ESSENCE OF MUSK.—"*Percontator*" would feel greatly obliged for a practical formula for the preparation of a standard essence of musk from the pod musk, *i. e.* the pod and its contents, with a description of the process and solvents employed by manufacturing perfumers in preparing the same.

Correspondence.

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

Poison Regulations.

Sir,—You may imagine that I have watched very closely the correspondence appearing from week to week on the poison regulations, but until the publication in your last issue of a letter from Mr. Reynolds I had determined to take no part therein. That letter however reflects so seriously on the Council (of which he is a member) in their late proceedings, and personally on me as President, that I cannot longer remain silent.

That Mr. Reynolds should deem me unfit to hold the office of President will astonish no one who reads his imputation on the manner in which the duties of the Council have been performed, and his insinuation that a certain deficiency in myself has been the cause of mischief.

My present occupation of the chair was certainly not of my own seeking, and I should have vacated it ere this, had not the agitation on these very regulations assumed such a nature that my withdrawal would have seemed a desertion of duty, and a bequest of trouble to a successor who might have been less acquainted with the difficulties of the question. Had popularity been my sole object, I should wisely have declined to resume the Presidency in June last; my success had then quite "satisfied" my "highest ambition," and the body of the trade had most handsomely, as Mr. Reynolds's letter reminds me, "expressed their gratitude."

But when Mr. Reynolds suggests that my personal entanglement with Mr. Simon has brought the Council into a false position, I feel bound to assure him, and all who may share his opinion, that he is utterly mistaken. If ever there was entanglement between us, it was of an entirely different nature to the one now implied. Of all opponents to the restrictive clauses which the Privy Council sought to import into the Pharmacy Bill, I was (as Mr. Simon has said and would doubtless say again, although we may have forgiven past differences) the most "obstinate."

There is one point of the Act existing as proof of this, which Mr. Reynolds entirely misinterprets—the division of the schedule of poisons into two parts. After our Bill had passed the Lords, it was proposed in the Commons to apply all the formalities of the "Arsenic Act" *to every poison in the schedule.* In a long conference at the Privy Council office between Lord Robert Montagu, Mr. Headlam, Mr. Simon, and myself, I successfully opposed that proposition.

Immediately after, notices of equally objectionable amendments were put on the paper of the House by Mr. Lowe; one of them even went so far as to prohibit the sale of more than one "medicinal dose" of any poison without the order in writing of a legally qualified medical practitioner.

These amendments were discussed in the House, and, resulting therefrom, a conference took place between Lord Elcho, Mr. Lowe, Mr. Simon, Mr. Hills and myself, which ended in the compromise set down in the 17th section; *the division of the schedule into two parts, in order to liberate the articles in more common use from the restrictions applied to those in Part I.;* and the provision that vendors should comply with such regulations as might from time to time be made by the Pharmaceutical Society, etc.

Thus arose the "*tacit understanding*" which Mr. Reynolds now seeks to stigmatise as a "*secret treaty,*" and which may perhaps grow in his imagination, as it is "pondered over," into a "conspiracy;" it is so easy to advance step by step when one is predisposed to go in a certain direction.

The "tacit understanding" is that duty implied in the words of the first section, nothing more. The remedy, on the Society failing in its duty, rests with the House of Commons, which was, and may still be, in the mind to pass a more stringent measure.

And here let me draw attention to Mr. Reynolds's comparison of the style of the 1st and that of the 9th section. I hold the two occasions to be entirely dissimilar: the latter refer to a register which was wanted for immediate use,—indeed the Act could not be started without it,—and the order was that the Council "shall with all convenient speed" proceed to establish it.

As to the first section, the expression is not that the Council "may make regulations," but that all persons registered under the Act shall comply with such regulations as may from time to time be made. This surely implies not simply a power to make, but an expectation that regulations will be made.

Speaking of this "expectation" reminds me of one of the most remarkable passages in Mr. Reynolds's remarkable letter. He there charges some "*gentlemen officially connected with the Pharmaceutical Society*" with suborning evidence to suit the purposes of the Council. I can form no idea of the persons to whom he alludes, and although he talks of having "the best authority" for this assertion, I feel pretty confident he has been "gammoned." The editors of the *Pall Mall* and *Lancet* will probably give us some enlightenment on the point.

I read another article, couched in rather strong terms, in the *British Medical Journal* of last week; perhaps Mr. Reynolds will attribute that to the same source?

Mr. Reynolds chooses to call the Pharmacy Bill of 1865 an "expensive failure." It certainly was not expensive; and, although it failed to pass, it paved the way for the Act of 1868, and I cannot in any way admit that we have shown want of good faith in mentioning the obstruction which certain Chemists and Druggists caused to that Bill, or in our bearing towards them since.

The assertion in the "statement of reasons" that the Bill "No. 2" was the first *Pharmacy* Bill containing Poison clauses is perfectly true. The Society had always previously held, that although the education of the vendors should be an *imperative* condition of any Poison Bill, yet the provisions for their education, and the regulations for the trade in poisons should be contained in two distinct Acts of Parliament.

Mr. Reynolds takes exception to the conduct of the Council in delegating to a committee the "revision and issue of the statement of reasons." I can only tell him the paper so committed was carefully read over and approved by the Council, and the Committee had no power to alter it, beyond making the verbal changes rendered necessary by the discussion of the morning.

And now, Sir, although my letter may already appear too long, I must add a word or two on the "representative" character of our Council. Admitting fully that we are but delegates, I hold that we are *delegated to sit in Council, and there to exercise our judgment; frequently, and in such cases as this especially, to promote action on the part of the Society when that action tends to the common good;* and *that in the matter of these regulations the Society will act for itself, not by its delegates.* It will be a bad day for the Pharmaceutical Society when its Council is deprived of the right of private judgment, and when the members of the Society cease to respect themselves in the persons of their representatives!

Piccadilly, Feb. 21st, 1871. George W. Sandford.

The Journal, the Council and the Poison Regulations.

Sir,—In retiring from the Council a few months ago I hoped to have been able to leave entirely, or at least for a considerable time, the troubled arena of pharmaceutical politics; and were it not for a matter in which the honour and independence of the "Journal" is concerned, I should even now have allowed my views on recent events to have remained unexpressed.

Does the Council need to be reminded that the "Journal" is the property of the Society, and that, so far as they have control over it, such power is only held in trust for the Society? If they recognize this fact, I would ask how they can justify the employment of its official portions for purposes of partisan warfare? I put it thus pointedly, for no one who has closely followed the tone of the leading articles relating to the "Poison Regulations" can fail to see where the Editor ceases to speak for himself, and becomes, under pressure, the mere mouthpiece of a party who chance to be in power.

It happens that a majority of the present Council favour the imposition upon the whole trade of certain "poison regulations," and an attitude of obsequious obedience to the medical officer of the Privy Council; whilst an influential minority, backed by the sense of the members at large, as ascertained at the last Anniversary Meeting, desire independence of action within the limits of distinct (not imaginary) obligations. Now, if the majority of the Council, without any knowledge of the feeling of their constituents, endeavoured only to crush the opinion of the minority by insisting that their particular views should be advocated in a manner not open to those who differ from them, it might be regarded simply as an instance of very bad taste; but to take such action in the face of the decision of a general meeting of the members of the Society (the proprietors of the Journal), is an exhibition of tyranny in the use of temporary power, that needs a worse name than discourtesy.

I possibly feel this the more strongly as I had the misfortune to belong to that minority of the Council who, holding with the late Jacob Bell that "*the only practicable safeguard to the public is the proper qualification of all persons who administer or deal in poisonous substances*," have objected to the imposition of regulations the inconvenience of which to the trade as a compulsory enactment their very authors acknowledge, whilst not even their authors have ventured to predict that any real advantage to the public would follow their adoption. Would it not have been more dignified if the leading articles, instead of reproducing, without contradiction or explanation, paragraphs from other periodicals either false in fact or false in the impression they are intended to convey to the public mind, had been devoted to upholding the position of the Society and vindicating its honour? But the honour of the body is sacrificed, because it suits the purpose of a portion of the Council that the members should be frightened. In Mr. Bell's days chemists looked to the "Journal" for their defence against all outside enemies, and they were never disappointed. It is a painful reflection that now they are compelled to band themselves into associations for defence, not so much against the outside public as against the acts of their own Council.

There were many methods open to the Council of explaining its attitude of antagonism to the ascertained opinon of its constituents, if explanation had been the object sought. Obviously, the right method would have been to have invited the presence of reporters at the Council meetings when these matters were discussed, but it seems that that is much too liberal a measure for the present body. Still there were many others, such as, for instance, the circular which has been recently issued to the members. This particular document may not be very effective—it would be odd indeed if three foolscap pages of weak excuses did not carry their own condemnation, yet it has an interesting phase in the light it sheds on the authorship of at least one of the anonymous letters that have appeared in the Journal—but its issue is no outrage on the independence of the periodical which represents, or ought to represent, the Society at large.

Will you allow me to add a few words touching the proposed regulations? One of your correspondents ridicules the notion of police, or indeed of any inspection of pharmacies, under the impression apparently that "inspection" is a bugbear invented by objectors, and that it is a step which has never been entertained by the official mind. Does he forget that Lord Derby's Bill, which passed the House of Lords, provided for the appointment of examining inspectors; and that in Mr. Walpole's Bill, also a Government measure, the principle of police inspection was a prominent feature? Can anybody suppose the chance of such interference to be less now that we are unfortunately under the guardianship of the Privy Council than when, as heretofore, directly responsible to the Government in the person of the Home Secretary? If there be such an one, let him study the way the Privy Council (or their medical officer) used their newly-found powers when the Bye-laws and the Board of Examiners were matters under consideration. Surely it is humiliation enough that our Council were then compelled to rescind previous resolutions, and to enact laws referring to the internal economy of the Society which they did not approve, in order to save its whole machinery from being brought to a dead-lock by that body. If he wishes to know something of the Privy Council and their ideas of inspection, he might further study with advantage their relation to the medical profession in the matter of the Vaccination Acts; and if he desires to estimate the efficiency of their system as affecting public safety, he may find his data in the weekly mortality rates, or in a recent speech in the House of Commons by the Member for Westminster.

One word more, and I have done, and that on a subject which forbodes ill in its present aspect, namely, the want of unity which seems to exist between "town" and "country" interests, arising chiefly from want of knowledge of the various conditions of business. This was very manifest at the last anniversary meeting, not so much perhaps in respect to the "poison" question as in some others that were then discussed. Apart from principle, and the certainty of a system of inspection to follow, it can make little practical difference to the leading London chemist what regulations are made touching storage. He need hardly keep half the substances known as poisons, and his stock can be renewed at a few minutes' notice from his druggist or manufacturer; but it is a very different thing to men holding a similar position in small or middle-sized towns, and I am assured by some so situated that they find it almost impracticable to carry out faithfully even the regulations already in force under the Act.

The imposition of an irrevocable code of restrictions, whilst the present difference of opinion exists as to their general practicability, would be an act of great injustice; but let the Council of the Society recommend any well-considered scheme for voluntary adoption, and every chemist will give effect to it to the extent of his power. If this course were taken, no Parliament would sanction interference until it could be shown to be inefficient; and until then any compulsory legislation on the part of our own body is premature. Let town and country members pull together heartily, and we need fear little from outside.

Newcastle-on-Tyne, HENRY B. BRADY.
Feb. 20th, 1871.

POISON REGULATIONS.

Sir,—Much has been written in our Journal about the storing and dispensing of poisons; truly, it is a question of great importance to the trade, should the recommendations of Council be adopted, they will entail more and "quite unnecessary" labour. Surely our labours are more than sufficient for our remuneration. I do think the law, as it at present stands, is quite sufficient to guard the public against any mistakes. I should like statistics to be produced for the last twenty years of poisoning and suicides, and I dare be bound that a very small percentage has arisen from the carelessness of chemists.

As to the poison-closet, is it not likely to lead to more accidents, especially where young men are kept; for instance, one is preparing a prescription containing three active poisons, belladonna, aconite and morphia; he goes to this closet and takes out those three bottles, compounds his prescription, and in nine cases out of ten leaves those poisonous bottles on the counter: this might lead to very serious results; whereas, were those bottles on the shelves as at present (of course, marked "poison"), he would take one down, and replace it when done with. Indeed, my opinion is that all the arrangements for storing and dispensing medicines ought to be left entirely in the hands of chemists themselves. Surely, we as a body of responsible agents will and do take every precaution to guard against mistakes.

Chemists in every town ought to petition Parliament not to legislate in this most important matter, till the present law is found to be inadequate. Of course, it is of great importance to us to guard against mistakes, knowing the penalty, the forfeiture of our reputation, and perhaps the ruin of our families. This is more binding than closets or curious capped bottles, etc.

In conclusion, I hope the chemists in every town will bestir themselves and ask their representatives in Parliament to oppose such an absurd system in drug shops as poison-closets. Why, the whole shop might be placed in it, their name being "legion."

Liverpool. PESTLE.

Sir,—It was my intention to have written some strictures upon the "statement" of reasons sent out by the Society, but some of your correspondents—prominently Mr. Reynolds—have so clearly demonstrated its inconsistency, and so exhaustively treated the entire subject, that nothing remains for me but to enter my protest, along with my brother druggists, against any further restrictions being placed upon our trade, but more especially against the position taken by the Pharmaceutical Council in reference to this question. Had there been any real desire to "protect the public," the proposed regulations must necessarily have extended to all places where poisons were stored, and consequently to the dispensaries of public institutions, as well as to the "surgeries" of all medical men. It is by no means difficult to prove that the public safety would have been much better conserved by a strict surveillance of the last-named establishments than by any trade restrictions placed upon chemists and druggists. It is a notorious fact that the dispensing of medical practitioners is often carried on in the most flagrantly careless manner, and, so far as the poor dispenser is concerned, under the greatest possible difficulties. The entire "stock in trade" of a surgeon in what is termed a good practice will often not exceed five pounds sterling, whilst the heterogeneous character of the storing bottles would utterly appal the "public" were it admitted to a private *séance*. The most dangerous drugs or compounds may be seen standing side by side with the most harmless, both of them bearing a dirty paper label, illegibly written, and only distinguishable upon the minutest inspection. The morphia or strychnine will be dispensed by a neophyte in the shape of an errand-boy. Yet, forsooth, these "establishments" are to be exempt from any supervision, whilst the well-conducted and expensively-fitted shop or dispensary of the chemist, where neatness, order, cleanliness, and everything that is calculated to ensure the public against accident is strictly observed, must be periodically invaded by some officious Mr. Bumble. At whose instigation, I wonder, or for whose behoof are those changes to be made? To my mind, it seems something very like an "understanding" somewhere or other, which should be most vigorously protested against by the trade, and that, too, in good time. I should much like to see our Council change their position, and, instead of any "understandings" with the Medical Council, trying only to fulfil their trust by seeking to advance the practice of pharmacy, and to protect the interests of our trade.

CHEMIST.

[*** Whatever may be the proper view to take as to the proposed regulations, we cannot agree with the opinion that they should not be adopted because medical men neglect them. That argument, at least, appears to be fallacious.—ED. PHARM. JOURN.]

Sir,—So many opinions have been expressed in your Journal for and against regulations for the storage and dispensing of poisons that I almost blush to add to the correspondence, but the time seems to have arrived for inquiring, "What is it all about?"

We have had proposals, counter proposals, appeals to common sense, and appeals to the Council of the Pharmaceutical Society. We have "caught the ear" of the Council. A document is forwarded to us, setting forth the absolute necessity of passing poison regulations; and what is more, it assures us that the regulations, only passed, can become a dead letter. Is there any necessity to doubt the word of our Council after such a manifesto? Is it not apparent that the whole affair has been a practical joke, Mr. Simon and our Council shaking their sides with laughter while we have been shaking with apprehension. At least, no other conclusion can be drawn by

M.P.S. BY ELECTION.

Brighton, February 8th, 1871.

Sir,—Are pharmaceutical chemists considered capable of managing their own businesses, and is it intended to exempt "examined members" from the proposed restrictions regarding the storage of poisons (thus placing them on an equal footing with surgeons)? If not, of what earthly use is our Society, and for what purpose has our time and money been spent? I protest against interference on the part of a clique, who always want something to do, feeling convinced if personal considerations fail to ensure carefulness everything else must.

EDWARD BEEKS FORD.

Pontypool, Feb. 20th, 1871.

Sir,—May I ask why chemists and druggists are picked out by Government for surveillance by the Privy Council while oilmen, etc., though selling equally dangerous poisons unlabelled and without a caution, are permitted to go scot free?

GEORGE EADE.

72, *Goswell Road, February 16th*, 1871.

Sir,—Permit me, as an old hand, to suggest to the Council the propriety of sending a printed paper to each chemist in the kingdom, through the respective secretaries, to solicit their ideas relative to the using and storing of poisons; also to ascertain, as far as practicable, the number of deaths known to each, traceable to chemists.

I believe if this was done, the Council and also Government would be satisfied to leave us alone, and not burden us with rules and regulations, which, in the end, would produce more loss of life than there is under the present circumstances.

Cheltenham, February 17th, 1871. JOHN FINCH.

THE APPLICATION OF DISINFECTANTS.

Sir,—A few days since a Darmstadt physician called on me, and said that he had just arrived from Germany, in consequence of his brother having been seized with typhoid fever. The patient, a clerk in a City house, occupied good apartments, and his medical attendant desired that he should not be removed. The inmates objected to having their dwelling rendered uninhabitable by strongly-smelling disinfectants, and insisted on the use of an odourless disinfectant, or the removal of the patient. Under these circumstances I was asked to suggest what might be done. Chlor-alum was placed in cloths and in dishes in the room; it was diffused as a spray, and employed in the chamber utensils. The patient died, and the bedding and other articles were dipped in chlor-alum, then washed out in pure water, and lastly boiled and washed with soap and water.

My reason for publishing these details is to draw attention to the fact that the agents mentioned in your recent article,* with the exception of Condy's fluid, which is firmly believed by some good authorities not to be a fever-poison destroyer, could not have been used, and are often not used, when on sanitary grounds the application of a disinfectant is of paramount importance.

Since you have furnished a statement of the methods adopted in using carbolic acid, chloride of lime, sulphurous acid, and other disinfectants, it may not be uninteresting to your readers to have, in a few words, the rules which may be laid down for the employment of chloride of aluminium and its compounds.

We all know the importance of clearing a sick-room of superabundant furniture and trappings. If to light muslin curtains over the doors, windows and bed, cotton-wool or wadding, treated with chlor-alum, be pinned, antiseptic air-filters of great value are readily improvised.

A slight modification of Dr. Siegle's inhaler, made by Messrs. Krohne and Sesemann, of Duke Street, Manchester Square, affords a means for purifying every particle of air in a chamber by volatilizing a solution of one part of chlor-alum to twenty of water.

In the chamber commode and utensils some chlor-alum solution, or a powder which contains 30 per cent. of chloride of aluminium, will be of the greatest advantage. The late Mr. Francis Taylor, of Romsey, Hampshire, was the first to use chlor-alum powder in earth-closets, and wrote me repeatedly concerning the great efficacy of the material. He had long been seeking an agent for this purpose, and his untimely death prevented the fulfilment of a kind wish he had expressed of paying London a visit, with a view to discuss with me the whole subject of the disinfection of the excreta of the sick, and the application of the earth-closet system.

Dr. Septimus Gibbon was the first to draw attention to the fact that chlor-alum acted under certain circumstances very actively on vegetable fibres, and he was led to doubt its applicability to the disinfection of clothing. I have sought information from Manchester people, and was astonished to find that drying wet clothes before a fire, and many other simple expedients commonly resorted to, rotted the cotton fibre. This rotting is the bane of the bleacher. From the fact that we had used cotton-filters for months without injury to their structure, I was led to try some experiments, and I find chlor-alum the most harmless of disinfectants for clothes and bedding. The following rules must be attended to, viz.:

A solution of 1 part of chlor-alum (which is a 30 per cent. solution of chloride of aluminium) in 20, 30, or even 40 parts of water should be used in which to steep the articles to be disinfected. The longer they steep, the better; but a few minutes of complete submersion suffice. A golden maxim in disinfection is that liquid contact is more effectual for destruction than dry contact between fever germs and the disinfectant. The clothes thus steeped are allowed to drip, or the liquid wrung out of them. They are then placed in pure water, and, having been well steeped, may be placed again in pure water. Warm water washed the chlor-alum out most rapidly. After this, the articles may be boiled and washed as usual. The most delicate fabrics can be treated in this way, and not a particle of contagious matter can escape attack.

Chlor-alum, being odourless and harmless, can be used in the sick-room without danger or inconvenience.

JOHN GAMGEE.

1, *Great Winchester Street Buildings, E.C.*

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* See *ante*, page 625.

Poisonous Confectionery.

Sir,—In your Journal of the 14th ult., you report a case in which two tradesmen at Dublin were fined for selling poisonous confectionery. I regret to say this practice is not confined to that city. A short time since I purchased some comfits of a most respectable tradesman in Oxford Street, and my suspicions being aroused by the brilliant colours of some of the sweets, I examined them and found that chromate of lead, vermilion and other metallic poisons had been used in their manufacture.

On complaining to the vendor, he expressed his regret, furnished me with the address of the manufacturers, and said he would at once close his account with them, although he had been a customer for many years.

Wishing to do my utmost to repress an evil so pernicious to the health of children, I addressed to the firm the following letter:—

"*January 26th*, 1871.

"Gentlemen,—I recently purchased some comfits for my children from Mr. —, but having some suspicion of their appearance, I have examined them, and find the colouring-matter to be chromate of lead, vermilion and other metallic ingredients of a poisonous character. On complaining to Mr. —, he has given me your names as the manufacturers. Should you be indifferent of the consequences likely to arise (especially to very young and delicate children) from swallowing such noxious compounds, I would remind you that by using such colouring matters in your manufacture, you render yourselves liable to a penalty. If you refer to the Pharmaceutical Journal of January 14th, you will find the report of a case just decided in Dublin, where two tradesmen were fined for using similar ingredients in confectionery.

"After this intimation I hope you will see the policy, if not influenced by better motives, to at once discontinue this objectionable practice; but should I find at a future examination that these poisonous compounds are still used by you, I shall consider it my duty, in every possible way, to aid in the suppression of an evil, the extent of which we can hardly estimate.

"I am, gentlemen, your obedient servant,
"J. Robbins."

To which I received the accompanying reply:—

"*London, January 27th*, 1871.

"Sir,—In reply to your letter respecting colours used in our trade, we beg to say that the public have it entirely in their own hands; for example, in an article called barley-sugar, there is not a particle of colour in it; how much more wholesome to have that and several others without these glaring colours! which, we are informed MUST contain more or less of some chemical, which, if not prejudicial, at least has a tendency that way. We have our colours from Messrs. ——, who are perfectly aware that any deleterious compound would be injurious to us, if it made children ill (for our trade lies to a great extent amongst the youngsters); we, therefore, always impress upon them to let us have our colours as free from these noxious ingredients as possible.

"If you can suggest to Messrs. —— what to send us (that will answer our purpose), for we are only too anxious ourselves that the articles should not only please, but be beneficial to children's health, though, perhaps, not to their teeth. No one can have eaten many more of these goods than ourselves, and yet our health is in first-rate condition.

"We heartily wish the public would have all white goods, it would be a valuable boon to us, but we fear they will not.

"We are, Sir, yours respectfully,

"Mr. Robbins."

My remonstrance with the vendor may, I think, be considered satisfactory. So much can hardly be said with regard to the manufacturers, who it would appear are determined to supply a demand only maintained by the ignorance of the public.

January 30th, 1871. J. Robbins.

The Microscope and its Revelations.

Sir,—Referring to Dr. Carpenter's able lecture on the above subject, wherein he states, "If any of you are disposed to begin the study of the foraminifera, and will get the sponge merchants to give you the sand that they shake out of their sponges, when these *come over*, you will find an immense variety of foraminifera, which will give you plenty of occupation; and there is nothing more easy to begin upon than this sponge sand."

I beg to inform those readers of your Journal who are interested in this valuable and instructive study that I will give them as much sand as they desire on application, or will send by post on receipt of stamps to pay postage.

It is a matter of considerable pleasure to be able to assist in such a study. Fredk. Hovenden.

93 and 95, City Road, Finsbury Square, E.C.

York Chemists' Association.

Sir,—In reply to the inquiries of your correspondent "Excelsior," of January 28th, 1871, I may inform him that the York Chemists' Association is still in existence, with its President, Secretary and Treasurer and members. Amongst its members are some of the best and ablest Pharmaceutical Chemists of this city, who, from their experience and knowledge, are well able to superintend classes of Materia Medica Chemistry and Botany for the advancement of pharmaceutical education among the assistants and apprentices connected with the trade. It has been said we English live in an age of wind-bags and are all going away into wind and tongue. I am sorry to say that, in my opinion, the York Chemists' Association is no exception to this rule. Nearly two years ago the same question now asked respecting this Association was brought before the members, who, I believe, talked of doing something to advance the education of those under their charge, seeing that the examination had become compulsory; but it ended in talk, for the second winter has nearly gone by and nothing has been done as yet. Circulars were sent out convening a meeting of the Association a short time ago, at which the attendance of the members was particularly requested. Let us hope they are going to bestir themselves.

The York Chemists' Association might be made the means of doing a great amount of good among the young men connected with the trade. I believe they are not far behind other provincial towns in the knowledge they possess of their business, yet there is always something more to learn.

York, February 7th, 1871. An Assistant.

"*Senega*" (Nottingham).—Alkalies, or any substances containing caustic or carbonated alkalies, would be incompatible with chloral hydrate.

"*Dolore*" should apply to the Registrar.

J. W. Lasham.—We should not think you were liable to pay duty for a still which is kept for the purpose of show as you describe.

A. Plummer (Hereford).—We do not know of such a work.

"*Galen.*"—The formula has been recently printed in this Journal, 2nd Series, Vol. XI. p. 663.

A. P. S.—A description of the principal characteristics of the Natural Orders mentioned is required. There is no particular reference to the work mentioned by you.

H. H. Pollard (Ryde).—(1.) The Lectures on Fermentation are concluded. (2.) The name is not on the Register at the address stated.

A. P. S. (Swindon).—The question as it stands is too vague for the Notes and Queries column.

"*Amicus.*"—"*Croco,*" without the accent, is the correct form.

*** Owing to want of space we are unable to answer several inquiries.

The following journals have been received:—The 'British Medical Journal,' Feb. 18; the 'Medical Times and Gazette,' Feb. 18; the 'Lancet,' Feb. 18; the 'Medical Press and Circular,' Feb. 23; 'Nature,' Feb. 16; the 'Chemical News,' Feb. 17; 'Journal of the Society of Arts,' Feb. 16; 'Gardeners' Chronicle,' Feb. 18; the 'Grocer,' Feb. 18; the 'Chemists and Druggists' Advocate' for February; 'Produce Markets' Review,' Feb. 18; the 'English Mechanic,' Feb. 18; 'Philadelphia Medical and Surgical Reporter,' Nos. 719–724.

Communications, Letters, etc., have been received from Mr. E. B. Vizer, Mr. R. Bannister, Mr. Bothwell, Mr. T. H. Taylor, Mr. Mr. J. Finch, Mr. Wright, Mr. C. Cooke, Mr. R. Reynolds, Mr. Laxom, Mr. Carteighe, Mr. C. Ekin, Mr. Jones, Mr. R. Mumbray, Mr. E. Raynor, Mr. H. Hogg, Mr. S. Dean, Mr. T. Gregory, H. D., J. R. M., W. P., J. P., A. P., A. P. S., "Fairplay," "Chemist," "Podophyllin," "Beta," "American," "Forceps," "Medicina," "Lux."

CHLORAL HYDRATE AND CHLORAL ALCOHOLATE.

$C_2Cl_3HO, H_2O.—C_2Cl_3HO, C_2H_6O.$

BY DR. F. VERSMANN.

The sale and use of chloral hydrate has of late so largely increased, that it becomes necessary to be quite certain of the quality of the articles, and of the exactness of the method of testing it. In analysing a great many samples, from, I believe, almost every maker, I was naturally led to inquire into the physical properties of the hydrate, and also of the chloral alcoholate which may possibly be met with in the market as a substitute for the former.

Dr. Paul, in his article in this Journal of 4th ult., has drawn attention to the difference in the crystalline forms in which the hydrate is sold; this is, no doubt, owing to the different solvents employed for recrystallization. Thus, a concentrated aqueous solution, placed under the air-pump, gives rhomboid crystals, ether gives small hard crystals, acetone fine needles, warm benzole supersaturated deposits on cooling also fine needles; whereas a solution in benzole, allowed gradually to evaporate, deposits large crystals sometimes ½ in. long. Bisulphide of carbon in same manner yields either fine needles or large crystals. A saturated alcoholic solution gives beautiful long feathery crystals. I obtained some 1½ in. long, which have all the appearance of the alcoholate, and which were found to be so. This is remarkable, and may possibly account for the fact of one sample, obtained as hydrate, being pure alcoholate, as the manufacturer may have recrystallized the impure hydrate from alcohol without being aware of the change produced.

The hydrate is extremely hygroscopic, the more so the smaller the crystals are. 10 grains of fine needles left in an open vessel became quite fluid in a day, whereas the same quantity of hard crystals became only opaque, and again transparent the following day. But in both forms the compound is so volatile at ordinary temperature, that the first had completely evaporated after five days, carrying away with it the moisture absorbed, and the last in eight days.

The hydrate is extremely soluble in water, 100 parts of water dissolve as much as 360 parts of dry crystals; the alcoholate is also soluble in water, but to a much smaller extent, and much slower.

In fact, the two may be readily distinguished in the following manner:—Take a pretty wide beaker-glass, 6 or 8 in. high, full of water, drop a few crystals into it: the hydrate sinks down at once, and is almost dissolved before it reaches the bottom. With the alcoholate the larger crystals only will sink to the bottom, and lie there for several minutes before they gradually and very slowly disappear; but small crystals or fragments of crystals will float on the surface of the water, and as soon as they are attacked by the water, the slight current of the saline solution sinking down occasions sufficient disturbance to apparently impart life to the solid particles, —they begin to spin round and round, and dart from one side of the beaker to the other, until the very last solid particle has disappeared. This is not only a very pretty and amusing sight, but it is really a distinctive mark between the hydrate and the alcoholate. Slightly tepid water makes the action even more violent.

The specific gravities of solutions in water of the two compounds also show a great difference, as will be seen by the following figures:—

Temp. 15·5° C. (60° F.)	Hydrate.	Alcoholate.
20 per cent. solution . . .	1085	1072
15 ,, ,, . . .	1062	1050
10 ,, ,, . . .	1040	1028
5 ,, ,, . . .	1019	1007

The specific gravity of the two substances in the liquid state is another criterion, that of the hydrate being 1610 at 49° C. (120° F.), and of the alcoholate 1143 at 40° C. (104° F.)

I do not attach any value to the boiling-point as a test for purity, and for this reason. Both hydrate and alcoholate at that temperature begin to decompose into chloral and water or alcohol respectively, and it is sometimes extremely difficult to take correct observations. I have had undoubtedly good samples of hydrate commencing to boil only above 100° C., and of alcoholate commencing to boil at 80° C.

So far I have treated the two substances separately, but if the alcoholate really should be introduced as an adulterant, the direct proof of alcohol will become necessary. For this purpose Lieben's method is the best, who converts the alcohol into iodoform, and detects minute quantities.

All the samples I have hitherto had occasion to test were true chloral hydrate, with the exception of one; but they varied very much in the percentage of moisture, and for this reason it is necessary to have a ready and accurate method of determining the percentage of true hydrate in a sample.

We now know only the ammonia test. This method, if properly carried out, is sufficiently exact to decide between hydrate and alcoholate, where the percentage of the resulting chloroform differs as much as 72·2 and 61·76; but it cannot claim analytical accuracy.

The column of ammonium formiate solution always takes up some chloroform, and the chloroform layer is never free from water; chloroform is dissolved while it separates from the ammonia, and its true percentage invariably decreases.

It has also been suggested that during the twelve hours contact of the ammonia and chloroform, the last might be further decomposed into hydrochloric and formic acid; but this I find not to be the case. Experiments made with chloroform and ammonia and with chloroform and pure water gave in both cases a loss of chloroform amounting to 0·2 c. c., the same well-stoppered tubes being used as in the analysis of hydrate, of which always 10 grammes were taken. It is evident, therefore, the decrease in chloroform is not owing to the action of ammonia, but to its solubility in water.

This and the length of time required for the ammonia test are certain drawbacks; and I have tried another plan, which is both more accurate and more expeditious.

I take advantage of the facility with which the chloral hydrate and the chloral alcoholate are decomposed by strong sulphuric acid with separation of chloral, which, in a graduated tube, may be read off and the percentage of hydrate calculated.

I take about equal parts by weight, *i. e.* 10 grammes of the hydrate and from 5 to 6 c. c. of sulphuric acid; the quantity of the acid is of no consequence within certain limits; 5 parts of hydrate and one part of acid do not separate chloral, even when heated. And again, a great excess of acid, such as 5 parts of acid and 1 part of hydrate, does not give a satisfactory result; neither the chloral nor the acid becomes clear, perhaps because of the formation of chloralide.

But as the result of a series of experiments, I find that about equal proportions by weight act very satisfactorily. The acid after combination with the water of the hydrate and the resulting chloral are not so widely different in their specific gravities as to immediately separate; I, therefore, prefer to warm the mixture to expedite the separation.

In a graduated tube provided with a well-ground glass stopper and graduated into 0·1 c. c., I introduce from 5 to 6 c. c. of sulphuric acid, and heat it by placing the tube into a vessel of water of about 60° C. (140° F.); I then add 10 grammes of chloral hydrate, shake well, so as to cover all the hydrate with the acid, and put the tube back into the hot water. The decomposition is instantaneous, and the two liquids separate very distinctly; the chloral floating at the top may be read off as soon as the tube has cooled down to the proper temperature. After an hour or so the two liquids begin to mix again, and in about twelve hours the chloral is changed into metachloral, a substance of exactly the same chemical composition as chloral, but solid and absolutely insoluble in water and alcohol.

I find the previous heating of the acid most convenient, because, just as in the combination of chloral and water very considerable heat is evolved, so in the taking away of the water by sulphuric acid an immense amount of heat is absorbed, and the cold produced is so considerable as to seriously interfere with the separation of the chloral. Determinations with numerous samples, both with the ammonia test and the sulphuric acid test, always gave a somewhat higher result with the last, which is more correct.

For this reason, and also because the whole operation may be completed in a few minutes, I prefer it to the ammonia test. In a subsequent paper I intend publishing the corresponding results of the two methods.

THE DEVELOPMENT OF ERGOT.

BY M. C. COOKE, M.A.

There is probably no article in the whole range of Materia Medica, concerning which more has been written than ergot. This is a very rough guess, and would exclude even the cinchonas from the first place, so that the guess may hardly stand the test. At any rate, a great deal has been written about ergot, much of which is now forgotten. A curious and startling catalogue might be compiled of the titles of books, memoirs and communications on this almost threadbare topic. Yet, in the face of this, we are seated, in a deliberate mood, to add another chapter to the long story of ergot. This chapter is intended to be devoted wholly to one phase of the subject, which is, the "natural history," or plant-development of the fungus.

We will say nothing of the difference of opinion as to the ergot itself being a transformation of the germen, or a parasite of the germen, but start at once with the *Secale cornutum*, as the first stage. In this condition it is called by botanists a *sclerotium*, and this particular one is *Sclerotium clavus*. What is to be understood by a *Sclerotium?* is a very natural question to suggest itself. It will not do to pass it as a generic name, since it has no value as a genus, and even were it not so, the answer would be insufficient. Fungi are known to be developed in the majority of instances, from certain root-like filaments called mycelia. Sometimes these filaments are very much compacted, and in the present, and some allied instances, assume the form of a compact cellular mass called a sclerotium. So that a sclerotium is, in fact, a compact mycelium, a sort of bulbous mycelium, of variable shape. Such is ergot. Whether produced on wheat, rye or the grasses, this sclerotium differs very little in form, being horn-shaped, whilst other kinds of sclerotium are spherical, discoid or irregular.

The earliest condition of this species is manifested by the presence of a thick gummy matter on the spikes of corn or grass, and this contains granules. During the growth of the sclerotium it is invested by a coating described in detail by Professor Quekett, in a memoir devoted by him to this subject. What the relation is between the gummy matter and the sclerotium and its coating is uncertain, unless it be accepted that the sclerotium is developed ultimately from the base of a spermogone, which, in the first instance, exuded spermatia in the aforesaid gummy mass. The coating was considered a distinct fungus, parasitic on the ergot, by Quekett, and called by him *Ergotetia abortifaciens*, whilst Berkeley retained it in *Oidium*, with the same specific name. It is now regarded as the spermatiferous condition of the complete fungus. Quekett described this coating as consisting of minute bodies, which are seen, separated from each other, when they are removed from the ergot, but when viewed in their natural situation they are occasionally united by their extremities forming short moniliform filaments, technically "Sporidia (spermatia) elliptical, moniliform, finally separating, transparent, and containing seldom more than one, two, or three well-defined (greenish) granules."*

Another view taken of the relations of the sclerotium with other fungi is, that the species of *Fusarium*, described by Nees, under the name of *Fusarium heterosporium*, produces, in its supposed spindle-shaped spores, the *spermatia*, and that the simple bodies produced on the sclerotium (the *Ergotetia* of Quekett, and *Oidium* of Berkeley) are the conidia of the fungus ultimately developed from the ergot. Never having had the opportunity of watching the growth of the ergot carefully, we shall not venture an opinion on the identity of all the bodies supposed to be connected with the reproduction of this species, and called by numerous names.

The ultimate stage consists in the growth of little stalked bodies with rounded heads from and upon the sclerotium. If ergot of rye, wheat, etc., be slightly covered with soil in spring (March or April), and kept moderately moist with rain water, in the course of time a crop of these stalked bodies will be produced, but patience is quite necessary, for six months may be required for their growth. These are the *Cordyceps purpurea*, or *Claviceps purpurea*, by which name the whole of the forms of this polymorphous fungus should be called. Hence we have the stroma, or compact mycelium (sclerotium), conidia, spermatia,

* E. J. Quekett, "On Ergot of Rye," etc. Linn. Trans. vol. xviii. p. 453.

and finally the ascophores containing the sporidia, and all appertaining to *Claviceps purpurea*, Tulasne.

The ascophores, or stalked bodies with globose purplish heads, are minute and delicate, several of them being often produced upon the same sclerotium. The globose head is the fruit-bearing portion. Numerous cells, with distinct walls (perithecia) are immersed in the substance of the head. Each of these cells contains a mass of long, narrow, cylindrical, transparent sacs termed asci, which are thickened at their apices. Each ascus enclosed eight hair-like sporidia, flexuous and delicate, slightly attenuated towards each end. This is the final and highest development which the fungus attains. A closely allied species is found on the sclerotium of reeds, and another on the sclerotium of *Eleocharis*,—the latter, as far as we are aware, never having been found, except as a sclerotium, in Britain.

This is a brief and rapid survey of the stages in the history of ergot. It would be an interesting and probably instructive experiment, for those who are only acquainted with *Secale cornutum* as one of the articles of materia medica, just to follow the plan we have indicated, and try the cultivation of the sclerotium. It is possible that the examination of the fresh condition of the *Claviceps*, under the microscope, may reveal a phase of vegetable life before unknown to them. Even as a mere curiosity, and nothing more, the labour is but little that is required to grow the ergot-fungus, and, should this be successful, an effort might be made to develope the kindred species from the ergot which is so common on *Eleocharis*,—the success of the latter effort would add a third species of *Claviceps* to the British list, and this would be some reward for the trouble expended.

THE TESTS FOR CHLORAL HYDRATE.

BY C. H. WOOD, F.C.S.

Having had occasion during the last few months to examine a number of samples of chloral hydrate, I have made a great many trials of the ammonia test described by Mr. Umney. This method possesses the apparent advantage of simplicity; but, to ensure accuracy, several precautions which are somewhat tedious, must be carefully observed. Dr. Paul, in the paper recently published by him, has shown that, unless the mixture be warmed for a considerable time and frequently shaken, a result either too high or too low may be obtained. That exactly confirms my own experience. Moreover, the large quantity of material required for each operation, and the length of time (about 12 hours) which must elapse before the results are obtained, constitute considerable inconveniences. I have therefore had recourse to another method for determining the yield of chloroform, which appears to me to possess several advantages. A hundred grains of the chloral hydrate to be tested are introduced into a 4-oz. flask and dissolved in an ounce of water. Thirty grains of dry hydrate of lime are then added, and a cork, furnished with a long piece of glass tube, is fitted to the mouth of the flask. This tube is bent over just above the cork, so as to slant down and form a condenser. It is surrounded with wet blotting-paper during the experiment. The extremity of the tube is somewhat drawn out, so as to enter a graduated tube, which serves as a receiver. A gentle heat is then applied to the flask and the chloroform slowly distilled over. After a few minutes the heat is increased, so as to keep the mixture boiling, and continued until about 100 grain measures have been collected in the receiver. By this means the steam thoroughly displaces and sweeps over the last traces of chloroform. It is only necessary to read off the volume of the chloroform obtained. Before taking the final reading, it is advisable to keep the tube in a vessel of water exactly at 60° F. A few drops of liq. potassæ poured into the tube destroys the meniscus of the chloroform, and enables the operator to read off very accurately. The whole process does not occupy a quarter of an hour; and, as far as my experience goes, the results obtained are very trustworthy. If a larger quantity of lime be employed than the amount indicated, some inconvenience is experienced from the frothing of the mixture, but this is easily avoided. Milk of lime appears to exercise no sensible action on chloroform. I have made several experiments in which known volumes of chloroform have been taken in the place of the chloral hydrate, and in every case I have obtained the proper amount back within about a single grain measure. The tube which I employ as a receiver was carefully graduated for the purpose. It is about ten inches long and a quarter of an inch in internal diameter. It was graduated by introducing a few drops of liq. potassæ, and then running in pure chloroform at 60° from an accurate burette, marking the tube with a file after every addition of ten grains measurement. Five such marks are all that is required. The space between the fourth and fifth mark may be easily divided afterwards into ten equal parts.

For the recognition of alcoholate in chloral hydrate I have always employed Lieben's test for alcohol, which answers the purpose easily and satisfactorily. It is best applied to the aqueous portion of the distillate accompanying the chloroform. If this supernatant layer be decanted into a test tube and warmed with 2 or 3 grains of iodine and a slight excess of liq. potassæ, a crystalline precipitate of iodoform will gradually form when only minute traces of spirit be present.

As far as my experience goes, the alcoholate is not, if it ever has been, an article of commerce.

For several reasons it is desirable to take the yield of chloroform as a criterion of the quality of chloral; nevertheless it does not appear to me necessary to resort to this quantitative reaction in the ordinary examination of trade samples.

The following simple tests, which are quickly and easily performed, constitute a sufficient guarantee of the purity of commercial chloral hydrate:—

1. A small portion heated on platinum foil should entirely volatilize without leaving any visible residue.

2. Twenty grains dissolved in a drachm of distilled water should form a perfectly bright and clear liquid. A drop of nitrate of silver solution added should produce no turbidity.

3. A drachm introduced into a test-tube furnished with a cork, through which passes a thermometer and

a small outlet tube, should boil, on the application of heat, without the temperature rising above 212°F.

The boiling-point is a very important character of chloral hydrate, and should never be neglected, even when the chloroform test is also employed. It will at once distinguish between the hydrate and alcoholate. Moreover, some samples of hydrate, in which no alcohol can be detected, nevertheless boil at too high a temperature. This is probably due to the presence of some chlorine substitution-products other than chloral. A recent editorial article in this Journal ascribes the low yield of chloroform sometimes obtained, to the moist condition of the samples. No doubt a slight excess of water is frequently present, and forms a very unobjectionable constituent. But while an excess of moisture would diminish the percentage of chloroform, it would not raise the boiling-point above 212° F. It is on this account that I regard the boiling-point as being in some respects a better and simpler test for ordinary use than determining the chloroform.

SPIRITUS AMMONIÆ AROMATICUS, ITS PREPARATION AND COMPOSITION.

BY WILLIAM MARTINDALE, F.C.S.

The attention of the trade having been called to this preparation by a medical contemporary, in an article in which it complains that samples purchased at several chemists, were notably deficient in ammonia and spirit,—by way of testing the correctness of its results, I have been led to perform the following experiments :—

(1.) Having powdered 8 oz. of carbonate of ammonia, dissolve it in 16 oz. of water by means of 4 fluid ounces of strong solution of ammonia, sp. gr. 0·891. This will form a clear solution, but on the addition of 6 pints of rectified spirit, and the essential oils, such a precipitation takes place of ammonia salts that it forms a complete magma of the whole fluid. The product of the Pharmacopœia process would resemble this, if it contained all the ammonia, carbonic acid and spirit ordered to be used. (2.) Let the experiment be repeated, using 2 pints of water in place of 16 oz., making a solution of the carbonate in the water and strong solution of ammonia, as before, first. It will now be found, that on the addition of the spirit, a bright and clear mixture is formed; but when the fluid has been allowed to stand, a quantity of minute acicular prisms, crystals of normal ammonium carbonate (?), will have deposited. And again (3), let the Pharmacopœia quantities be taken, *i.e.* the same as above, but using 3 pints of water. Having dissolved the essential oils in the spirit previous to the addition of the solution of ammonia salts, it will be found that a milky, opaque mixture is formed, due to the separation of the oils,—the spirit not being then strong enough to hold them in solution,—but there will be no crystalline deposit at ordinary temperatures. On proceeding to distil the mixture, in the first portion of the distillate there is always a more or less quantity of crystalline formation noticed in the receiver, but that, as the process is continued, is redissolved. Having obtained the required quantity,—7 pints of distillate,—upon examination of what remains in the still, upwards of two pints of fluid, that will still be found to contain a quantity of ammonia, in fact, an equal volume of it will be found to contain about one-third as much as there is in the distillate. And if, especially on a large scale, the process be not carefully conducted, this liquid, on cooling, may sometimes contain a quantity of mixed salts of ammonia, not held in solution. It is, in fact, found to be impossible to have the distillate to contain more than about 1·7 per cent. of ammonia without its being deficient in carbonic acid. To quote Dr. Divers*:—"By following the directions in the British Pharmacopœia to use, solution of ammonia and commercial carbonate instead of pearlash and sal-ammoniac, the formation of a spirit containing excess of ammonia is favoured, but to only a small extent. The spirit thus obtained is, of course, equally liable, if too strong in alcohol, to decompose into a basic solution and half-acid or acid carbonate, as I ascertained by preparing it." He previously states that it not unfrequently proves to contain much less carbonate than it is intended to contain.

TEST FOR ARSENIC.

A new and very delicate test for arsenic has been discovered by Bettendorff. Its sensibility is so great, that it is said to be capable of detecting one part of arsenic in a million parts of solution, and the presence of antimony does not affect it. In order to apply this test, the arsenious or arsenic liquid is mixed with hydrochloric acid until fumes are apparent; thereupon stannous chloride is added, which produces a basic precipitate, containing the greater part of the arsenic as metal, mixed with stannic oxide.

ARTIFICIAL INDIA-RUBBER.

Prof. Sonnenschein has discovered that an elastic mass resembling caoutchouc may be obtained by combining tungstate of soda with certain organic substances. If tungstic acid or tungstate of soda be added to glue, and afterward muriatic acid, a compound of tungstic acid glue is precipitated which is so elastic at 85–105° F., that it can be drawn out into very thin fibres. On cooling, the mass becomes very solid and brittle. It is proposed to employ this substance in place of the costly albumen for mordanting cotton, especially for aniline colours.

The same material has been used in tanning leather; but this became hard as stone, and consequently unsuitable for ordinary purposes. By adding tungstate of soda and muriatic acid to a solution of gelatine, and heating the precipitate, a substance is obtained which may be used as a putty or cement in many cases.—*Manufacturer's Review.*

USE OF THEINE AS A THERAPEUTIC AGENT.

BY LEWIS THOMPSON, M.R.C.S.

I wish to direct the attention of the medical profession to the use of a valuable agent which has hitherto escaped notice, although its powers are most unquestionable, and its cost price very trivial. The article to which I allude is theine, a substance existing in tea and coffee, and, as I believe, in many other vegetable products. As a medicine, theine is powerfully tonic and stimulant, and appears to possess the tonic virtues of the disulphate of quinia united to the stimulating power of wine, but with this difference, that the stimulus from theine is not followed by depression, as in the case of wine and alcohol.

Theine seems to act chiefly on the great sympathetic

* Divers on the Combinations of Carbonic Anhydride with Ammonia and Water.

or ganglionic system of nerves, and but slightly on the brain. I have used it in doses of from 1 to 5 grains, with very marked advantage in the low stage of typhoid fevers, confluent small-pox, and that form of mortification of the toes which is so singularly fatal to old people. But, in addition to this, different medical friends of mine have found it useful in hemicrania, neuralgia, and what has been called relapsing fever; and in the case of an overdose of opium, it appeared to relieve the narcotic symptoms speedily. With regard to the cost of this medicine, I have discovered that in the ordinary process of roasting coffee the whole of the theine is driven off before the torrification of the coffee is completed, and this theine may be cheaply collected by making the axis of the coffee-roaster tubular. If, instead of a solid axis, we employ at one end of the roaster a tube passing away to the distance of about three feet, the theine is condensed in this tube by the refrigerating power of the atmosphere, and may afterwards be easily dissolved out by a little water, and purified in the manner about to be indicated. As the result of much experience, I have obtained, on an average, 75 grains of theine from the roasting of one pound of raw coffee; and when we reflect that in Great Britain alone there are more than 13,000 tons of coffee roasted annually, we see that about 140 tons of theine are wasted and lost every year by sheer ignorance. It may, perhaps, be thought that the saving of the theine will damage the flavour of the coffee, but from experience I know that it has no such effect; and, in point of fact, it is an advantage to the flavour of the coffee to make both the axes of the roaster tubular, and to cause a gentle current of air to pass through the apparatus during the roasting of the coffee, so as to expel the empyreumatic products as they are formed. I will now relate the fact upon which the purification of theine depends; and when this is once clearly understood, the manufacture of theine from either tea or coffee becomes an extremely simple matter. Theine is absolutely insoluble in a concentrated solution of the carbonate of potash, and thus we may precipitate it from its admixture with sugar, mucilage and vegetable extract. If, then, by means of the subacetate of lead, we have removed from a vegetable infusion the tannin, malic acid, etc., we have only to evaporate the filtered solution to a small bulk, and add to it its own weight of dry carbonate of potash, and the whole of the theine becomes at once insoluble; so that, having collected this insoluble product, and boiled it in rectified spirit of wine, we have a solution of pure theine, which, after distilling off the spirit, furnishes crystals fit for immediate use. In conclusion, I will merely mention a distinctive test for theine, sufficiently delicate to detect the one-thousandth of a grain of that substance. Dissolve the theine in a small quantity of water, and pass through this a stream of euchlorine, then allow the fluid to evaporate at a steam heat; a blood-coloured substance will remain, which, on the application of a few drops of cold water, forms a beautiful scarlet solution like red ink. It is, I apprehend, almost unnecessary for me to say that euchlorine gas is formed by the action of hydrochloric acid upon the chlorate of potash.

I ought, perhaps, to add that theine, collected as a waste product from coffee, and purified by myself, has cost me less than threepence per ounce troy.—*Medical Times and Gazette.*

AMERICAN DRUGS.

BY C. LEWIS DIEHL.

To write an article upon a subject that has not been completely investigated is, perhaps, the most unsatisfactory task imaginable, and this appears to be allotted to me in the present paper. When I accepted query 23, for 1868, I had no idea of the difficulties to be encountered in its proper solution. Apart from those of a purely personal character, I have met with the greatest difficulties in obtaining answers to inquiries from parties who could, if inclined, have given the desired information. Yet some little information has been obtained, which, however meagre, I propose to give in the following.

My sources of information are various. In some few instances I have received responses from those directly or indirectly engaged in the collection of indigenous drugs; but generally I have been obliged to depend upon that obtainable from wholesale dealers, to whom consignments had been made by parties doing business with them.

It is a remarkable fact that our Louisville wholesale druggists depend upon the New York markets for their supplies of indigenous drugs, many of which abound and frequently are collected in our immediate neighbourhood. Our retail dealers are supplied with limited quantities by several gatherers living among the range of hills in the neighbourhood of New Albany, Ind., known as "the Knobs." Formerly there was a lively trade in indigenous drugs in New Albany; but such is not now the case, and the drugs gathered in its neighbourhood find their markets no further than our city. Our immediate neighbourhood, on the Kentucky side, also contributes to our supplies through a few small gatherers, chiefly Germans; but taken altogether, our home supplies far from meet the demand of our retail trade, and generally bring better prices than those obtained from a distance.

The drugs principally collected in our neighbourhood —of which the largest part among the Knobs near New Albany—are: *Podophyllum*, *Leptandra*, *Caulophyllum*, *Lobelia*, *Cimicifuga*, *Gelsemium*, *Ulmus*, *Stillingia*, *Xanthoxylum*, *Phytolacca*, *Asarum canadensis*, *Cornus florida*, *Panax*, *Aralia nudicaulis*, *Aralia racemosa*, *Sambucus*, *Cataria*, *Mentha piperita*, *Hedeoma*, etc., and limited quantities of *Serpentaria*, *Spigelia* and *Senega*. These abound also, and are collected, in the counties of Shelby, Monroe, Brown and Morgan; and one of our principal establishments has lately negotiated for a full line of indigenous drugs from Pembroke, Kentucky.

My information seems to indicate that the mountainous regions of Kentucky, especially Eastern Kentucky, contribute largely to the supplies of our Western dealers in indigenous drugs. From East Tennessee and Western Georgia large quantities may be, and undoubtedly are, obtained. Several years ago I had offers from a party in Chattanooga of quite a line of indigenous drugs. Where they find their market I am unable to say, but incline to the belief that the principal collections reach New York by way of Savannah, Ga. In many of the Southern States this branch of trade appears to attract considerable attention since the war, mainly in mountainous and swampy sections. In the neighbourhood of Walhalla, South Carolina, quite a brisk industry has sprung up, and large shipments are made from there to New York, through the agency of Charleston firms. The drugs collected there may be enumerated in the following:—

Panax, *Senega*, *Cypripedium*, *Liatris spicata*, *Spigelia*, *Sanguinaria*, *Aralia nudicaulis*, *Aralia racemosa*, *Asclepias syriaca*, *Asclepias tuberosa*, *Rumex*, *Podophyllum*, *Hepatica*, *Rhus*, *Rubus villosus*, *Cimicifuga*, *Marrubium*, *Stillingia*, *Spiræa ulmaria*, *Aletris*, *Convallaria Polygonatum*, *Tussilago Farfara*, *Phytolaeca*, *Ulmus*, *Goodyera pubescens*, *Frasera carolinensis*, *Arum*, *Solidago odora*, etc.

Occasionally consignments of *Senega*, *Serpentaria* and *Spigelia* reach our markets from Arkansas direct. Several years ago I purchased several bales of *Senega* and *Spigelia*, consigned to one of our wholesale houses from Ozark, Arkansas. It proved to be a poor investment, as the interior of the bales consisted largely of stems, and had to be garbled. The drug-gatherers of the Southern States being generally small farmers and negroes, make no regular profession of it, and only collect as their time permits; hence the difference in the yield of these drugs between one year and another. They are disposed of by them to the nearest country storekeeper, who on his part consigns them to the wholesale dealer with whom he may happen to do business. I am told by reliable informants that the drugs collected in the Red River districts seldom reach our markets except by way of New Orleans and New York, and that when they do reach us direct, they are generally inferior in quality. One of our principal wholesale drug-houses buys its supplies of indigenous drugs exclusively from a New York firm, and nearly all of the others depend upon the same firm when they cannot obtain bargains nearer home. When first making inquiries regarding the collection of indigenous drugs, I met with the invariable response, "*Inquire in New York.*"

Regarding the method of collecting and preparing the drugs for market, I can give you but little direct information. I have before me a circular addressed to drug-gatherers by one of our principal Western dealers in indigenous drugs, from which I extract the following:—

"Most medicinal roots are perennial (that is, the roots continue more than two years, whether the leaves continue or not), and should be gathered any time between maturity or decay of the leaves or flowers, in the summer or fall, and the vegetating of the succeeding spring. Biennial roots, or those that live but two years (like burdock and yellow dock), should be collected of the growth of one year,—any time between September and the time they commence running up to seed in the following spring.

"Barks should be gathered as soon after they will peel in the spring as possible and all the moss carefully removed. It is usually best to fell the tree and remove the moss while the bark is on the tree.

"Leaves and herbs should be collected just before they mature and before they begin to fade; the stems and stalks rejected, as when dry they are a hard, woody substance, nearly inert.

"Flowers when they first open; and

"Seeds just before they are quite ripe, as they, like leaves and flowers, ripen after being gathered.

"Roots should be thoroughly cleansed from dirt and foreign substances, and if large, like Indian turnip, etc., sliced.

"All the above articles should be dried; the sooner the better. For the first few days it is best to expose them to the sun and air, avoiding any dew or dampness; then spread around on floor and shelves, watching them to see that they do not heat by being piled too thick, till nearly dry. Most roots require from three to six weeks to dry sufficiently to be safe.

"For shipping, it is best to pack them hard in coffee-sacks or large gunnies and burlaps; the next best is good flour-barrels."

These circulars appear to be distributed with great circumspection among herb-gatherers and country stores throughout the Southern and Western States, and in all probability serve as a guide to the gatherers. The few gatherers with whom I have been able to converse personally, proved very slow to give information, but from their conversation I judge that they preserve their collections on the general principles above specified.

It is a matter of sincere regret with me that I have been unable to do more than the foregoing towards the solution of this question; but I feel sufficient interest in it not to let the matter rest where it now stands, and shall do all in my power to give a better answer at the next meeting of the Association.—*Proceedings of the American Pharmaceutical Association*, 1870.

Cure for Corns.—A slice of lemon, secured by a strip of cloth to the part affected, will generally have a beneficial effect.—*New York Druggists' Circular.*

BHANG- AND OPIUM-EATING IN INDIA.*

The saying that every race finds out for itself some stimulant—alcohol for Northern Europe, coffee for Arabia, bhang for India, opium for China—is trite enough and, on the whole, true enough. In India, where the common hemp plant (*Cannabis sativa*) grows freely and acquires properties unknown here, its use as a stimulant and narcotic is of high antiquity. It is prepared in various modes, and is swallowed or smoked—as churrus (the concrete resinous juice of the plant), as gunjah (the dried plant retaining its resinous juice) and as bhang (the larger leaves and capsules without the stalks). So different are the effects of these from those produced by the home-grown plant, that it has been customary to speak of the Indian variety as *Cannabis indica*, as if the species were different; but it is not so. The name "bhang" is also given to a narcotic liquor prepared from the hemp, which in this form is largely consumed. From it is prepared a sweetmeat called *majoom*, which also contains ghee and sugar. The bhang-drinking is had recourse to because alcoholic beverages are forbidden by both the Hindu and Mohammedan religions, and gunjah-smoking is used for a like purpose. Gunjah is never smoked alone, but is kneaded with tobacco in the palm of the hand, and when lighted in the pipe the smoke is inhaled in long whiffs. As usual, under such circumstances, a speedy renewal of the dose is necessary to prevent subsequent depression, and so the hemp-eater, like the opium-eater, soon becomes confirmed in the use, or rather the abuse, of the drug. Whilst it lasts, the intoxication produced by hemp is of a pleasant kind—a feeling of lightness and as if the spirit was no longer connected with the dull body, is common. It was the drug employed by the Old Man of the Mountains to give his followers a foretaste of Paradise, and thus secure their infallible obedience. As his orders usually were for the murder of some offender in cool blood, his followers, in course of time, acquired the name of Haschischi, modified into our modern word assassins.

The effect of the drug on the constitution is marked, but not so great as that of opium. The gunjah-smoker is dry and rickety in his appearance, his eyes sunken, his cheeks flattened, and of a generally faded look. These effects are in a great measure obviated or, at least, mitigated by the use of a diet containing an abundance of fat; but a hemp-eater or smoker is never stout. Dr. Chevers tells us that in practice he has found that an opium-smoker, when sick, must have his dose, or he dies, but that the gunjah-smoker may have his drug cut off with impunity, except in cases where every means of alleviating pain is necessary. In connection with this subject, it may be interesting to note that long ago this substance, in the form of majoom, was used as a kind of anæsthetic, especially in making eunuchs and in circumcision.

One would have expected that, in a country like India, the intoxication produced by the drug would frequently have been seized upon by the criminal classes for the purpose of robbery; but this does not seem to be often the case, although in a former article we pointed out that the drug was occasionally mixed with datura for that purpose. As a result of the prolonged and continuous use of the drug, complete loss of speech is sometimes noted, but is not very common. Much more frequent, as a result of the practice, is the insane condition in which the individual is prompted to acts of savage violence. A few days' quiet generally ends in restoring the mental

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* 'A Manual of Medical Jurisprudence for India, including the Outline of a History of Crime against the Person in India.' By Norman Chevers, M.D., Surgeon-Major H.M. Bengal Army, Principal of the Calcutta Medical College, Professor of Medicine and Senior Physician in the College Hospital, etc. Calcutta: Thacker, Spink and Co. Pp. 861.

faculties, but many become permanently insane. It is in the intoxication produced by hemp that running a-muck seems most frequent,—not that it follows that hemp is the cause of the violence, but the native, excited by some wrong, real or imaginary, fortifies his determination to be revenged by a dose of gunjah or bhang.

Opium eating and smoking are very prevalent in many parts of India; but the drug does not seem to be very often used as a poison, except in those parts where it is produced in abundance. But it would seem to have been very extensively employed for the destruction of female children. To this end, it was either introduced into the infant's mouth or the mother's nipples were anointed with it; so that it was insensibly taken in with the milk. Drugging older children, by their nurses, to keep them quiet, is common enough, and opium is used for this purpose also. Opium-eating seems to be most prevalent among the Rajpoots; with them, eating opium together is the most sacred pledge of friendship; and upon festivals and high days the chiefs solemnly partake of it in company. The practice was encouraged, because opium was supposed to strengthen their courage in warfare, and to increase their aptitude for business. Finally, it would seem that in certain parts nux vomica is eaten to the extent of as much as twenty grains a day, in the same way as opium, and the hakeems give it to supersede the use of opium.—*Medical Times and Gazette.*

ADULTERATION OF "GOLDEN SYRUP."

A paragraph having gone the rounds of the American papers stating that the substance retailed as golden syrup contains no sugar at all, but that it is produced by the action of strong sulphuric acid upon starch, and mentioning tannic acid as a test to show the difference between it and cane-sugar, Dr. C. E. Chandler has published the following remarks upon the subject in the *American Chemist*:—

Genuine "golden syrup" is the liquor drained from the crystallized sugar of the sugar-house, after all the sugar that can be profitably extracted from raw sugar has been separated. This syrup still contains a considerable quantity of crystallizable sugar, which cannot be profitably extracted, together with uncrystallizable sugar, colouring matter, and the substances which give to syrup its peculiar agreeable flavour, but whose exact nature is not known.

The adulteration complained of is the dilution of this pure sugar-house syrup with syrup made from starch, or the entire substitution of starch syrup for sugar-house syrup. We have no fault to find with this portion of the statement, but the test with tannic acid or strong tea is totally fallacious. It is simply a test for iron, which is much more likely to occur in genuine sugar-house syrup than in the starch syrup complained of. The raw sugar is manufactured in iron vessels; the tanks, pipes, coal-filters, moulds, and often the vacuum-pans in the sugar-house are made of iron, and as the solutions take up small portions of this metal, the syrup often, though not always, contains iron. The refiner is careful to prevent, as far as possible, the introduction of iron into the sugars and syrups, not because it is in any way injurious, but simply because if it occurs in the sugar to any extent, it produces a dark colour when used in tea, which consumers dislike. As syrup is not used in tea, there is no real objection to a small proportion of iron; in fact, as iron is a good tonic, its presence is perhaps desirable. The starch-sugar which we have seen manufactured on a large scale in Europe, would not be as likely to contain iron. This test, therefore, is simply a test for iron, and not a test for adulterated syrup; in fact, guided by this false test, one would be likely to reject pure sugar-house syrup, and select the starch syrup instead.

SYRUPUS CROCI.

Mr. G. W. Kennedy, of Pottsville, Pennsylvania, having been called upon to make considerable quantities of syrup of saffron, gives in the *American Journal of Pharmacy*, as the result of his experience, a formula which, in his opinion, yields a very fine preparation. He says, "As commonly prepared, it is apt to ferment, and become worthless; during the summer months I have found it to ferment with ease. This is entirely obviated by substituting glycerin for sugar. I have some in my store which I made eight months ago, and it is as perfect as when first made. It is known that the medical properties of saffron are due to the volatile oil; and in order to obtain this we must guard against heat in the preparation of the syrup, and make it cold, as when heat is used it drives off part of the volatile oil. The next point is to use something that will dissolve the volatile oil from the saffron, and for that purpose I have used glycerin, and find it to work admirably.

"Take of true Saffron ℥ss
Glycerin ℥ij
Water ℥vj.

"Let the above macerate for seven days, filter into a pint bottle and add water through the filter q. s. to make ℥viij, then add sugar 14 oz. av. and dissolve cold by frequent agitation. The result is a beautiful thick, dark orange-coloured syrup."

SPURIOUS QUININE.

In the last number of the *American Journal of Pharmacy*, Mr. Charles Bullock, of Philadelphia, announced the discovery of an intended fraud in the vending of a spurious preparation. He says that there has lately been offered in the market there what purported to be about five thousand ounces of sulphate of quinine of the manufacture of Pelletier, Delondre et Levaillant, of Paris. The bottles in which it was contained bore the label and the corks the seal of that firm.

An examination of the so-called sulphate of quinine, which was offered at about the market price of quinine, showed that it contained scarcely a trace of quinine, but consisted entirely of muriate of cinchonine mixed with small quantities of the other associated alkaloids of the bark.

The first impression was that old bottles from which the labels had not been removed had been used to perpetrate the fraud; but a more careful examination and comparison with a known genuine package led to the belief that the whole transaction—bottle, label, seal, and circular accompanying each bottle—was a counterfeit.

It is somewhat amusing to read that the original circular issued by the firm, a counterfeit copy of which accompanied each bottle of the spurious quinine, contains a ready method for discovering the fraud, viz. "1 gramme of sulphate of quinine, 4 grammes of ether, and 2 grammes of aq. ammoniæ should form a clear solution."

KAMEELA.

As met with in commerce, kameela is a powder of a dark brick-red colour, having, when recent, a peculiar, heavy odour, increasing on being rubbed between the fingers, but which diminishes with age. In the mouth it is gritty, and has a somewhat acrid taste. When exposed to a temperature of between 200° and 212° F., it undergoes no apparent alteration; when a small portion is dropped into the flame, it flashes up instantaneously. Its best solvents are ether, alcohol and solutions of alkalies, from which it is precipitated by water or acid in the form of a resinous substance. It has been analysed by several chemists, and found to consist of albumen, cellulose, volatile oil, volatile colouring matter, ashes and water; but chiefly of a resinous colouring substance, which constitutes over three-fourths of it. It almost always contains from 6 to 10 per cent. of sand, and 1 to 2 per cent. sesquioxide of iron; more than these amounts of foreign matter depreciates its value. Kameela are the glands that cover the capsules of a small tree or arborescent shrub found in the hilly parts of India, along the base of the Himalaya mountains, and growing from 15 to 30 feet high. Its name is *Mallotus philippinensis*, formerly known as *Rottlera tinctoria*.

The article has been known as a remedy for tapeworm among European and American physicians for only a few years, though long known and employed for this purpose in India. Dr. C. Mackinnon, a surgeon in the English army in India, first made its properties known to the profession, he having been almost invariably successful with it. Other practitioners since have employed it with equal success. In doses of from 2 to 4 drachms it purges, often with griping or nausea and vomiting, and producing from four to ten or fifteen stools. The worm is usually expelled entire, but often without the head, in the third or fourth stool, after 3 drachms of the powder have been administered. A strong alcoholic tincture acts more mildly and with more uniform effects. The dose of the powder for an adult is from $2\frac{1}{2}$ to 3 drachms, given in mucilage, syrup, or other vehicle; of the tincture, made in the proportion of 3 ounces to half a pint of alcohol, half a fluid ounce. The dose to be repeated if necessary.

Tannin will dissolve in water without the help of any agent. A few drops of alcohol, however, generally help to make the fluid clearer. The tannin is not impaired by it.—*Manufacturer and Builder.*

OINTMENT OF MERCURIC NITRATE.

The following remarks upon the preparation of this ointment have been furnished to the *Pharmacist* by Mr. Charles Fredigke, of Chicago:—

Being in need of some of this ointment, I prepared a quantity according to Mr. Rother's formula, which appeared in the *Pharmacist* for July last;* but when effervescence ceased, and the liquid only boiled, even under increased heat (as the formula reads), it turned rapidly to a dark brown colour, and after stiffening, and the addition of the mercurial solution, the ointment appeared of the colour of raw umber. On making a second trial the effervescence was allowed to go on very slowly, confining it to the centre of the liquid till it ceased. It had then a reddish-brown appearance—lemon-yellow at the edge. At this stage it was kept at a temperature between 185° and 190° F., as indicated by a thermometer, and was briskly stirred with a wooden spatula, to ensure the complete liberation of nitrous acid fumes, and the reaction of the acid on the lard. The result was a most excellent ointment, both in colour and consistence.

The patient and scientific research of Mr. Rother upon the reactions occurring in the preparation of this ointment, and the practical results he deduced from them entitle him to the thanks of the pharmaceutical profession at large; for I think that the reduction to a definite result of that which was formerly left to mortifying failures or mere chance, is of importance to every practical member of our profession.

* PHARMACEUTICAL JOURNAL, 3rd series, Vol. I. p. 107.

THE CHEMISTS' DEFENCE ASSOCIATION.

At a Public Meeting held in the Memorial Hall, Albert Square, Manchester, on Wednesday evening, February 22nd, 1871, to consider the proposed compulsory poison regulations, and the advisability of forming an Association of Chemists, for the purpose of resisting their enactment; on the motion of Mr. Jabez Waterhouse, seconded by Mr. Robert Hampson, Mr. W. S. Brown was called to the chair, and the following resolutions were unanimously passed:—

Moved by Mr. Robert Hampson, Manchester; seconded by Mr. Bostock, Ashton-under-Lyne,—

"That in the opinion of this meeting, the action of the majority of the Pharmaceutical Council, in proposing compulsory regulations for the storing and dispensing of poisons, is prejudicial to the true interests of the trade, uncalled for by the public, and ought to be strenuously resisted."

Moved by Mr. Kay, Stockport; seconded by Mr. E. Fisher, Ashton-under-Lyne,—

"That it is the opinion of this meeting, that if the Council of the Pharmaceutical Society really desire to ascertain the opinion of the whole of the members on the proposed compulsory poison regulations, and not merely that of a section who attend the annual meeting in May, they will make arrangements for voting by the use of proxy papers."

Moved by Mr. Jabez Waterhouse, Ashton-under-Lyne; seconded by Mr. Hunt, Manchester,—

"That an Association be formed, to be called 'The Chemists' Defence Association,' having for its objects:—

1st. To organize an opposition, and to adopt all suitable means to prevent a dominant section of the Pharmaceutical Council, influenced by the Medical Department of the Privy Council, from enacting compulsory regulations for the keeping and dispensing of poisons, such being unnecessary in the interests of the public, and from the vagueness of their character, and indefinite scope of application, are certain to prove most vexatious and objectionable to the members of the trade.

"2nd. To protest against the assumption that further regulations for keeping and dispensing poisons are needed to be applied to chemists:—the only true safeguards, viz. improved education, and adequate responsibility, being secured by the provisions of the Pharmacy Act, 1868, which have already produced considerable effects, and will, if allowed fair operation, speedily accomplish all that is required; and the attempt to apply further imperative regulations to chemists, whilst surgeons, veterinary surgeons, hospital dispensaries, etc., are excepted, would expose the public to greater danger from varying customs, than if no such unwise attempt had been made.

"3rd. To influence the forthcoming election of members of the Council, and to secure a more adequate representation of the widely expressed views of the trade on this important question."

Moved by Mr. Councillor Scott, Rochdale; seconded by Mr. Barnaby, Manchester,—

"That an Hon. Secretary, Treasurer, an Executive Committee consisting of twelve members of the Association—four to form a quorum,—and a General Committee with power to add to their number, be appointed."

Moved by Mr. Mumbray; seconded by Mr. T. S. Johnson,—

"That the Hon. Secretary be Mr. Robert Hampson; the Treasurer be Mr. Geo. Woolley; and the Executive Committee be Messrs. W. S. Brown, Benger, Barnaby, Hughes, Halliday, Kay, Reynolds, F.C.S., Robinson, Slugg, F.R.A.S., Jabez Waterhouse, Woolley and Wilkinson.

Moved by Mr. Benger, Manchester; seconded by Alderman Taylor, Rochdale,—

"That the officers be empowered to adopt all suitable means by correspondence, the issue of circulars and other agencies, to organize an effective opposition to the proposed compulsory poison regulations, and that contributions to the funds be solicited; that the Committee be empowered to employ such legal and other paid agency as they may judge necessary, and also to organize branch associations and other means to give effect to their action."

Moved by Mr. Fisher, Ashton-under-Lyne; seconded by Mr. Gill, Pendleton,—

"That every contributor of 2*s*. 6*d*. and upwards be a member of this Association."

The Pharmaceutical Journal.

SATURDAY, MARCH 4, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

CHLORAL HYDRATE.

We have no hesitation in expressing the opinion that in regard to purity, all articles of the *materia medica* should be, like CÆSAR's wife, above suspicion; and holding this opinion, it is with great pleasure we find it to be our duty to vindicate the character of an important therapeutic agent, which has been well described by a leading medical journal as one of the first contributions of pure chemistry to our materia medica. We are the more ready to perform that duty, since the first specific impeachment of the drug was published in the pages of this Journal. Although we have, in consequence, been overwhelmed with reclamations, and are now in a position to say that there was not really any foundation for the alarm and distrust which the statements in that article were calculated to excite, we nevertheless do not think it necessary to offer any apology for having given publicity to the article now referred to, for the simple reasons that we regard it as much a duty to expose the sale of inferior drugs as it is to defend the members of our craft against unfounded imputations, and that the paper was published in good faith, as one bearing on its face evidence of its being important to both pharmacists and medical men, as well as to the general public.

The letter which appears this week from Mr. MASON* sufficiently establishes the fact—already evident otherwise—that his experiments were affected by some source of error that invalidated his results. On general grounds this is satisfactory; and we have now only to express our regret for any temporary inconvenience or prejudice that may have been experienced by individual dealers in chloral hydrate. We have endeavoured in that respect to do all in our power towards correcting the erroneous impression conveyed by the paper immediately the error was pointed out, and we hope in this way to have satisfied all reasonable expectation. But we cannot undertake to occupy our space with the lengthy communications we have received from some sources, and indeed could not do so without affording ground for the charge of inserting trade advertisements out of their proper places. We have therefore made an abstract from the various communications to which we referred last week, and publish them in the correspondence column.* To conclude this matter, we may add here that there is abundant reason to believe that chloral hydrate, as now supplied for medicinal use, is generally of good quality; and that in regard to the chloral alcoholate, we have only met with one sample of it, and do not believe that it is to any extent, if at all, substituted for the hydrate.

* See page 719.

* See page 720.

SPIRITUS AMMONIÆ AROMATICUS.

Our contemporary the *Practitioner*, in further alluding to the subject of the analyses of some samples of the above preparation which were published in its columns and copied into these, is not pleased with our remarks upon them, contained in our issue of the 21st ult. The writer of the article in question states, there "surely can be no excuse whatever for the chemist who sells as sp. ammoniæ co. a preparation which contains only half, or less than a half, the proper quantity of ammonia, and only from three-fourths to four-fifths the proper amount of alcohol." Having had our attention thus pointedly drawn to the subject, we have taken the trouble to go more into detail, and to examine his results carefully. In reply to him we might, in the first place, without being accused of having a disposition to quibble, with justice, object that the samples were, according to his statement, "taken at random from six different chemists' shops,"† as sp. ammoniæ *comp.*, which is not official in the British Pharmacopœia, and was only once so in the London Pharmacopœia—that of 1787. It was then prepared by a different process to the present official one, which ought to contain the ammonia in solution as the normal ammonium carbonate. In the older preparation two drachms of each of the essential oils of lemon and of nutmeg were directed to be mixed—not distilled—with two pints of spirit of ammonia, this latter preparation being prepared by the double decomposition of sal ammoniac and potashes dissolved in proof spirit, and a certain quantity distilled. It would, therefore, contain the ammonia in solution as a mixture of the normal and acid carbonates. Sp. ammoniæ comp. thus made would also contain a less percentage of alcohol than the present spiritus ammoniæ aromaticus. There are pharmacists who keep both the above preparations, and if sp. ammoniæ comp. is prescribed—as it often is—sp. ammoniæ comp. is dispensed. They would no more think of substituting the new for the old preparation than they would pilula ferri carbonatis for pilula ferri composita.

† One of these, where, according to the published analyses, the worst sample was purchased,—that of 44, Southampton Row, Bloomsbury,—is an open surgery. No such name as John F. Staines appears on the Register of Chemists and Druggists at this address; nor yet does it appear on the Medical Register, although the facia states that the proprietor is a surgeon.

In the second place, the writer doubts from his own inquiries, "whether any section of the public has the slightest objection to the official sal volatile." On this point we may inform him that there is a section—we forbear to mention it, further than to state that it is the one which has the most refined taste,—which we know has a great preference for it when flavoured with a substance which is not in the official formula. The following case, which came under our notice some years ago, illustrates how materially the tastes of some persons differ with respect to that preparation. An English family having been travelling in Scotland, on their arrival in the North of England, applied to a pharmacist for a supply of sal volatile,—had he any which he could recommend? Yes; his was So-and-so's make, mentioning a noted Edinburgh house. "Just what we did not want," said the gentleman; "we have been in Scotland during the last month, and have not been able to obtain any but that of Edinburgh make, (that of P. E. contained oil of rosemary,) and my wife does not like it; we felt sure we should be able to obtain some of English manufacture here." No sale was effected. As traders, pharmacists find it necessary to study the tastes of their customers.

Lastly, our contemporary does not publish the details of the analyses. The writer assumes that Spiritus Ammoniæ Aromaticus prepared by the official process would contain all the ammonia directed to be employed in its manufacture, nay—he erroneously assumes even more, as the quantity of ammonia he states it ought to contain should be 2·6 per cent. by weight in volume. By a careful calculation,* we find that supposing the whole of the ammonia (NH_3) ordered in the formula were contained in the seven pints of distillate, which is the resulting yield of the official quantities, it would only contain 2·473 per cent. by weight in any given volume.

The compilers of the 1864 edition of the British Pharmacopœia, who introduced the present process for the manufacture of spiritus ammoniæ aromaticus, tried "to ensure the formation of a neutral carbonate of ammonia"† in solution in that preparation. But this neutral "carbonate is insoluble in alcohol" (absolute), and "an aqueous solution of it is precipitated by alcohol, the precipitate being acid carbonate or intermediate in composition to that and the normal carbonate."‡ If to the aqueous solution rectified spirit be added, as in Mr. Martindale's experiment (2), p. 704, the crystalline formation is most probably the normal carbonate itself.

With these remarks we will leave the matter with the members of the medical profession: we trust that in future, when they censure us for shortcomings, they will clearly establish their case, and hold the balance of justice fairly, so that no trader shall meet with such an unmerited share of obloquy as our contemporary has dealt out.

* See p. 704.

† Dr. Garrod's 'Materia Medica and Therapeutics,' 3rd edit. p. 47.

‡ Divers on the Combinations of Carbonic Anhydride with Ammonia and Water.

THE CALENDAR FOR 1871.

Following closely upon the issue of the Register, referred to last week, the Calendar of the Pharmaceutical Society for the present year is now ready. It contains a list of all persons who are connected with the Society, corrected up to a recent date. It is gratifying to notice the increase in the length of some of these lists, notably in that of the Chemists and Druggists who are Members of the Society, where it amounts to nearly two hundred names beyond last year. There is also a considerable augmentation in the numbers of the Associates, both of those who are and those who are not in business and of the Registered Apprentices.

Besides these lists the Calendar contains the Charter, Bye-laws and Pharmacy Acts, the Regulations of the Board of Examiners, the Examination Papers for the past year, and much useful information concerning the School of Pharmacy at Bloomsbury Square. This is followed by a list of Donors and Subscribers to the Benevolent Fund, giving the number of votes to which each is entitled. In the Appendix are printed remarks on, and extracts from, several Acts of Parliament, Regulations and General Orders, in which Chemists and Druggists may be interested, such as the Medicine Stamp and Licence Acts, the Petroleum Act, the Act to Regulate the Sale of Poisons in Ireland, the Regulations as to Navy Dispensers, etc. Altogether the Calendar will doubtless be very useful to those for whose convenience it is issued by the Council.

OPIUM CULTIVATION.

The question of opium cultivation is just now exciting considerable interest. The reports from different sources (some of which have been printed in this Journal) that it is being attempted on a large scale in many parts of the world, and notably in China, have not only raised the hopes of those by whom it is largely used that the present price may be materially reduced, but they have also awakened the anxiety of statesmen as to the permanence of the revenue at present derived from it in India. We give the gist of some remarks upon the subject from a leading article in the *Times* of Monday last.

As a tax not open to the objection of being levied on an article of prime necessity, the profit made by opium sales is the most defensible form of Indian taxation, though there is more than one other point of view from which it cannot be regarded with satisfaction; but apart from the moral arguments which may be urged against it, Mr. Grant Duff's budget supplies a notable proof of its speculative character. The anticipated surplus of 1870–71 is chiefly due to the fact that "opium has come to the rescue," having realized 1113 instead of 975 rupees per chest.

However grateful we may be for this relief, we cannot forget that opium has before now deserted us with equal fickleness in the hour of need, and that it is, in fact, the most precarious and unstable of all financial resources.

Our contemporary *Nature* states that at Cambridge it is proposed to increase the stipend of the Professor of Chemistry from £300 to £500 per annum. It is also proposed to appoint a Demonstrator of Chemistry at £150 per annum.

The *British Medical Journal*, in a report of a chemical examination of samples of chloral hydrate, expresses disapproval of the practice of stating the dose upon labels attached to chloral hydrate. It says, "In some cases this is done in such a way as to suggest the idea that it is intended for amateurs and as a facility for self-treatment. Considering the possibility that there is, to say the least, of this medicine being misused, and the number of fatal cases which have lately occurred where over-doses of chloral hydrate are suspected of being the cause of death, this is a point on which it is scarcely possible to lay too much stress."

The trustees of the British Museum have appointed Mr. W. Carruthers, F.L.S., F.G.S., to the Keepership of the Botanical Department, recently vacated by the resignation of Mr. J. J. Bennett, F.R.S. Mr. Carruthers, who has been Senior Assistant in the Department several years, is well known to botanists by his contributions towards the study of Fossil Botany.

The method of watering the streets with a solution of the chlorides of sodium, calcium and aluminium, as proposed by Mr. Cooper, appears to have been successfully carried out in Westminster, and is now being adopted in St. Luke's, Finsbury, and several provincial towns.

The following is the list of officers and council of the Royal Microscopical Society for the current year:—President, W. R. Parker, F.R.S.; Vice-Presidents, Charles Brooke, F.R.S., J. E. Gray, F.R.S., J. Millar, F. H. Windham; Treasurer, Richard Mestayer; Secretaries, Henry J. Slack, Jabez Hogg; Council: R. Braithwaite, M.D., John Berney, James Glaisher, F.R.S., W. J. Gray, M.D., Henry Lawson, M.D., Henry Lee, James Murie, M.D., G. W. Royston Pigott, M.D., J. W. Stephenson, Charles Stewart, Charles Tyler, T. C. White; Assistant-Secretary, Walter W. Reeves.

In a communication to the *British Medical Journal*, Dr. Lionel Beale says:—

"You have twice directed attention of your readers to some unphilosophical remarks which the Professor of Natural Philosophy in the Royal Institution of Great Britain, the successor of Faraday, has thought fit to make in a book he has recently published. It may be important the profession should know, and it is desirable the fact should be recorded, that 'tolerance,' and of a particular kind, has been extended both by Dr. Tyndall and Mr. Huxley to one among many who, as the former observes, foolishly (!) try to support or oppose the fiery-cloud-origination hypothesis. Dr. Tyndall says, 'Both Mr. Huxley and myself have long practised, and shall, I trust, continue to practise tolerance' with reference to one conspicuous member 'of the class of microscopists, ignorant alike of philosophy and biology, a Doctor of Medicine, lately Professor in a London College famous for its orthodoxy'! ('Use and Limit of the Imagination in Science,' p. 49.) Let us not attempt to restrict in any way the liberty accorded to 'privileged spirits.' As Dr. Tyndall observes, freedom to them is of paramount importance. They must have liberty to speak openly; and, if they tolerate the 'weaker brethren,' all may be thankful. What would have happened if Dr. Tyndall and Mr. Huxley had not practised tolerance, and what would happen were they not to continue to practise tolerance, with reference to the 'Professor in a London College famous for its orthodoxy'?"

The *Chester Courant* in a recent issue calls attention to the unnecessarily late work which has to be done by druggists, and suggests that, in order to give more time for study to young men preparing for their examinations, the public should endeavour to send all orders during the proper hours of business, and that only exceptionally urgent medicines should be applied for after the shops are closed or on Sunday.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

February 21st, 1871.

Present—Messrs. Aitken, Baildon, Brown, Buchanan, Kemp, Mackay and Young.

Twelve candidates were examined,—six for the First or Preliminary Examination, two for the Minor, one for the Major, and three for the Modified; the following passed, and were declared to be duly qualified to be registered:—

FIRST, or PRELIMINARY (as Apprentices or Students).

Brown, Robert .... Leith.
Kemp, John .... Inverness.
Lawler, Hugh .... Edinburgh.
Wood, James .... Edinburgh.

MINOR (as Chemists and Druggists).

Wilson, Thomas Davison ...... Sunderland.
Kemp, John .... Inverness.

These names are arranged in order of merit.

MAJOR (as a Pharmaceutical Chemist).

Strachan, Alexander .... Aberdeen.

MODIFIED (as Chemists and Druggists).

Harcus, John .... North Shields.
Matheson, James .... Dornoch.
Stothard, Thomas .... North Shields.

These names are arranged in order of merit.

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The Half-yearly Meeting of the above Association was held at their Rooms, 4, Halford Street, on Friday, February 3rd, 1871; the President, Mr. Joseph Young, in the chair. After the usual preliminary business of the evening had been transacted, the President called upon Mr. S. H. CADOUX (Hon. Sec.), to read the following Report:—

"The Committee of the above Association, in presenting their Half-yearly Report for the Session ending February 3rd, 1871, have the privilege of stating that the conclusion of this, its Third Session, still finds the Association in a very flourishing condition. Your Committee have met with the most encouraging assistance from the honorary members, the list of which now includes every leading principal in the town. The Committee have also advantageously secured the present rooms, concerning which very general satisfaction has been expressed.

"During the Session forty-nine meetings have been held (exclusive of the usual half-yearly examinations), as follows:—For Botany 7, Arithmetic 9, Latin 9, Materia Medica and Pharmacy 9, and Chemistry 11; the remaining four evenings being occupied by the reading of papers and lectures by as many honorary members. The attendance has been throughout very fair; the Chemistry and Materia Medica classes have secured the largest attendances, Latin and Botany next. Arithmetic having failed to maintain the original interest taken in it, your Committee recommend to the officers of the ensuing Session its discontinuance, thus complying with the suggestion of the Pharmaceutical Committee for Provincial Education.

"During the Session two members have obtained the Major, one member the Minor qualification of the Pharmaceutical Society, and one member has successfully passed the "Modified" Examination: thus in the short space of one year making fifteen pharmaceutical examinations which have been passed by eleven members of the Association, viz.:—2 Major, 4 Minor, 3 Modified, and 6 Preliminary. Such a result for so small an Association the Committee believe to be without a parallel.

"Finally, your Committee express their belief that the Annual Supper (held on the 2nd instant), tends not only to promote the interest of the honorary members of your Association, but is greatly conducive to that good feeling among principals and their assistants which, for the interest of future pharmacy, it is desirable to maintain."

After the reading of the Hon. Treasurer's Report, which showed a balance in hand of £4. 7*s.* 10½*d.*, the meeting proceeded to ballot for the Committee to serve during the ensuing half-year.

The following gentlemen were elected:—Messrs. W. P. Clark (P.C.), *President;* Hy. Cooper (P.C.), *Vice-President;* Jos. Young, (P.C.), *Hon. Treasurer;* T. Wright (A.P.S.), *Hon. Secretary;* S. H. Cadoux, W. E. Hill (A.P.S.), and T. Miller.

A programme of classes, lectures, etc., to be held in connection with the Association during the next half-year has been issued.

SCARBOROUGH CHEMISTS' ASSOCIATION.

A Meeting of the Association was held on Monday, Feb. 20th; the President, Mr. G. PORRETT, in the chair. A majority of the members were present, the special object being to consider the proposed compulsory regulations for storing and dispensing poisons, which were freely discussed, and the following resolution passed:—

"That this Association unanimously and emphatically condemns the action of those of the Pharmaceutical Council who wish to impose on the trade restrictions which are altogether unfair and unnecessary, believing that the tests of competency now required are sufficiently adapted to secure the safety of the public."

It was also resolved, "That concerted action be taken with other Associations to secure the withdrawal or rejection of the proposed obnoxious regulations."

MEETING OF CHEMISTS AT BARNSTAPLE.

At a Meeting of the Chemists of this town it was resolved that the proposed second and third poison regulations are impracticable, delusive and unnecessary, and that the third especially (while an excellent regulation in the dispensing of prescriptions) would totally fail in its object, and could not possibly be adhered to in many poor districts.

As the sale of poisons is now restricted to chemists whose status and education will be continually improving, it was suggested that as personal responsibility will still rest on each individual, the following regulations will be all that can be reasonably required:—

1. In the keeping of poisons each bottle, vessel, box, or package containing a poison shall be labelled with the name of the article, and also with some distinctive mark indicating that it is poison, and shall be kept in a cupboard, drawer, box, or shelf set apart for dangerous articles.
2. All liniments, embrocations and lotions containing poison shall be sent out in bottles with a label on green or red paper, giving notice that the contents of the bottle are not to be taken.

These regulations to be enforced after the 1st of January, 1872.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Monthly Meeting of the above Society was held on Monday evening, Feb. 13th, on which occasion a lecture was delivered on "Heat" by Mr. J. HARRISON, to a numerous audience of members and associates. After the lecture it was announced that Dr. Donkin, lecturer on medical jurisprudence to the University of Durham, had kindly promised to deliver a lecture in May, on "Arsenic;" and with the usual votes of thanks the meeting separated.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The following gentlemen were duly elected to membership at a recent meeting of the Executive Committee:—

Ayre, H. M., Warwick.
Beal, E. J., Ilford.
Borland, J., 7, King Street, Kilmarnock.
Burn, Mr., 138, Coronation Street, Sunderland.
Canning, W., 14, Bath Street, Newgate Street, E.C.
Carran, T., Peel, Isle of Man.
Chapman, Mr., Hendon Road, Sunderland.
Church, Professor A. H., Royal Agricultural College, Cirencester.
Cockeroft, A., Richmond, Yorkshire.
Colchester, William, jun., 2, Crown Street, Hoxton Square, N.
Curtis, H., Lewes.
Daniel, S., 30, Market Place, Reading.
Davenport, J. T., 33, Great Russell Street, W.C.
Davies, T. M., 1, Eversfield Place, St. Leonard's.
Glazier, W. H., 95, Edgware Road, W.
Goodwin, J., Lower Clapton, E.
Gunn, D., 9, Sheldon Street, Bishop's Road, W.
Harvie, G., Helensburgh.

Hay, D., Nelson-in-Marsden, Burnley.
Hunter, H., Layport Street, Alnwick.
Ingham, J., Upper Tooting, S.W.
Johnson, M., Huyton, near Liverpool.
Knowles, W. H. H., Upper Bridge, Holmfirth.
Lake, R., 17, Bloomsbury Square, W.C.
Luff, W., jun., Oxford.
Mason, J. H., Workington.
Metcalfe, W. C., Burneston, Bedale.
Mills, W., Sydney, New South Wales.
Moore, R., Post-Office, Dale Street, Ossett.
Nashill, T., Holmeside, Sunderland.
Owen, R. J., 53, Bath Buildings, St. Mary Charterhouse, E.C.
Parker, J. S., Messrs. Sturton and Sons, Peterborough.
Pennington, T., 14, Bolton Street, Bury, Lancashire.
Phillips, G. W., 43, Leather Lane, E.C.
Pick, R., South Parade, Northallerton.
Potter, H., Sutton, Surrey.
Priestly, J., Beech Street, Sunderland.
Pritchard, J., 67, Chorlton Road, Manchester.
Robinson, J., 2, North Gate, Darlington.
Sargent, D., 222, Albany Road, Camberwell, S.E.
Savory, H. B., Painswick, Gloucestershire.
Skidmore, J., Chilworth Street, Paddington, W.
Smith, W. H., County Hospital, Brighton.
Spence, P., Pendleton Alum Works, Manchester.
Squire, A., 1, Bush Lane, E.C.
Squire, A. P., 1, Bush Lane, E.C.
Steel, F. W., 283, Liverpool Road, Islington, N.
Steward, J., High Street, Brierley Hill.
Sykes, T. H., Lord Street, Southport.
Thompson, H., Moor Street, Sunderland.
Thompson, W., 87, High Street East, Sunderland.
Truman, H. V., Angleside Villas, Streatham, S.W.
Watling, A., 59, Camberwell New Road, S.E.
Weaver, E., 29, Chapel Street, Belgrave Square, S.W.
While, W. J., 45, Westbourne Road, Bayswater, W.
Windsor, G., Torpoint, Devonport.
Wink, J. A., 17, North Bridge, Edinburgh.

Candidates for Membership.—Gentlemen sending in their names to the London Secretary, Professor Attfield, 17, Bloomsbury Square, W.C., and enclosing the subscription, 5*s*., and 7½*d* for postage (in stamps or P.O.O. payable to John Attfield, at the Bloomsbury Office), will receive, by return of post, a copy of the 'Year-Book.' The price of the volume to non-members is 7*s*. 6*d*.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCY.

The office of Dispenser at the Great Northern Hospital, N. Candidates are requested to send their applications, with copies of testimonials, to Mr. George Reid, Secretary, 40, Great Coram Street, W. C.

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"On Astronomy." By Mr. R. Proctor.
TUESDAY ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.
WEDNESDAY...*Society of Arts*, at 8 P.M.—"The Cultivation and Uses of Sugar Beet in England." By Dr. Augustus Voelcker.
Royal Microscopical Society, at 8 P.M.
THURSDAY......*Royal Society*, at 8.30 P.M.
London Chemists' Association, at 9.30 P.M. "Remarks on Structural Botany." By Mr. J. H. Jessop.
THURSDAY......*Royal Institution*, at 3 P.M.—"Davy's Discoveries in Chemistry." By Prof. Odling.
FRIDAY ....*Quekett Club*, at 8 P.M.
SATURDAY ...*Royal Botanic Society*, at 3.45 P.M.

Parliamentary and Law Proceedings.

SUICIDE BY PRUSSIC ACID.

An inquest has been held at Falmouth to inquire into the death of a young woman named Mary Pitts, who had been found dead in a room where she had been lodging a few days.

Mr. Mitchell, chemist, Market Strand, identified the deceased as having called at his shop to purchase some chloroform for a toothache, after which she wished to be supplied with a small quantity of prussic acid, stating she used it for the purpose of cleaning her jewellery. He informed her of its deadly nature, and she replied that she had no difficulty in obtaining it in London, as she had a brother practising there as a physician. Being thrown off his guard by her manner, he supplied her with half an ounce. Witness produced his register which she had signed, calling herself "Isabella Vaughan," and identified the bottle that had contained the poison as having been supplied by him. The next day she again called and said that while cleaning her jewellery she had accidentally broken the bottle, and he believing her statement, supplied her with another half ounce.

Dr. Guppy said that upon being called in, he found the deceased cold and stiff, and judged she had been dead several hours. He picked up pieces of paper from the floor, which on being placed together formed the label that had been removed from the bottle. In reply to a juror, he said that deceased could not have lived more than two minutes after taking the poison. He thought she was pregnant.

The jury returned a verdict that the deceased died from the effects of poison, but as to the state of her mind at the time there was no evidence to prove.

CASE OF POISONING BY CHLORAL HYDRATE.

In a report of the case of death from an overdose of chloral noticed in the PHARMACEUTICAL JOURNAL, p. 636, furnished to the *British Medical Journal* by Messrs. W. J. Hunt and R. W. Watkins, they state that the deceased first had the prescription (which had been sent to him by a relative) dispensed by a chemist, but afterwards procured from him the chloral alone in ounce-bottles. The chemist, Mr. Tite, thinking he was taking larger doses than was safe, cautioned him as to the use of it, and showed him an article in the PHARMACEUTICAL JOURNAL describing the ill effects of an overdose, loss of power in the lower extremities being the most prominent one. He informed Mr. Tite that on one occasion, after taking three doses in one night, he had felt that effect in the morning, having fallen down twice on getting out of bed. Mr. Tite estimated that on that occasion he had taken seventy-five grains. He subsequently procured a copy of that number of the Journal, and in it there happened to be an advertisement of hydrate of chloral from a wholesale house. This, it would seem, induced him to obtain from that firm a box containing sixteen ounce-bottles of hydrate of chloral, half of which he had expressed his intention of sending to a relation. The housekeeper had often seen him dissolving the chloral in water, in a half-pint bottle (labelled "Chloral Hydrate, 1870"), from which he was in the habit of taking a wineglassful at bedtime; but she did not know the quantity of chloral dissolved each time. She had seen him take a dose from the bottle the night before his death. On January 17th, he had purchased from Mr.

Tite an ounce of chloral; and the supply from London had arrived subsequently to that date. After his death, fifteen of the bottles were found full, and one empty; about two ounces of the solution remaining in the bottle above mentioned, on the table in his bedroom. From this we conclude that, in the ten days between the 17th and 27th of January, he had taken fourteen drachms of chloral—presuming that the solution in the bottle contained an ounce to the half-pint. If, however, it contained half an ounce only, the bottle must have been four times filled; and he had, therefore, taken fifteen drachms in the ten days. He was constantly in the habit of "doctoring himself," and, among other things, frequently took carbonate of soda, as much as eighty grains at one dose—purchasing it from Mr. Tite by the half-pound. His housekeeper was not aware whether he had taken any on the night before his death; and we are, therefore, unable to ascertain whether any decomposition of the chloral had taken place.

Action for Poisoning a Dog.

A case of considerable interest to sportsmen occupied Mr. Baron Cleasby the whole of Monday at the Warwick Assizes. The plaintiff, the Rev. James Finch, curate in charge of Burmanton, near Shipston-on-Stour, Warwickshire, sued the gamekeeper of Mr. Thomas Wright, of Tidmington House, Worcestershire, to recover £50, the value of a favourite Pomeranian dog of the plaintiff's, alleged to have been poisoned by the defendant. The case for the plaintiff was, that the defendant placed strychnine in rabbits' paunches, and left them about the coverts, and that the dog, which the defendant had threatened to destroy, was poisoned by the strychnine. The latter fact was conclusively established by an analysis of the dog's stomach. The jury found a verdict for the plaintiff, with £10 damages.—*Daily News.*

Poisoning of a Child by Caustic.

An inquest has been held in Leeds to inquire into the circumstances attending the death of Frederick William Day, fourteen months old. The child had been taken to Mr. Holmes's surgery, in Beckett Street, in consequence of its having a slight ulceration under its tongue. Mr. Holmes, having instructed his assistant, Mr. Jenkinson, to apply some caustic to the part affected, he took a piece, wrapped it in paper, and, holding it in his right hand, applied it to the ulcerated part of the tongue. Whilst he had his fingers in the child's mouth it suddenly threw back its head, and its gums, coming in contact with the caustic, knocked it out of the operator's fingers, and it slipped down the child's throat, its death following a few hours afterwards. A *post-mortem* examination was made by Mr. Scattergood, who found that the death had been caused by caustic. Evidence was given that caustic was sometimes applied in the way it was in this case, but that it was safer to apply it in a holder. The jury returned a verdict that the child had been accidentally poisoned, but expressed an opinion that the mode employed was not a safe way of applying caustic when it was to be used inside a person's mouth.—*Leeds Mercury.*

[*** It is not stated in the report what caustic was used, but we suppose it to have been nitrate of silver.—Ed. Pharm. Journ.]

Case of Alleged Poisoning.

On Monday, at the Town Hall, Newnham, William Masson, a Licentiate of the College of Physicians of Edinburgh, and Edward Henry Coleman, an apothecary of Mitcheldean, were charged with feloniously killing and slaying Ann Masson, wife of the said William Masson.

In January last an inquest was held at the residence of Dr. Masson, at Mitcheldean, on the body of Mrs. Masson. The husband then stated that his wife had access to his surgery, and took two drachms of laudanum while suffering from neuralgia. He called in an apothecary named Coleman (the other prisoner), who administered hot brandy-and-water. Mrs. Masson fell back in a comatose state and died in forty-three hours afterwards. Suspicions were aroused with regard to the conduct of Masson, and hence the present proceedings.

Mr. Charles Whatmough, a surgeon, was called in to see Mrs. Masson on Saturday night, the 14th of January, and found her in a perfectly helpless state of coma. Dr. Masson said she had taken about two drachms of opium from a bottle in the surgery, having wasted a portion on the counter; that he had prepared an emetic of sulphate of zinc and mustard, which she refused to take; and that she had taken a hot glass of brandy-and-water. Witness gave it as an opinion that, prior to the comatose state, death might have been prevented or retarded by scientific means.

Mr. Fitzherbert Jones, a surgeon, was also called to see deceased a few hours before her death. He knew of no medical authority that recommended hot brandy-and-water for poisoning by opium.

Thomas Buchanan Washbourn, M.D., was of opinion that death might have been prevented or considerably retarded by scientific means. The usual means would have been to administer an emetic or to use the stomach pump, which might certainly have been done with effect before the patient was in a comatose state. The stomach pump might have been used with effect after stupor had commenced. Cold affusions and moving about would retard comatose symptoms. The sleepiness mentioned in the evidence before the coroner by the prisoner Coleman he should have considered as the commencement of stupor. He considered that brandy-and-water would, under such circumstances, lend an additional force to the narcotic influence of the poison. Death would be accelerated according to the quantity of alcohol taken.

Margaret Maclough said that Dr. Masson married her sister, who was then a servant living at Guy's Hospital. Her sister died on Sunday morning, the 17th of January, after drinking laudanum from a bottle. She spoke to the frequency of quarrels between the Doctor and her sister. After her death Dr. Masson told her not to say that her sister had not taken poison purposely, and promised her money and her sister's clothes, cautioning her that if she said anything her sister's body would be cut in pieces and buried in the cross roads. That frightened her so that she did not say anything about it until questioned by a policeman in London. She was quite certain they had quarrelled on the day the poison was taken.

Witnesses were called for the defence, whose evidence contradicted the statement of the girl as to the terms on which the prisoner and deceased lived together.

The Bench eventually committed both prisoners for trial, refusing to accept bail in the case of Dr. Masson.—*Standard.*

Poisoning by Carbolic Acid.

On Monday last, a police officer named Jefford, who has lately been acting as inspector at the Dale Street Police Court, Liverpool, called a man named Thompson, whom he asked to fetch him a pint of beer. Thompson said he had no bottle, and Jefford then took one from a cupboard in the passage and gave it to him. Thompson then brought the beer, and placed the bottle at the back of some boxes which were close to the cupboard from which the bottle was taken. Having done so, he was going along the passage, when he heard Jefford call out that he had taken something wrong, and he was expectorating violently. Thompson hurried back, and found that Jefford had not taken the beer, but that he had begun to drink from a bottle which contained carbolic acid, which had been placed by some one at the top of the boxes. Jefford was at once removed to the Royal Infirmary, where he became insensible, and after lingering five hours died.—*Standard.*

Attempted Suicide by Oxalic Acid.

A young woman was brought up at the Greenwich Police Court on Tuesday, charged with attempting to commit suicide. It appeared she had been found at her master's house, suffering from the effects of having swallowed a quantity of oxalic acid, which she said she had purchased of a neighbouring chemist. She was remanded for a week.

HOUSE OF COMMONS.

Adulteration of Wines.

On Thursday, Feb. 23, Sir J. Lawrence asked the Chancellor of the Exchequer if his attention had been called to a statement that a recent test of sherry wines, described as of superior quality, had shown that they were adulterated with an acid highly injurious to health; whether it was true that the adulteration had been made in the docks, with the knowledge of the officers of Customs; and whether the officers of Customs had received instructions to afford every facility for the adulteration of wines in bond, provided the owners declared such adulteration to be for the purpose of fortifying the wine.

The Chancellor of the Exchequer said that he had made inquiry and had been informed that no adulteration had been carried on with the cognizance or permission of the officers of Customs. Orders were not given to tolerate any adulteration whatever, but that persons having wines in bond should be permitted to fortify those wines, that being absolutely necessary for their preservation. They were also allowed in the event of the wines becoming "cloudy," to use some means of refining them; but the officers are strictly forbidden to allow any adulteration whatever.

Sir J. Lawrence gave notice that he would move for a return of the quantity of Hamburg and other spirits used in the docks for fortifying wines.

Opium Cultivation in India.

Mr. Grant Duff brought forward the Indian Budget on Friday, Feb. 24. In the course of his speech he said concerning the Indian finances, that the one great fact of the year 1870–71, just drawing to a close, was that opium had come to the rescue. When Sir Richard Temple made his statement in April last, nothing could be much more gloomy than the prospect of the opium revenue for the financial year which had just begun. From almost all quarters came prophecies of evil, the prophecies from China being the gloomiest of all. Her Majesty's late representative at Pekin even went to Calcutta to confer with the Governor-General about the increased growth of the poppy in China. Owing to some unknown cause, all these anticipations had been falsified. Sir Richard Temple took the price of the chest of Bengal opium for the year at 975 rupees, whereas the average by the latest advices had been 1113 rupees. In spite, however, of the favourable results of this year, he thought it necessary that the opium revenue should be watched with extreme care. Considering the enormous extent of country, even in Asia alone, where the poppy can be grown with fair success, it was too much to hope that the Indian drug will continue to be so distinctly preferred by those who can buy it as to enable us to lighten by many millions year after year the price which India pays for civilized government; for whatever might be said against the opium revenue, it should not be forgotten that hardly any of it comes out of the pockets of our Indian fellow-subjects, and if it were done away with, India would not be lightened of an impost, but robbed of a splendid estate. He said also that the sudden death of Dr. Anderson had not prevented them continuing the arrangements that gentleman had made for naturalizing the ipecacuanha plant in India.

Mr. Cave said that in Bengal opium was a Government monopoly. Government not only taxed it, but they grew, manufactured and sold it. This opium revenue had an ugly look in more ways than one, for we charged so high for the drug that we had fostered its growth not only in China, where at present it had found no suitable soil, but in Persia, where he understood it was nearly as good as in India, so that we might possibly lose this source of revenue without having the credit of giving it up for conscience' sake.

Mr. W. Fowler maintained the opinion he expressed a year ago about the opium revenue. It had been justly compared to a revenue derived from an enormous distillery carried on at the public expense. Such a thing would not be tolerated for a moment, and yet we talked of the opium revenue as perfectly innocent. In his opinion it was an immoral thing for the Government to have a hand in, and the sooner they got rid of it the better.

BOOKS RECEIVED.

Dr. Dobell's Reports on the Progress of Practical and Scientific Medicine in Different Parts of the World. Vol. II. June, 1869, to June, 1870. London: Longmans and Co. From the Publishers.

Uebersicht der Cinchonen von H. A. Weddell. Deutsch bearbeitet von Dr. F. A. Flückiger. Schaffhausen und Berlin. 1871. From Dr. Flückiger.

Obituary.

COUNT CYPRIAN WOLLOWICZ.

On the 20th of February, Staff Assistant-Surgeon Count Wollowicz died at Netley, after a prolonged illness, in the thirty-second year of his age. The deceased gentleman belonged to a distinguished Polish family, and took an active part in the unsuccessful attempt to re-establish the independence of his native country. Upon the failure of that attempt, he studied medicine at Berlin and Munich, taking in 1862 the degree of Doctor of Medicine at Munich University. After visiting France, Spain and Italy, he eventually came to England, where he became naturalized. In 1867 he entered her Majesty's service as Assistant Staff-Surgeon, having taken the second place among forty-four competitors in the combined Chelsea and Netley examinations. He afterwards served in the Abyssinian campaign, where, it is supposed, he contracted the disease which ultimately proved fatal to him. Upon his return he went again to Netley, where he was associated with Professor Parkes, F.R.S., in a course of experiments on the influence of wine and alcohol on the human body, which formed the subject of two papers read before the Royal Society and abstracts of which have been published in recent numbers of this Journal.

The following journals have been received:—The 'British Medical Journal,' Feb. 25; the 'Medical Times and Gazette,' Feb. 25; the 'Lancet,' Feb. 25; the 'Medical Press and Circular,' March 1; 'Nature,' Feb. 23; the 'Chemical News,' Feb. 24; 'Journal of the Society of Arts,' Feb. 23; 'Gardeners' Chronicle,' Feb. 25; the 'Grocer,' Feb. 25; 'Produce Markets' Review,' Feb. 25; the 'English Mechanic,' Feb. 24; the 'Journal of Applied Science' for March; the 'Doctor' for March; the 'Brewers' Guardian' for March; the 'Educational Times' for March; the 'Falmouth and Penryhn Times;' the 'Chester Chronicle.'

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[151.]—LIME JUICE AND GLYCERINE.—Most preparations bearing the above name are merely emulsions of almond or olive oil, with lime water or saccharated solution of lime, variously perfumed, and with or without the addition of glycerine. A really "elegant" and useful dressing for the hair may be prepared as follows. It certainly has a more just claim to the above title than most lotions.

℞. White Wax ℥ss
Oil of Sweet Almonds ℥viij.

Incorporate by heat of a water-bath, and add gradually S. A.

Glycerine ℥j
Lime or Lemon Juice, or } ℥j
Citric Acid gr. xxxiij }
Water ℥j }
Rectified Spirit of Wine ℥ss
Water ℥ij
Ess. Lemons ʒij
Essential Oil of Almonds gtt. v.

FRED BARRETT.

In reply to *A. C.*, for a recipe for Lime Juice and Glycerine, I think the following will be found a very good one, and will not separate, as the one *F. C. S.* has given:—

℞. Ol. Amygdalæ ℥iss
Ol. Ricini ℥ij
Liq. Calcis ℥iiss
Otto Rosæ q. s.

Shake well.—J. S. PARKER, *Peterborough.*

℞. Ceræ Alb.,
Cetacei, ana ʒij
Ol. Amygd. ℥viij
Succ. Limettæ ℥vj
Glycer. Boracis ℥ij
Ess. Limon. ℥ss
Ess. Bergam. ʒij

Melt the wax and spermaceti, add the oil and perfume, then shake till cold with the lime juice and glycerine previously warmed.—ALFRED UTLEY.

[172.]—CRYSTAL VARNISH FOR NEGATIVES can be made by dissolving 2½ lb. White Shellac, ½ lb. Mastic, and ¼ oz. Camphor, in 1 gall. hot Alcohol, 64 O.P., and filtering. As a practical photographer, I find it does not pay to make in small quantities on account of waste.—ARTHUR ELSDEN.

[176.]—ROSE EMOLLIENT.—*E. H.* would like to be supplied with a recipe for preparing Rose Emollient.

[177.]—SALAD DRESSING.—Will any reader kindly favour me with a good recipe for the above, which will not separate?—MEDICINA.

[178.]—SUGAR OF LEAD.—Will any of our readers let me know the cheapest process for the manufacture of sugar of lead on the large scale?—CHEMICUS.

[179.]—MOSS ROSE PERFUME.—"*Beta*" would be glad if any one would furnish him with a good formula for inexpensive "Moss Rose" perfume.

[180.]—COPYING INK.—*C. W. J.* would be glad if any correspondent would give a good form for copying ink.

[181.]—WHITE SEALING-WAX.—*C. W. J.* also asks for a form for making white sealing-wax for spirit merchants' use.

[182.]—NINE OILS.—"*Rusticus*" wishes for a formula.

Correspondence.

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

THE PROPOSED POISON REGULATIONS.

Sir,—Kindly permit me, as a member of the Pharmaceutical Society,—not as a member of the Council,—and in as few words as possible, to place before the readers of this Journal and the members generally, some remarks relative to the adoption or otherwise at the Annual Meeting of the proposed regulations as to the keeping and dispensing of poisons.

In the first place, the present Council was bound by a resolution passed at the last Annual Meeting, to take the subject into consideration, and make a further report at the next Annual Meeting, so that under any circumstances, at the risk even of opposition from every side, the Council is in a manner compelled to do this, and, as far as I see, cannot do less. Granted that regulations must be submitted, it is still open for any or every member of Council to vote against their adoption, although obliged by the resolution of the last Annual Meeting to bring them forward in some shape or other.

Secondly, I am aware that it would be more than inconvenient to a very large number of gentlemen, both provincial and metropolitan, to leave their businesses, to attend the Annual Meeting in order to vote either for or against regulations.

Lastly, I would suggest to the members generally, who desire to support or oppose the or any regulations, that they should, amongst themselves, make arrangements for sending from every town in the kingdom, as many representatives as possible and convenient, so that the expression of opinion and feeling either for or against shall be such that the Council may be able, with reason and justice, to set before the Privy Council how great and general throughout the trade is the opposition to, or approval of, as the case may be, any interference with the mode in which any one thinks proper to arrange his shop or conduct his business.

I may venture, perhaps, to add that any supposition that there is a desire to inflict either a hardship or an annoyance is doubtless a misconception; whatever the Annual Meeting may decide upon, the Council of the Society, at least, as I understand the matter, is bound to receive.

A. F. HASELDEN.

Sir.—Probably it will be for the benefit of the Society that Mr. Sandford has terminated the attitude of watching to which he alludes, and has descended into the are naof discussion; and it is much fairer that we should meet upon such conditions.

There is internal evidence that a large part of the support given to the regulations has been given by the elected representatives of the Society writing anonymously, and it is impossible to overlook the evil results of this substitute for adequate publicity to the discussions of the Council. If gentlemen successfully oppose the admission of reporters to its meetings, they may be said to write their own condemnation when using the correspondence columns of the Journal for stating their opinions; but, at the least, it would be decorous to do this openly.

I must hold those who exclude reporters from our meetings as being the cause of my having twice to address you. I conceive that the members of the present Council risk being charged with a grave dereliction of duty by permitting the existing rights and privileges of the trade to be grievously shorn whilst in their custody; and, in a discussion of the whole question, it would have been for the general advantage could members of the Council have obtained categorical replies to the closest questions respecting past negotiations with Mr. Simon, etc.

But the opportunity of eliciting such information for public benefit is denied us, and, as a consequence, the present method is the alternative. Our representative duty of vigilance remains the same, and Mr. Sandford must blame himself and those colleagues who join him in excluding reporters, if he dislikes the only method left open for directing attention to points bearing on the whole question.

The position of the Society is unprecedented. Like Paris, it finds that its defences no longer present their front to its enemies, but the official armament is brought to threaten itself. At such a time, I cannot feel justified in a complaisant assumption that the action of a section of my colleagues is necessarily right, and if the negotiations of 1868 are advanced as the groundwork of the present regulations, I claim the right of considering those negotiations, and the situations of their participants, as matters of public interest. The Act of 1868 has been read by pharmacists all over the kingdom, who can find in clause 1 no warrant for the inflexible course insisted upon by Mr. Simon, Mr. Sandford and their supporters, as being without any alternative. If the terms of the asserted contract in clause 1 are considered, one of their essential principles is that the Society is the best judge of what regulations are desirable and proper, and it follows that it should decide this question without external pressure or threats. The objections made to the present proposals are not against their object, but are, firstly, to their construction and details, and, secondly, to the Government inspection and penal consequences which their adoption would entail.

Now, the Society is bound to regard these practical considerations quite as much as the literal interpretation of a dozen permissive words in an Act of Parliament.

The rights of chemists existed before 1868, and were not all bartered away then; whilst it is unquestionable that the evils that would follow the adoption of the present scheme would, from a State point of view, be infinitely worse than those which it sought to remedy.

The grotesque nature of Schedule A when adopted as a basis for storing remedies, and the wild uncertainty existing as to its boundaries, would lead to one of two things, either the cruel penalties of the Act would be inflicted for merely technical breaches of the law, or the regulations would become a dead letter, and disregard of other portions of the Act would be fostered.

There is one passage in the "Statement of Reasons" which perhaps deserves a bad pre-eminence over all others. It is that where the majority leave the policy which the *Chemist and Druggist* describes when it says the Council "has sufficient reason left to know that it may still hope for victory if it can only succeed in frightening its opponents." The appeal to fear is for the moment laid aside, and the already alarmed brother is soothed by this assurance, "*they* (the Council) *venture to say that no vexatious proceedings will be adopted to inquire into their observance.*" Well might Mr. Schacht suggest at a meeting at Bristol that he thought "compulsory regulations, which were not to be enforced, had better be called by their proper names, 'recommendations.'"

Here is a declaration—(is it based on a "tacit understanding between the Council and the Government"?)—solemnly put forward in the name of the Council. I cannot help asking, What does this mean? As eleven gentlemen endorsed the assertion, will not one of them tell us what are the grounds for so remarkable a promise? It is inconsistent with what we thought to be the opinions of some of "the eleven" when studying their anonymously-expressed views, to which I have already alluded.

Under the *nom de plume* hitherto used by a gentleman belonging to "the eleven," I lately read the following:—"*A more weighty objection, and the only weighty one that I can find, is this, that you introduce the thin edge of the wedge, which will lead to inspection and annoyance from public officers.*"

Are not "inspection and annoyance" to be considered *vexations* to a well-regulated mind and shop?

As our representatives give us two divergent statements, which are we to accept?

On the personal relations of the question to Mr. Sandford, I submit that I have not exceeded either right or propriety, and have kept strictly to the matter in hand.

Mr. Sandford's services to the Society have become a part of its history, and I need not here enlarge upon them, but my reply to the suggestion of inability to recognize these, is a reference to a certain meeting at Norwich, which will show who was the mover of the resolution ultimately developed into a lasting testimony of the grateful feelings of our body.

Mr. Sandford's remarks upon the question of leaders in the *Lancet* and *Pall Mall Gazette* are rather Palmerstonian in style, but do not rebut anything that I stated, and as the former of these journals has produced another article on the subject without giving us the threatened information about the earlier ones, I fear our further curiosity will be disappointed.

With reference to the article from the *British Medical Journal*, I have asked a friend to give notice of a motion on the subject at the April Meeting of the Council.

I am sure that many members of the Executive of the British Medical Association would not approve of the language used by their official organ. Whether the mode of advocacy of the Regulations by certain medical journals will make them more palatable to those for whom they have been prepared is somewhat doubtful, but the unblushing effrontery with which these writers ignore any idea of the experiment extending to themselves is quite amusing.

Probably no error ever developed into a system without having, as a basis, some half-truth. So it is in the present case. Give us, by a uniformity of arrangement, any better security against that chance of error which belongs to everything human, and we should all accept it gladly. But it happens that the conditions and consequences attached to the regulations have convinced the judgment of competent and unbiassed persons in every quarter, that the remedy is worse than the disease.

A few persons holding this opinion have been induced to acquiesce in what they take to be the necessity of the case, their judgment yielding to the threats which have been made, whilst in some quarters we have seen extreme sensitiveness, lest it should be supposed that individuals refused to adopt every suggestion that could be made for giving security against error.

More moral courage than this is requisite; and if we are true to ourselves and to our profession, we have nothing to fear.

In past years we have had to tell Parliament that its Poison Bills and Bills for the Prevention of Accidental Poisoning were delusive in their promised security, and impracticable in their working, and having a good conscience, we cared not if ignorant people charged us with indifference.

We are again put through a similar trial of our moral courage, although with aggravated circumstances.

If the opposition to the regulations arose from selfishness and ignorance, should we find the line of demarcation between the *pros* and *cons* such as it is at present?

Let the lists of those who have declared their opinions during the past two years answer this question.

RICHARD REYNOLDS.

Leeds, February 28th, 1871.

Sir,—In the early part of last July (I think) you inserted a letter from me, which was found fault with by one or two of your correspondents, because my name and address did not appear, although, of course, both had been sent to the editor, though not for publication.

"Quot homines, tot sententiæ." The arguments advanced on both sides received my candid consideration. There was, however, just this simple fact, I wrote to condemn systems and practices, and to point out what appeared to me as existing evils; but knowing that these were tolerably widespread, I did not wish to draw attention to any particular place, nor to particular individuals. And as then, so on the present occasion, the observations offered must stand on their own merits. My motives in writing are certainly of an unselfish character.

The following remarks are elicited by a circular received from the Secretary with reference to the storing and dispensing of poisons.

Now, I certainly thought the Council had taken great pains in making these proposed rules as little objectionable as possible, and was greatly surprised to find such an amount of opposition called forth by them. I hope to be pardoned for saying that personally I do not see any reason for this determined antagonism, nor have I been able to perceive much logical force in the arguments made use of to support it.

One of the stereotyped cries seems to be that hospitals and dispensaries required to be placed under regulation as much or more than the establishments of chemists and druggists. Now, were this anything to do with the matter under consideration, I might be able to say something upon the subject, having been several years chief dispenser at one of the London hospitals, besides being engaged at different times both in private and public dispensaries.

However, it seems to me that at present there are two points for deliberation, and two only.

Has the Government any right to impose regulations upon us? Are the regulations proposed, or any regulations, necessary?

The first question I do not feel disposed to argue. But as regards the second, I am disposed to think that some such regulations as those recommended by the Council are necessary, and that it is to our own interest to adopt such. They can (if carried out in a right spirit) be so arranged as to adapt themselves to the varied requirements of either large or small establishments, and the country will, sooner or later, demand some such concessions at our hands.

Few who know anything of trade arrangements generally will dispute the fact that practices such as the following are rather the rule than the exception:—Bottles and packages containing poisons, interspersed among others containing innocuous substances and non-poisonous preparations, and without any mark of distinction, beyond the ordinary label, to point out the dangerous contents. And whilst, on the one hand, the occurrence of comparatively so small a number of fatal accidents from misadventure may be taken to indicate the general care and attention paid to our duties, a careful inquiry into the causes of these fatal cases when they do occur generally points, on the other hand, to some little laxity in the arrangement or storing of goods, or to the want of some striking distinction in the bottles in which poisonous applications and non-poisonous medicines have been sent out.

Reflecting upon this sort of thing, I some time since adopted a plan almost identical with that proposed by the Council, and the arrangement has certainly added much to my comfort and peace of mind, for just before doing this a mistake occurred in my own shop (from want of this), which would, in all probability, have proved a fatal one had not the suspicions of the patient been aroused by noticing some difference in the medicine.

I am quite as great an advocate for sending out liniments, lotions, etc. in poison-bottles; and this, not only because I believe it may be often a means of preventing persons from getting hold of the wrong bottle, but because in two or three cases of fatal poisoning well known to me, the accident has arisen through the bottle being sent for a repetition of medicine, and instead of this a poisonous lotion had been dispensed.

It is true that persons will bring these bottles for sweet nitre, castor oil, etc., but we never find they object to exchange them for others, and we are rather the gainers than otherwise by so doing. Of course, if we be expected when a customer comes for two-pennyworth of laudanum and opodeldoc to give a poison-bottle in place of any old dirty bottle they may bring, we should be rather losers by the transactions. It will require some little consideration how to meet such cases. Probably a small strip of glass paper gummed to the bottle would answer all requirements.

There seems to be no difficulty in understanding the meaning wished to be conveyed by the Council in the following:—"But with reference to the obligations which the regulations would impose, they venture to say that no vexatious proceedings will be adopted to inquire into their observance." Of course, should any accident occur, it would most likely go much harder with those who shall not have complied with the regulations, and very justly so.

It is much to be desired that, instead of the Council meeting with vexatious opposition, they may have the support of the trade generally; for, although it may be true that no amount of regulations will altogether prevent accidents happening, still they must have a tendency in that direction, and the public will, I am sure, rightly value this guarantee from us that nothing is left undone by the trade that may conduce to their safety. And I most earnestly hope the Council will not by any pressure sought to be brought to bear upon them shrink from doing what they have, I think, wisely concluded to be their duty.

One who has known the Drug Trade more than Thirty Years.

Sir,—Your numerous correspondents show that the poison question is a very vexatious one. It appears to me that every M.P.S. has some good arrangement of his own, and no other will suit him as well as the one he adopts for his own establishment. This is the case with me: my plan is to keep acid. hydrocyanic., etc., in a distinct place, and for the ordinary shop bottles containing per. ant. tart., tr. camp. co., tr. nucis vomicæ, etc., I use, in addition to the ordinary label, one of Silverlock's registered labels, and this simple plan is in all points better for my purpose than any I have seen recommended. It is very plain any uniform system will disturb every plan now adopted, and be very likely to produce that confusion and those mistakes sought to be avoided. In reference to dispensing bottles containing outward applications, the application of sand-paper appears to me the best plan, if any is necessary, as the sign can be removed in case the bottle be used for anything else. The proposed particular-shaped bottle may be used for anything, and create rather than prevent accidents. It will be a great annoyance to have one's premises open to inspection, and this, I am sure, every member of the trade ought to protest against.

February 26th, 1871. M. P. S.

Sir,—That Mr. Brady, Mr. Reynolds and others are opposed to the poison regulations may be taken as sufficient evidence of the reasonableness of the opposition, and ought, I think, to make every one interested in the question pause before exchanging the liberty he now possesses of conducting his business in the way most agreeable to himself for a system by which he will be bound to conform to certain fixed rules.

The main argument of those who advocate the change is, that unless we acquiesce now, we shall, by-and-by, be compelled to submit to a more irksome code.

Such an argument is most humiliating, and is suited to any obstinate or tyrannical official who cares only for the carrying out of some pet scheme.

If on the merits of the question we believe the regulations unnecessary, let it be so avowed, and steps taken, as on former occasions, to resist any Government interference.

That part of the scheme which has reference to the storing or keeping of poisons I consider the most objectionable, inasmuch as it partakes in so great a degree of an inquisitorial character.

We do not admit that the public suffers by the existing method of keeping poisons. What, then, has the public, or Government on the part of the public, to do with our mode of keeping them? It may have a right to say how, or on what conditions, it will receive them, or under what restrictions they shall be circulated, but as to the keeping of poisons I submit that no case has been made out which would justify so objectionable an interference.

Bishopwearmouth, Sunderland. John R. Thompson.
February 27th, 1871.

Sir,—In view of the approaching Annual Meeting of our Society, when, if the logomachy be eager,—

"Collecti flores tunicis
Cecidere remissis."

—it should also be dignified and moderate; and having given a careful and dispassionate consideration to the Council's "statement," I think that reticence or neutrality would be untimely.

It is an axiom in military science, that no fortress is stronger than its weakest point. Now the "statement" possesses one feature of weakness. The resolution authorizing its issue had not an unanimous adoption; hence its intrinsic importance and influence are materially diminished.

Touching the proposed regulation,—any code would necessitate for its effectuation, a multitude of contributive and subsidiary conditions; which, while recognizing professional status and requirement, should not unduly interfere with or impede trade interests and convenience. The new Pharmacy Act, by raising the standard of qualification, insured to the public a security that no mere classified inventory of poison-bottles would have effected. For, without this pharmaceutical curriculum,

"'Tis still to be
Senseless to feel and with seal'd eyes to see."

Notwithstanding, no well-affected chemist will ignore those precautions which prudence and discretion dictate as proper and desirable safeguards.

Leeds, February 28th, 1871. Clement Pierson.

Sir,—Surely the Council of the Pharmaceutical Society cannot be so ill advised as to persist in their attempt to force the obnoxious poison regulations on the trade, now rendered doubly offensive by the addition of a clause to regulate the dispensing of poisons. The opposition already manifested does not, I believe, represent one-tenth of that which exists. Many, like myself, have been waiting in the hope of seeing some formal announcement that the Council had reconsidered their decision, and withdrawn the project. I would warn every chemist and druggist, ere it is too late, not to come under the rule of Mr. Simon and his medical colleagues. If they want to know how it will fare with them should such an unfortunate event ever happen, they have only to look at the tyrannical and despotic manner in which Mr. Simon rules over boards of guardians in the matter of the Compulsory Vaccination Acts. All their individuality of action is gone, and they are mere tools in his hands. *Ab uno disce omnes.*

As to the remarks of the *British Medical Journal*, quoted on page 687 of your last number, they are so insulting to us as a body that I think the Council ought immediately to publish an indignant remonstrance, and let the accredited organs of the medical profession know, in unmistakable terms, that we neither covet their praises nor fear their censure.

Harrow Road, W., Feb. 28th, 1871. WM. YOUNG.

Sir,—In your editorial footnote appended to my letter of last week, you exercise a freedom of inference which I venture to assert is not warranted by any of my remarks. I never said the regulations "should not be adopted, because medical men neglected them," and no part of my letter will bear any such construction. What I said, and what I now reiterate, is, that the proposed regulations evince a disregard for the public safety, and that the position of our Council, in reference to them, shows a want of good faith towards the trade and its interests.

The position I take is that, so far as chemists are concerned, these regulations are not required, inasmuch as every precaution is already adopted; and that to disturb the systematic arrangements now in use, and which are especially adapted to the requirements of each individual establishment, will be fraught with stupendous difficulties to the trade, and positive danger to the public. On the other hand, the so-called surgeries of medical men are, as a rule, so ill fitted, so ill kept, and so scantily-provided with anything like safeguards against accidents, that coercion might very advantageously be applied to them in the interests of society. How very absurd, then, or even something worse, must appear the attempt to legislate for the former whilst overlooking the latter! Chemists will do well to remember that the whole scope and tendency of the "poison clauses" of the last Pharmacy Act have not been towards the preventing of poisoning, but was directed mainly against counter-prescribing. They will also do well to remember who were the instigators of these clauses.

CHEMIST.

[*** Our correspondent errs in supposing we attributed to him any enunciation of the argument we spoke of as fallacious. But since two-thirds of his letter was devoted to comments on the need for poison regulations in surgeries, and on the injustice of surgeries being exempted from the application of the proposed regulations, it seemed to us a fitting opportunity to refer to these opinions as being—whether right or wrong—altogether foreign to the discussion of the present pharmaceutical question, for we believe that will be an advantage if the discussion be kept within its proper limits.—ED. PHARM. JOURN.]

Sir,—Though much has been said about voting-papers in the matter of the new poison regulations, I have not heard anything of our power of voting by "proxy," a form of which I here enclose, and which, it appears to me, should give me that proper and legal influence on the decision of the meeting which is my right; because, though I intend to be at the Annual Meeting, yet it may be so full that I cannot get in; and when I get there, if there is anything like a repetition of the uproar which we had last year, it will be a disgrace to us as debaters.

Now, what could be more simple than one page of the PHARMACEUTICAL JOURNAL filled with a form of proxy, which Journal, being posted, as it is, to all members, each one would be at liberty to stamp with a 1*d*. Inland Revenue (a receipt stamp), name his proxy, and return it to the Secretary at a cost of 1½*d*.? So that there could be a full debate, and a clear expression of the feeling of the members; and if the votes were registered according to the number of proxies, a peaceable and gentlemanly solution of the difficulty could be arrived at, which would not put the country members to the great expense and trouble of a journey to town.

A resolution in accordance with this plan was passed last night at the General Meeting of Chemists in Manchester; and if you would be good enough to print along with this a form of proxy suitable for the case, a full and timely consideration can be taken of its utility.

7, *Lower Hillgate, Stockport,* THOMAS KAY.
February 23rd, 1871.

[*** Voting in the manner suggested by our correspondent would be invalid, since the Charter of Incorporation specified, "That at all general meetings and meetings of the Council, the majority of the Members present having a right to vote thereat respectively, shall decide upon the matters propounded to such meetings, the person presiding therein having, in case of an equality of numbers, a second or casting vote."—ED. PHARM. JOURN.]

HYDRATE OF CHLORAL.

Sir,—Since the publication of the paper upon chloral, etc., in your issue of the 7th ultimo, I have found some of the data there given to be inaccurate; I therefore wish to made this statement public in justice to all of those interested.

My analyses were conducted in good faith; but at that time, as at present, the mode of testing hydrate of chloral was only imperfectly understood; therefore, I was liable to inaccuracies which I have since discovered by repeated experiments upon some of the identical samples.

In using the ammonia test, I would suggest that half the quantity of hydrate of chloral (viz. 250 grains) be treated exactly as prescribed by Mr. Umney; immediately the ammonia is added, well secure the aperture of the tube, agitate the liquid freely and immerse the tube in warm water (the temperature not to exceed 100° F.); when quite cold, read the chloroform layer; in this way coinciding results may be obtained.

My paper upon this subject has called attention to a most important question; already some makers have been improving their manufacture, and I do not doubt great good will accrue to all from ventilation of the subject.

I wish to thank those who have so kindly assisted my endeavour to arrive at truth in this matter.

ALFRED H. MASON.
Liverpool, February 22nd, 1871.

Sir,—Mr. Mason hints that in several of the samples referred to in his paper, alcoholate was substituted for hydrate of chloral; yet this can hardly be correct, for while he states that alcoholate is soluble in cold chloroform, he admits that all those samples were insoluble in that menstruum. What, then, is this body possessing such a definite composition as always to yield identical analytical results? Clearly not hydrate of chloral, for it only yields 57 per cent. of chloroform, and as clearly not alcoholate, because it is insoluble in cold chloroform. I hope that Mr. Mason is following up his inquiries, and that we shall shortly learn the true nature of this hitherto unknown compound.*

The subject was evidently of so much interest that I have been induced to make some experiments on my own account, the results of which I propose to lay before your readers. After making several trials, I have come to the conclusion that caustic potash is, on the whole, more trustworthy as a means of separating the chloroform than caustic ammonia. It does not require the application of heat, and I have, at all events, been able to obtain more constant results in this way. Thinking that the sample obtained by Mr. Mason from my firm might possibly have been exceptional, I have examined samples taken out of five different batches; they were all in cake (the only form in which I have yet made hydrate of chloral) and perfectly dry. I may mention here that I have frequently seen it stated that hydrate of chloral is deliquescent, and this statement is repeated in an editorial article in the PHARM. JOURN. of February 11. According to my experience, pure hydrate of chloral is not in any way deliquescent. I have frequently found that the hydrate made at our works has become damp, and even run to a liquid after long exposure, but I have rejected it as an impure article when it

* Mr. Mason's letter will probably be the best answer to this question.—ED. PHARM. JOURN.

possesses this property; and I have generally found that redistillation of a deliquescent article (rejecting the last portions that come over) produces a perfectly non-deliquescent cake. I have not as yet been able to determine the precise cause of this deliquescence, but I consider it to be due to some impurity of a higher boiling-point than the pure hydrate. At any rate I have always found that the last portions which come over are the most prone to absorb moisture.

The following table will speak for itself:—

Theoretical quantity of chloroform from pure hydrate chloral, 72·20 *per cent.*

Theoretical quantity of chloroform from pure alcoholate chloral, 61·75 *per cent.*

		Boiling point.	Chloroform present.
Dunn, Squire and Co. . . .	A cake .	97°	70·5
" " " . . .	B " .	97°	69·5
" " " . . .	C " .	96°	71·5
" " " . . .	D " .	97°	71·0
" " " . . .	E " .	97°	70·5
Von Martius and Mendelsohn	crystal .	97°	71·0
" "	powder .	96°	71·5
" "	cake . .	97°	70·5
De Haen	cake . .	97°	70·0
Saame	" . .	96°	70.5

I gather from these results that there is little or no practical difference in quality of the principal makes of hydrate of chloral, and that the alarm caused by Mr. Mason's paper is entirely unfounded.

That Mr. Mason conducted his experiments with care I can well believe, but if so, there must have been some error. As he does not describe his method in detail, I am unable to criticize it; but it is at least remarkable that it gave perfectly satisfactory results in the case of the so-called guaranteed article which he has taken under his protection, while it failed altogether when applied to the other makes. As he has raised the question of the fraudulent substitution of alcoholate for hydrate, I thought it worth while to inquire how far such a case was probable. I have therefore prepared some considerable quantity of the alcoholate as an experiment, and I find that it is somewhat more costly to make than the hydrate. The process employed for preparing hydrate of chloral must effectually remove every trace of alcohol from it; and even if this were not necessarily the case, the interest of the manufacturer would lead him to supply the hydrate rather than the alcoholate.

W. Stevens Squire, Ph.D.

Langthorne Chemical Works, Stratford, Feb. 14th, 1871.

In further reference to this subject, Messrs. Domeier and Co. desire to state that the sample, No. 8, examined by Mr. Mason, as representing the manufacture of Messrs. De Haen, has been found on re-examination to yield 64·37 per cent. of chloroform, whereas Mr. Mason's original result indicated a yield of only 55·6. They add that the result of this discussion clearly shows that the manufacture of Messrs. De Haen is really what it is represented to be, pure hydrate of chloral, and they express their gratitude to Mr. Mason for having assisted to establish this fact.

Messrs. Schœtensack desire to state that the chloral hydrate manufactured by Saame, of Göttingen, has been examined for them by Mr. K. Müller, who objects to the ammonia test, and adopted in preference treatment with solution of caustic potash (without heat). In this way he has found the chloral hydrate made by Saame to yield 71·4 to 71·9 per cent. of chloroform. These results, as we have already stated, have been certified by Professor Wöhler.

Messrs. Gehe and Co., of Dresden, object to Mr. Mason's result (No. 9) as not possessing any value until he has shown from what stock, and in what manner the sample in question was obtained.

Irish Pharmacy.

Sir,—Some time ago you called attention to the change proposed to be effected in the law regulating pharmacy in Ireland, and invited correspondents interested in the matter to express their opinions thereon. As an Irish apothecary who confines himself, like many others, exclusively to the business of the pharmaceutical chemist, I wish as briefly as possible to express my opinion of the proposed change. As you state in your article of January 28th, "a chemist and druggist is allowed to vend drugs to any extent, but is absolutely prohibited, under fear of a heavy penalty, from making up a single prescription." This has been the law for nearly a century; and I met the difficulty at once, in common with many others, by becoming an apothecary before commencing business. Some gentlemen who had been in business for years, I have known to attend their classes and obtain the necessary qualification.

I believe that the apothecaries would have no objection whatever to admit the pharmaceutical chemists (by examination) to all the privileges, as regards pharmacy, which they themselves enjoy, and I would wish to see a pharmaceutical society for Ireland; but I decidedly do object to any alteration in the law by which an inferior class of men would be permitted to dispense medicine in this country. The druggists at present in existence have no right to complain; they entered the trade with all the advantages and disadvantages it at present possesses, and they cannot reasonably expect to be placed on a footing with men who have spent much time and money in procuring the necessary qualification.

The medical men in Ireland have gradually given up compounding their own prescriptions, owing in a great measure to the efficiency of the apothecaries; but I believe that the inevitable result of a radical change, by which druggists, under a modified examination, might be admitted to perform the duties of dispensers, would be to force the profession to compound their own prescriptions, lest they might be taken by their patients to incompetent persons.

In England all your recent endeavours have been to raise the status of the druggist, and I have gladly seen the different steps taken by the Pharmaceutical Society in this direction, but I would earnestly deprecate the retrograde movement contemplated in this country.

The great difference between the two countries is, that while in England any person so disposed could sell drugs and compound medicines, in Ireland, while any incompetent person might do the former he could not do the latter. This, I think, most persons will admit to be an advantage to the people of this country.

In conclusion, I would wish to see a Bill passed by which the Irish apothecary, or pharmaceutical chemist if you will, should—without studying medicine or surgery—be compelled to be thoroughly well educated in botany, chemistry, materia medica and all things relating to his business. To this, I think, no English chemist or Irish druggist ought to object.

Aliquis.

E. Raynor (Durham).—*Modified Examination.*—Candidates will be required to read autograph prescriptions, translate them into English, render a correct translation of the directions for use, and detect unusual doses. To weigh, measure, and compound medicines, write the directions in suitable language, finish and properly direct each package. To recognize the Pharmacopœia chemicals in frequent demand, and specimens of roots, barks, leaves, fruits, resins, and gums in ordinary use; the following plants, either in a fresh or dried state, or from plates:—belladonna, stramonium, hyoscyamus, conium, aconitum, digitalis, and sabina; also to estimate the quality of each specimen submitted and its freedom from adulteration. To recognize the preparations of the Pharmacopœia which are not of a definite chemical nature, such as extracts, tinctures, and powders, and give the proportions of the more active ingredients.

[*** Capability of passing this examination would probably be acquired better and more readily by cultivating the ordinary faculties of observation than by any kind of books. For that the every-day experience of a well-regulated pharmacy ought to afford ample opportunity.—Ed. Pharm. Journ.]

Lux.—Yes.

W. Lea (Dorchester).—Recipes for making Brilliantine will be found on p. 437.

W. W. (Exeter).—Passing the Minor Examination is sufficient qualification for entering business on your own account as a Chemist and Druggist, but not as a Pharmaceutical Chemist.

Communications, Letters, etc., have been received from Mr. J. Ince, Mr. W. Southall, Mr. C. A. Staples, Mr. J. Noad, Mr. W. Hills, Mr. W. Hartley, Mr. J. Birt, Mr. C. Ekin, Mr. C. Pierson, G. W., F. O., H. R. H., W. H. P., E. W., "A Medical Assistant," "Conservo," "Iodi," "Old Student," "Farina," "Sincarf."

THE MICROSCOPE AND ITS REVELATIONS.*

BY W. B. CARPENTER, M.D., F.R.S., F.G.S., F.L.S.

When I last had the pleasure of addressing you, I directed your attention to some of those lowest and simplest forms of Animal life which have of late years been very much the subject of observation amongst Naturalists, and the study of which has added, I think I may say, a great deal to the science of General Physiology, because it has led us to perceive that some of the most important functions of life in the higher animals are really performed by the protoplasmic substance which enters very largely into the composition of their bodies, and which, as it were, prepares the material that is turned to higher account in the more complicated structure of those organisms that we are accustomed to call superior. Let me dwell for a moment on what we mean by superior and inferior organisms. By superior we mean those in which there is the greatest division of labour, in which the work is most highly specialized, in which there is a particular apparatus for each function, and in which that apparatus is carried to its highest degree of perfection. Why do we call the hand a superior instrument to the corresponding extremity of any of the lower animals, even the most highly organized apes? Because it is much more highly specialized. We do not use it for support or progression; it is entirely used with us for prehension, for laying hold of things. We can oppose the thumb to every individual finger, but an ape cannot; he can only take hold with his whole hand, and he uses his anterior as well as his posterior extremities for support and progression. That is one instance of what we mean by specialization. I showed you on the last occasion that a simple particle of animal jelly lays hold of food by drawing it in to itself without a mouth, and extemporizes, so to speak, a stomach; that without any proper mouth, and without any proper stomach, it performs the function of digestion; that the material imbedded in it is dissolved by its means, and converted into the same protoplasm; that it has also in itself the power of motion; and again, that if it has any power of feeling, this must be diffused throughout the same protoplasm. But this protoplasm in us is simply the preparative material for all that wonderful mechanism which, with us, as in all higher animals, is made subservient to those much more highly specialized and complicated functions which man is capable of performing, and which all minister in the end to the maintenance of his conscious life, his intellectual power, his moral feeling and so on.

This evening it is my purpose to carry you into a slightly different field—into that domain of life in which we have active motion, and in which we have again the curious phenomena of motion in plants;—to carry you, in fact, into the domain which has been the field of great perplexity to naturalists, but which is gradually becoming, by the careful study which has been bestowed upon it, more and better understood.

When I began to devote myself to the application of the microscope to the study of the lower forms of plants and animals, it was believed, with very few exceptions, that everything which has motion must be an Animal. An old observer, Vaucher, of Geneva, had directed attention to the fact that little particles issue from some of those green threads that you see in running streams, the *Confervæ*, which particles, he said, were animals in a very early stage of existence, and that they then returned again to the form of plants. He said they were animals, because they had the power of motion. He watched them very carefully with the imperfect instrument he had, and he found that the motion gradually subsided; they settled down, and then began to develope into undoubted plants. Here is a diagram of one of the plants which Vaucher observed; it is known as *Vaucheria clavata*,—the club-shaped *Vaucheria*,—from the tendency of its ends to swell into these club-shaped masses. It is just one of those green, thread-like plants that you will see in running streams, very often attached, for instance, to the stones where water is running over a mill-dam. When it is in its ordinary growing condition it is simply a filament; but when it is going to put forth one of those curious buds, so to speak, it swells into a knob, and there is an accumulation of green matter in the extremity. This separates itself from the green matter in the tube, and by-and-by it is seen that this green knob has a distinct envelope of a greater thickness than the proper wall of the tube. Then the covering bursts, and from the interior of the tube there issues forth this body, which is known by the name of the *zoospore*. The term spore is given to the reproductive particles of the lower plants as distinguished from the seeds of the higher. The seeds, you know, contain with the germ or embryo a store of nourishment, laid up either in the cotyledons when fleshy, as in the pea or bean, or in the albumen when the seed is albuminous, as in wheat and many other plants. In either case that store is applied to the nutrition of the embryo before it is sufficiently developed to obtain its own nourishment, to get its own bread, as it were. Now, in the cryptogamic tribes generally we find that these minute particles are launched forth upon the world with a power of getting their own bread at a much earlier period, and therefore there is not in them the same store of nourishment that is supplied to the higher plants. The word *spore* is applied to things really very different, of which I shall give you an illustration by-and-by. You are not to suppose that the spore always represents the seed of the higher plants. In this case the spore is a sort of little bud, and it is called a zoospore, from the fact of its having a power of motion very much like animal motion,—*zoon* meaning animal, and zoospore, a spore endowed with power of motion like an animal. This little bud, with a rather thick casing, issues forth from the end of the tube, which bursts and gives it out. Then it takes a spherical form, and then, after a little time, it is seen to be in active motion, and this active motion is given to it by the vibration of a fringe of minute hair-like processes, which are termed *cilia*. These are the active agents of movement in the lower plants, in the lower animals, and in various parts of our own bodies. (For instance, the whole surface of the respiratory tract, as it is called, all the mucous membrane of the air-passages down to the air-cells of the lungs, is covered with these cilia.) By the action of these cilia forming this fringe, this little particle is carried about in the water, and thus the large number that issue from the various filaments of the plant are dispersed, and carried to new localities. After a

* Lecture delivered at the Evening Meeting of the Pharmaceutical Society of Great Britain, March 1, 1871. See *ante*, p. 641.

time the ciliary motion ceases, and then the bud settles down, and begins to extend itself into filaments, and thus becomes a plant like that from which it proceeded.

This is not the result of a true generative process, as the seed is; it is more like a bud. There are various plants that throw off buds by the process that we call *gemmation;* and this is a process of gemmation or budding, not a process of true sexual generation. The *Vaucheria* was observed in the last century by Vaucher, and he ascribed this power of motion to animal life, and considered that here was a curious passage from vegetable to animal, and then back again from animal to vegetable. That, however, we now understand not to be the case. This ciliary motion is not a phenomenon at all peculiar to animals: there is no question that a very large number of bodies that have been described as animalcules are truly plants, and the tendency now is continually to carry into the Vegetable kingdom additional tribes of these bodies that have been called animalcules, rather than to extend the Animal kingdom to comprehend those new and varied forms that are continually being discovered.

You may ask me what is the difference between an Animal and a Plant, and we may well stop a moment to notice what I believe to be the true physiological distinction between them; namely, that the Animal is essentially dependent upon previous plant life for its nutrition, having no power of living upon the elementary substances contained in the air, the water, or the soil. It has no power to combine these with itself, but is dependent entirely on organic compounds which have been previously prepared and combined by the plant. On the other hand, that the Plant has the power, especially, and indeed almost solely, under the influence of light, of decomposing the carbonic acid of the air, of uniting the carbon which it obtains from the air with the oxygen and hydrogen of water, and also of decomposing the ammonia of the air and of the soil (for the air always contains a small quantity of ammonia), and of uniting the nitrogen of that ammonia with the oxygen, hydrogen and carbon that it obtains from the air and water, to form nitrogenous compounds. Thus the plant is continually manufacturing, so to speak, these compounds, and the animal is continually destroying them, and returning them to the inorganic kingdom, because the whole life of the animal is one of decomposition. The animal is constantly giving back to the mineral kingdom—in the carbonic acid of respiration, and in the production of urea and similar compounds in the urine, which decompose into carbonate of ammonia—the very same component elements which it has obtained from the vegetable kingdom, and which the vegetable has taken from the mineral. This is represented here in a circular diagram, where you see the Vegetable kingdom drawing its materials from the Mineral kingdom, combining them into organic compounds, and then imparting them to the Animal kingdom, which in its turn from the decompositions which are always going on in its body, returns them to the Mineral kingdom. That is the physiological distinction, and that, I believe, is the only one on which we can rest with any degree of satisfaction; and even this does not always hold good, for there is one very limited tribe of plants, which a chemist would say ought really to be placed in the animal kingdom, and yet the resemblance to undoubted vegetables is so close that it would be a breach of all natural arrangement to separate them. I allude to the group of Fungi. None of you would feel that there was a fitness in describing a mushroom as an animal, and yet as regards nutrition it is an animal. The group of *fungi* is a group living upon organic compounds previously prepared, and light is not essential to them; many thrive best in darkness. In fact, in the common mushroom it is only the fructification, the upward extension of a growth that is taking place under ground, that appears above the soil. The real nutritive life in the mushroom is performed beneath the ground; what it pushes up is simply the fructification. In the early stage of the mushroom—what is known as the mushroom spawn, when it is laid down to produce the mushroom—the growth of what is called a *byssus*, a long filamentous growth, takes place best in darkness. In old cellars where wine has been laid down a long time, there is often a most extraordinary fungous growth; and underneath paving-stones, again, there is often a fungous growth, which has been known to lift up the stones; and all that takes place in darkness. There is no question that fungi as a rule thrive best in darkness up to the time when they put forth their fructification, and that they appropriate, and have a most peculiar power of appropriating, decomposing organic matter, supplied either by the vegetable or the animal kingdom. You all know the appearance of the growth of mould, which often takes place on preserves, on chemical preparations, extracts, and so forth; and the mould that produces the blueness of Stilton cheese. All these cases show you the readiness with which mould developes itself on substances which are either decaying or ready to decay. And this mould, produced from germs of fungi sown as it were upon such substances, helps their decay. This is a very important and very interesting point, upon which I wish to fix your attention for a few minutes, viz. this peculiar habit of the fungi, and the changes to which it leads. We have heard a great deal lately about disease germs, but I venture to say that Professor Tyndall's lecture, although extremely interesting, and although presenting to the eye, and, so to speak, demonstrating their presence by the beam of electric light which he was able to send through an atmosphere containing such germs, really added nothing to the knowledge previously possessed by naturalists, because we all knew perfectly well that the air is loaded with these germs of fungi. If you take a puff-ball and press it between your finger and thumb, you will see the fine dust that issues forth, and which is carried by the winds into every quarter; for a puff-ball consists of a number of germs or sporules which is really scarcely capable of being expressed in figures. If we measure these, and then consider the size of the whole mass of a large puff-ball, with reference to the size of any one of these minute particles, we can form an approximate calculation of the number of particles contained in it, and it is something almost inconceivable by any effort of our imagination, and almost incapable of being expressed in figures, like the great distances of the stars. Thus you see that these particles must be continually being diffused through the atmosphere in every direction. That is only one case out of multitudes.

Now, with regard to the demonstration of this universal diffusion, many years ago a friend of mine in Bristol made the following experiment, which I mentioned to Dr. Tyndall, and which he was very glad to hear of, as it offered a complete demonstration, by a different process, of the facts which he was wishing to prove. The gentleman I refer to, Dr. Brittan, at a time when cholera was prevalent, employed a man to blow with a pair of bellows for several hours in a room in a low dirty neighbourhood. The bellows were connected with a siphon, and the bend of the siphon was immersed in a freezing mixture. The air had moisture in it, which was condensed as it passed through the cold tube, and carried down with it the floating particles contained in the air. Dr. Brittan sent me a specimen of this to examine, and the fluid was quite brown with the quantity of sporules of fungi which it contained. Yet this was simply the natural moisture of the air condensed. To give another illustration. About the same time my friend Mr. John Marshall was led to pay a great deal of attention to the prevalence of smut and rust in wheat. It was a year after a very bad season, when there had been a great deal of unhealthiness in the wheat grains, and there was a large quantity of bad bread sold, especially among the poorer classes. It was at a time when there was an epidemic of cholera, and there was a notion that this disease was due to the presence of these germs of fungi. Mr. Marshall formed the idea that the presence of these germs in the evacuations was simply due to the patients having eaten bad bread, and he examined through the microscope a great many specimens of this inferior bread. He found that all the inferior bakers were selling bread that contained a quantity of these sporules of fungi. Then he got a number of samples of flour, and found that whilst the inferior flour contained an enormous quantity, even the best flour, with a very few exceptions, contained some. Then he traced it further back to the wheat grains. He got a number of samples from different dealers, and found that almost every grain had entangled amongst the hairs at the point of the grain two or three or more sporules of fungi. That shows the universality of their diffusion, and it added great strength to an opinion I had been previously led to entertain, that the prevalence of these diseases in particular years depends upon the general unhealthy condition of the grain, predisposing it to decomposition; and that the sporules alighting upon a healthy surface will not grow, whilst again, alighting upon a grain already unhealthy, the fluids of which are prone to decomposition, the sporules find an appropriate bed, and begin to vegetate, and then their increase spoils the whole grain very rapidly. Take again the case of a disease that many of you have heard a great deal about—diphtheria. One of the first signs of diphtheria is almost invariably the presence of the diphtheritic crust, as it is called, upon the fauces; and that diphtheritic crust, when examined with the microscope, is found to be almost entirely a fungous growth. But I do not believe at all that the fungous growth is the origin or essence of the disease. It is simply this, that there is a peculiar unhealthy secretion thrown out, which becomes the *nidus*, the bed for the development of these fungous germs, which are constantly floating about. In the same way with the vine disease and the potato disease. I do not believe in either case that the fungus is the first cause of the disease, but that in both instances it is a predisposition to an unhealthy condition of the plant, in consequence of bad cultivation, forcing cultivation especially, which gives to the fungus its power of development. This peculiar power that fungi have of decomposing organic substances is again manifested in the phenomena of ordinary fermentation. Ordinary yeast, which is a substance familiar to you all, is a mass of vegetation. This discovery was made about twenty-five years ago, I think; and I had the pleasure of being the first to satisfy Professor Liebig, (who was at that time in England, and who scouted the idea that fungi had anything to do with vegetation,) that these were unquestionably organic bodies, and thus led him to be more tolerant in his views and in his expressions with regard to those who maintained, as is now universally admitted, that it is the presence of these fungi, and their peculiar power of inducing decomposition, which is really the cause of fermentation. If you can shut out these fungi, for example, in the treatment of an abscess communicating with the air, or of a compound fracture, (and this is one of the greatest improvements of modern surgery,)—if you can shut out these, by the use of carbolic acid or other means; if you can filter the air of these germs of fungi, and protect the cavity of the abscess or the compound fracture, like an entirely internal cavity, instead of allowing it to communicate with the air,—you then promote very considerably indeed the patient's welfare, and give him a very much better chance of recovery. You thus see how one thing leads on to another, and how important improvements in medical practice arise out of a knowledge of the conditions of these low forms of vegetation.

Yeast is composed of a mass of cells which, during the process of fermentation, grow from single cells, putting out little buds, until a single cell grows to four, five or six. By the time that they have formed these little groups of five or six cells, the fermentation has advanced sufficiently far, and it is stopped; but, if it were allowed to go on, it would then put forth a fructification, and become a regular well-known form of fungus, very much like that which you find in old vinegar. Again: there are other forms of fungi which grow in the silkworm, and constitute one form of silkworm disease, which has been extremely fatal in silk-growing countries; in fact, it is said that it has produced losses to the extent of thirty or forty millions sterling, and yet all this arises from a minute fungus, which is developed in the interior of the body of the animal.

I have dwelt upon this subject of the peculiarity of Fungi in relation to the general doctrine of the distinction between animal and vegetable life, because it is a subject of great interest at the present time, and has an important relation to those duties of medical men with which you are likely to become very familiar.

I return now to the point from which we started, the active motion that we find in many of the lower Plants. This motion you may see extremely well if you happen to be anywhere on the seacoast, and take up what you find growing there on the shore, those long, green seaweeds called *Ulvæ;* some of them narrowed very much like blades of grass, and some having large, extended surfaces. In the summer time you will be almost sure to find some of these white at the ends and over a very considerable portion of the edge, perhaps for a third of its length. That white portion is the part of the frond which has discharged its zoospores. All that white portion was once green. The green cells were then filled with green matter congregated into little masses, and by the rupture of the cell they escaped in the form of zoospores. If you take a piece of this sea-weed, and put just the edge where the green and white join under the microscope, you will see the spectacle that astonished me some thirty years ago, when I believe no one else in this country had observed it. An eminent Swedish naturalist had observed it, but I believe I was the first to see that very wonderful spectacle in England. It was really like a swarm of bees,—the multitude of these minute particles that had issued forth in active motion from the cells, and were issuing forth, for I saw them actually coming out from the cells just on the border of the white or empty portion. That is one of the most familiar phenomena that may be observed on the seacoast, and there are many fresh-water *Confervæ* which show you precisely the same.

This motion, then, is a very common phenomenon amongst the lower Plants; and when we once come to appreciate that, we see that it is really the key to the interpretation of a great many other phenomena which had been previously wrongly viewed. For instance, I have here a representation of a favourite object with microscopists, which was called, long after I began the study, the globe animalcule, or *Volvox globata.* They are some of the most beautiful things that can be seen under the microscope, and consist of globular bodies, rolling on and on, turning on their axes, swimming through the water, and studded all over with beautiful little green points; and they very commonly have in their interior other green globular masses. It may surprise you to be told that this is unquestionably a Plant. We can now trace those as the highest, the most specialized forms of a tribe of plants which shows itself in various grades of simplicity, from the single little green cells with one or two vibrating filaments, by the agitation of which it moves, up to a form as complicated as the one here represented. Here are diagrams of some of the less complicated forms, but you will easily see that they differ only in form and not in essential organization, because it is the single cell and its vibrating filament which is the essence of the whole thing in every case. We find that these spheres in the interior are younger bodies of the same kind. One of these little cells buds by the process of cell-multiplication, and forms a little group or cluster; that group becomes a larger mass, and that mass, still with the cells closely packed together, forms a sphere which may often be seen revolving in the interior of the parent sphere. This, again, is not a process of sexual generation, but of gemmation. There is a distinct process of sexual generation, into which time does not permit of my entering to-night. The parent sphere bursts and sets free the contained globes; and each of these is changed, by the formation of a sort of glassy, transparent sphere, which developes itself between the separate green cells, from a green opaque sphere into a large transparent sphere. Here are representations of a number of different forms of this low tribe of plants, all distinguished by their red or green colour. You may ask how do we know that they are plants? We find that they decompose carbonic acid under the influence of sunlight. The great distinction which separates them from the Animalcules which they much resemble, is that all true Animalcules feed upon other animalcules or upon plants. By this distinction we can draw the line pretty sharply except in such perplexing cases as that of the fungi, which seem to unite the attributes of both kingdoms.

To give you an illustration of the dependence of one kingdom upon the other, I may mention a circumstance that happened to myself some twenty-five years ago. I was then living in the neighbourhood of Stoke Newington, and attached to the house in which I was residing there was a cistern that I could look in upon from my staircase window; it was quite open at the top and was filled with rain water. This cistern had become foul from leaves dropping into it, and early in the summer it had been cleaned out. A short time afterwards it was filled by a heavy thunderstorm, and in a few days, going up and down stairs, I noticed that it had a green scum upon the surface, and that this green scum came to the surface when the sun was shining upon it, but that at other times it was not to be seen. On examining some of this, I found it to consist of minute separate cells, with a couple of little tails, so to speak, which were long *cilia*, and these were in active motion. Now at that time the doctrine of Ehrenberg had undisputed sway, and not one of us young naturalists would venture to question the dicta of so great a man. I myself, however, in my own mind had come to entertain a very strong opinion, indeed, that these must be Plants, notwithstanding their active motion. And a very curious circumstance followed, which illustrated the relation of the Vegetable to the Animal kingdom remarkably well. There soon appeared in the cistern a quantity of Wheel Animalcules, creatures of extremely high organization in comparison with some of the lower forms. They fed most greedily upon these little plants; and it was, in fact, a great amusement to myself and friends to take out a few of these wheel animalcules, keep them in pure water for a day or two, to starve them, and then to put in a drop of water from the scum of the cistern loaded with these green cells. The eagerness with which they gulped it down was something only to be paralleled in recent times by the eagerness of the starving population of Paris when food was supplied to them. Here then you see, first the Inorganic material,—the water,—contained in a clean cistern, filled up at once by a sudden shower; from the oxygen and hydrogen of the water, and from the carbonic acid of the air, and from the minute quantity of nitrogen contained in the ammonia which is always found in rain water, the plant manufactured its materials, so to speak. The germ of the Plant, conveyed no doubt by the wind, or brought down by the rain, manufactured the materials, and developed into this enormous mass of vegetation. When that mass of vegetation had been produced, then the Wheel Animalcules, also brought by the wind,—for they are capable of being dried up completely, not only the eggs but the wheel animalcules themselves being capable of surviving the most complete desiccation,—dropped into the cistern, and found such a copious store of food and also of warmth, that they developed themselves very rapidly, and both by gemmation and by the production of eggs would multiply at an extraordinary rate. After a time, in fact, they seem to have killed out the plants upon which they lived, for I found that both plants and animalcules underwent a rapid diminution, so that in about a month afterwards they were scarcely to be found.

Before leaving this last tribe of plants I would mention to you that we now include in that group of lowest plants, the Protophytes, those very beautiful forms which are known as the *Diatomaceæ*. These diatoms are distinguished as having a siliceous envelope; they form, cell by cell, a deposit of silex, which often has markings of the most extraordinary beauty; and the variety of these diatoms, and the extraordinary beauty and delicacy of their organization, make them favourite objects of study with microscopists. Then again, there is one point in their structure which has been of very great value to microscopists, viz. that they furnish some of our very best test objects. Now the finding of a really good test object is a matter of very great importance in the breeding, if I may use the expression, of the best object-glasses; for our manufacturers set themselves to the improvement of object-glasses, just as breeders do to the improvement of racehorses or prize oxen or pigs. Their object is to produce the best glasses, just as a man tries to fatten a prize ox in the shortest possible space of time. The manufacturers of microscopes set themselves to make lenses that shall show certain test diatoms either better than any other lenses or with a lower magnifying power. Now, there is one thing that I must put you on your guard against, and that is the tendency to producing diatom-resolvers, so to speak,—lenses that shall best resolve diatoms; but this deteriorates to a certain degree from the production of lenses that are most useful in actual physiological research. This is a doctrine I have been preaching for many years, and I now find it is generally accepted,—that the lenses which are best for resolving diatoms in virtue of their wide angle of aperture are not, generally speaking, the best for ordinary physiological work. Therefore, if you are going in for a microscope and for getting the higher class of lenses, you should always consider what you want; if you are going to study these diatoms, then you must get lenses of particular qualities, just as if you want to hunt or ride races you must have horses that are of different qualities from those you would use as ordinary carriage horses. This is a point not sufficiently understood, and there is a great tendency amongst our makers to meet the wishes of those who desire these special lenses to resolve special diatoms, and to work them up so as to get out of a particular power results that really ought not to be expected from it. Every power, in my opinion, has its own particular attributes, and to attempt to make a lower power do the work of a higher is a great mistake. Every power should be adapted to do the best work of its kind, to do in the best manner the work for which it is properly suited. That will be found to be the case with well-corrected lenses of comparatively small angle of aperture. I mean small in comparison with the very wide angles that are now sought in powers from a quarter of an inch upwards.—I make these remarks because I really hope and believe that some of you will make the microscope an object of interest in that kind of recreation which we all of us require after the fatigues of business; and, as I said in the last lecture, I cannot imagine anything more grateful to the mind, and really more interesting to those who will acquire the knowledge requisite to give it that interest. These lenses of a moderate angle of aperture may be obtained at very much lower cost than these special lenses that are manufactured with the express view of resolving diatoms.—I have placed several specimens of these extremely beautiful forms under the microscope upstairs. I will allude to them more particularly presently, but I may say there is no doubt whatever they are plants. They have all the attributes of plants, for if we just take away this curious siliceous envelope, we have simply a vegetable cell.

There is one very curious and interesting thing about them, namely, the fact of their conjugation. This was discovered by my friend Mr. Thwaites, whom I have the pleasure of reckoning one of my own early pupils, and who is now curator of the Botanic Gardens in Ceylon. It was very much in consequence of my recommendation that he devoted himself with a microscope that we should scarcely look at, so poor was it, certainly inferior to one which you can now get for £3 or £4, to the study of the lower tribes of plants in the neighbourhood of Bristol. He was rewarded by the discovery of this very curious phenomenon, which is termed conjugation. I will show you what this means in some other tribes of plants. There is one of these filamentous *Confervæ*. Two filaments of this, lying side by side, put out little projections, these unite together, and the green matter passes entirely from the cells of one tube into those of the other, and then, after a time, it all aggregates together and forms this green mass which is liberated at last by the bursting of the cell that encloses it. These, I believe, are true sexual products, and this conjugation I regard as the lowest form of a true generative process, the reunion of the contents of two cells. Here there is very little difference between the male and the female. You can scarcely see which is the male and which is the female. Sometimes the process takes place in a little bridge between the two; each discharges its contents into the little bridge, and there does not seem to be any definite difference between the one and the other. But then, on going a little higher, we find that what is discharged from the cell that empties itself completely is not mere simple green matter, but is composed of little minute filaments, similar to the spermatozoa of animals. These little green filaments are called antherozoids, and they take the place and perform the function of the pollen liberated from the anthers of flowering plants. They are called antherozoids, because they are so much like the spermatozoa of animals, -zoid being the termination expressing likeness to an animal. That mode of conjugation leads us towards the true sexuality of the higher *Cryptogamia;* but the conjugation of Diatoms is essentially similar to that of the conjugating *Confervæ*. The variety in the forms of diatoms is very great, but their conjugation is always the result of the meeting or reunion of two cells; and sometimes the contents of one are entirely discharged into the other, and sometimes the contents of both cells are discharged and mix with each other, and then a new envelope forms around it. That discovery was a most important one in fixing our ideas as to the real character of these bodies, by showing that they were as truly Vegetable as these filamentous *Confervæ*, about the vegetable nature of which there is no question whatever.

Now I will take you to a higher form of vegetation, the Ferns, to show you what has been the remarkable result of microscopic study in throwing an entirely new light upon the sexuality of the *Cryptogamia*. You all know that from the time of Linnæus the sexuality of flowering plants has been admitted, and that the pollen performs the function of the male, and that the apparatus containing the ovules is essentially the female part of the organization. But as to the *Cryptogamia*, the lower tribe of plants, including ferns, mosses, seaweeds, and so on, there was no knowledge at the time of Linnæus what their true generative process was. It was perfectly well known that they had a fructification. I suppose most of you know by ordinary observation those long stalks of the mosses that grow upon walls. For instance, in the autumn you will see these mosses bearing long stalks with beautiful little urns at the top, and these urns contain a number of little bodies, which are known as the sporules of the moss. So, again, you are acquainted, no doubt, with the so-called fructification at the back of a fern-leaf, consisting of spots or ridges of a brown, or in their early stage yellow hue. They are made up of minute spherical, or pear-shaped bodies, composed of two halves, that are carried apart when they burst by the elastic ring that extends them, and they thus set free the little sporules that they contain. If you take a fern-leaf in fructification, put it upon a piece of white paper, and leave it for a day or two, you will find the paper covered with an excessively fine brown dust. If you examine this with a microscope, you will find that it is composed of very minute particles, rounded or angular, which are known as sporules, and every one of these may produce a new fern. But, although all this was known, it was not known how these sporules originated, or whether there was anything in the ferns or mosses at all comparable to the sexual processes of the higher plants. That discovery was made by Suminski, a Polish count, about twenty-five years ago, although it had been partly made before. That was the origin of all our improved knowledge of the *Cryptogamia;* and I will now show you what is the real generative process in the ferns. That spore is a bud. The whole of this apparatus that we call the fructification of a fern is a process for producing *gemmæ*, or buds; and the real sexual generation takes place in a very early stage of the growth and development of these *gemmæ*. If you sow some of these sporules upon a bed of damp earth in a hothouse, where the surface of the garden pot is always kept moist by the dampness of the atmosphere, and at the same time properly warm, you will find after a time that the surface of the mould is covered with very minute green particles; and if, when they be grown a little larger, you take them up, and submit them to the microscope, you will find that they are little, flat, leafy bodies, with rootlets passing down into the soil. If you have not access to a greenhouse or hothouse, there is another very simple mode by which you may perform this very interesting experiment. If you take a bit of porous sandstone, put it in a saucer of water, and sow the sporules of fern upon it, and then cover it over with a bell-glass and keep it in a warm place,—for nothing is needed but water and air to supply the materials for the development of these little bodies,—they will grow into the minute leafy expansions represented on this diagram. When these are carefully examined in the microscope, it is found that there are two kinds of bodies in them, quite distinct from the ordinary cells. One kind consists of little chimney-like bodies, at the bottom of each of which is a green cell; and if we look down at the tube from above we see it is bounded by four cells. In other parts we see little rounded or globular groups of cells, every one of which contains, coiled up within it, a little spiral filament, which is set free by the bursting of the cell, and then it is exactly like the spermatozoon of a mammal. Every one of these clusters sets free a number of these antherozoids, which move about on the leafy expansion until they make their way into the aperture of one of these chimney-like bodies, and, reaching the bottom, they come in contact with the green cell, and dissolve away, as it were, upon it. Their substance becomes incorporated with the substance of the green cell, which at that time has no definite cell membrane; but after this incorporation has taken place the cell is invested with a membrane, and becomes the true primordial cell of a new fern, which is progressively developed from it. That is the process which takes place in these little minute green leafy bodies that had previously escaped notice almost entirely. Here are representations of the various stages through which it passes, and the leafy expansion to which I have already directed your attention has exactly the function of the cotyledons in a common plant; it absorbs nutriment, and supplies it to the young embryo, until it has developed a rootlet capable of penetrating the soil, and a young leaf extended to the air.

You see, then, what a curious history is here opened to us by this minute examination; and the same history has been traced out in the Mosses, and in the tribe of plants humbler than the mosses, the Liverworts. The same again in the seaweeds, the common *Fucus vesiculosus*, so plentiful on our coasts. The green and yellow swellings found upon these contain cells which again contain these antherozoids, and other cells that contain the primordial embryo cells; and there is in all a true sexual reproduction. There is some uncertainty about the Lichens and Fungi, but there can be no reasonable doubt that the same process does take place in some stage or other of their growth, as it has been traced in all other *Cryptogamia*.

These are a few scattered notes of some of the phenomena of the humbler kind of vegetation, which I thought it would be most interesting to you to be made acquainted with; and I will conclude with noticing one or two forms of Animal life. It is impossible for me to go into the general subject of Animalcules in this lecture, because our time is already expired, and I wish you to have an opportunity of examining for yourselves some microscopic objects which I have placed in the library. But I wish to direct your attention, in connection with the last lecture, to one tribe of these lower forms of animal life, the *Polycystina*, which are closely akin to the Foraminifera on which I before spoke to you, but which differ in this respect, that these little masses of animal jelly, which are the constituent parts of these creatures, the *Polycystina*, have the power of secreting silex, just like the Diatoms among plants. All the skeletons of the Foraminifera are composed of carbonate of lime, except where they build themselves up skeletons with sand; but the *Polycystina*, which are generally speaking animals floating on the surface of the sea, form the most beautiful skeletons it is possible to conceive, of silex or flint. There are a great number of these living at the present time on the surface of our seas, and in the Adriatic they seem to be especially abundant; but some of our best illustrations of this group are obtained from fossil deposits, and especially from one in Barbadoes. The island of Barbadoes is chiefly made up of two rocks, one a converted coral, a coral limestone, and the other a sandstone, which is entirely, or almost entirely, composed of these *Poly-*

cystina. To prepare them, all that is necessary is to boil them for a short time in soda to dissolve away the cement, which more easily dissolves than the shells themselves; and then it is found that the whole mass that remains is a mass of extremely beautiful siliceous shells. Upstairs there are placed in the microscope two examples of these, one an ordinary group, which I obtained by the process I have just described, and the other is a selected specimen. You must not suppose that the beautiful circles you see there occur in nature; they are picked out by the delicate fingers of children, and arranged in rows, so as to constitute, so to speak, a show object.—After briefly describing the various specimens arranged in the library under the microscopes, Dr. Carpenter concluded his lecture by expressing a hope that he had succeeded in inoculating some of his hearers at any rate with a taste for what he was confident would prove both an interesting and valuable pursuit, ministering, at the same time, to recreation and mental improvement.

IVA (*ACHILLEA MOSCHATA*).

BY DR. A. V. PLANTA-REICHENAU.

The plant is known in Switzerland as forest lady's herb (*Wildfräulein-Kraut*), and has been used there for centuries as a stomachic, tonic, etc.

The author collected the herb before flowering without the root. It was, in the form of a coarse powder, distilled with steam until volatile oil ceased to come over, and the aqueous decoction evaporated to the consistency of an extract. The herb thus exhausted with water was dried and extracted with alcohol until it ceased to impart to it a bitter taste; most of the alcohol was distilled off.

Iva Oil.—The crude volatile oil is bluish-green, of a peculiar, not disagreeable odour, and a taste reminding of peppermint. It commences to boil at 170° C.; the greatest portion distils between 180° and 210° C.; the distillate between 230° and 260° C. is brown and has the odour of wormwood. A dark brown soft resin is left behind, which is not bitter; insoluble in absolute alcohol, but readily soluble in ether and oil of turpentine. The rectified oil was of a faint yellowish colour, an agreeable refreshing odour, and a warm bitter taste, reminding of peppermint. Its composition is $C_{48}H_{40}O_4$; the author names this ivaol.

Ivaïn.—The dark green alcoholic liquid was precipitated by alcoholic solution of acetate of lead; the filtrate was treated with sulphuretted hydrogen and the filtrate evaporated; the residue was washed with acetic acid until the washings were colourless, afterwards with water, until it floated upon it. It was then repeatedly dissolved in alcohol and evaporated, to remove acetic acid, then treated with animal charcoal and the alcohol evaporated. Ivaïn $= C_{48}H_{42}O_6$ has the consistency of Venice turpentine, is of a yellow colour, insoluble in water, and in alcoholic solution has a persistently bitter taste.

Achilleina.—The aqueous extract was triturated with alcohol until it ceased to become coloured; the alcohol was distilled off and the residue precipitated by water. The precipitate having been washed with water, the aqueous liquid was agitated with plumbic hydrate to remove acids. The filtrate was freed from lead, evaporated and alternately dissolved in absolute alcohol and in water, and evaporated until the achilleina yielded clear solutions with both liquids. Thus prepared, it has an alkaline reaction, is brown red, amorphous, friable, very hygroscopic, readily soluble in water, with more difficulty in absolute alcohol, insoluble in ether; its odour is peculiar, its taste very bitter but not disagreeable. The author isolated also the bitter principle from *Achillea Millefolium*, which had been obtained by Zanoa in a not entirely pure state, and found it to be identical with achilleina. Composition $= C_{40}H_{38}N_2O_{30}$. The salts have not been investigated.

Moschatina.—The precipitate obtained by water, in the concentrated alcoholic residue, was taken up by absolute alcohol, evaporated to dryness and treated with water until the mass became pulverizable under water. It is of an aromatic bitter taste, little hygroscopic, barely soluble in water, fuses under water upon the water-bath, and separates from its solution in hot water in a pulverulent condition. Composition $= C_{42}H_{27}NO_{14}$.

Achilletin.—On boiling achilleina for several days with diluted acids, sugar is formed, together with a volatile aromatic principle and probably ammonia, and a dark-brown powder separates which is not bitter; insoluble in water, sparingly in alcohol, and in this solution has an aromatic taste. Composition $= C_{22}H_{17}NO_8$.

The author also obtained stearic acid on cooling the tincture of iva, concentrated by distillation.

The aqueous solution of the ashes contained very little sulphate of lime and magnesia, but considerable alkalies and chlorine. Nitric acid dissolves from the residue carbonates, much lime, also phosphoric acid and little magnesia. The undissolved portion consisted of charcoal and much silica.—*Annalen der Chemie und Pharmacie, August*, 1870.

BEECH-NUT OIL.

In an article on the products obtained from the common beech (*Fagus sylvatica*), Dr. Wetherbee alludes to the oil obtained from the nuts, and gives the following particulars in regard to it:—At 60 degrees Fahrenheit, it has a specific gravity of 0·9225, and at 29 degrees it becomes solid. One thousand parts of alcohol of 90 per cent. will dissolve four parts of the oil, but it is completely insoluble in water. Its composition is carbon, 79·77; hydrogen, 10·57, and oxygen, 9·12, with a trace of extradine matter, etc., in each one hundred parts. Like other expressed oils, it produces acrolein, or the hydrated oxide of acryl, by destructive distillation at a high temperature. By treatment with nitric acid, it also, like other nut oils, yields elaidin or elaidic acid, in combination oxide of glyceryle, and in about 103 minutes, by this process, in converted into a bluish-green solid. The soap made from this oil is of a dirty grey colour, becoming yellow by exposure to the air, and having a slightly characteristic odour of the oil. It is somewhat greasy and pasty, and for these reasons is less valuable to the soap-maker than many other kinds of vegetable oils, though in France it is extensively used for this purpose. Three pounds of the oil will make five and a quarter pounds of soap, as taken from the frame, which in two or three months, by drying, will lose a considerable portion of its weight.

Beech-nut oil, however, is most valuable for culinary and lighting purposes, for the former of which it is considered very wholesome and palatable, and to a great extent takes the place of butter and lard among the French and German inhabitants of certain districts. It burns well, giving a good light, is free from smoke.

When properly refined it is good for lubricating delicate machinery, such as clocks, etc., and for the preparation of hair-oils, pomatums, liniments, ointments, and for many other purposes it is not inferior to most of the vegetable fatty oils.—*Canadian Pharmaceutical Journal*.

Incompatibility of Digitalis with Sulphate of Quinine.—A physician having ordered a mixture containing the syrup of digitalis of the French Codex and acid sulphate of quinine, observed a precipitate at the bottom of the bottle. Supposing that some mistake had been made, he took it back to the apothecary, when it was found that the ingredients were incompatible with one another, the tannin in the digitalis combining with the quinine and forming an insoluble tannate.—*Journal de Pharmacie et de Chimie*.

REPORT ON COMMERCIAL SPECIMENS OF BISMUTHI SUBNITRAS.

The *Practitioner* for March contains a report of the analyses of six samples of bismuthi subnitras, which yielded the following results:—

No.	Oxide of Bismuth.	Arsenic.	Chlorides.	Sulphates.
	Per cent.			
I.	81·33	None	Traces	Minute traces
II.	78·51	None	None	Traces
III.	79·28	None	Traces	Traces
IV.	82·12	None	Traces	Traces
V.	81·80	None	Strong traces	Slight traces
VI.	82·37	None	Very strong traces	Traces

The amount of oxide of bismuth contained in the pure subnitrate is 76·3 per cent.; but much depends upon the amount of washing and the temperature maintained during precipitation. These may cause the quantity of oxide of bismuth contained in this salt to vary from 76 to 84 per cent. The only impurities detected in the samples examined were traces of chlorides and sulphates and very minute traces of iron. All were specially examined for arsenic, but no trace was found in any of them.

ANNUAL FESTIVAL OF THE GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

On Tuesday Evening, 28th February, the Annual *Soirée* and Musical *Réunion* of the Glasgow Chemists and Druggists' Association was held in the Trades' Hall, Glassford Street. Between five and six hundred persons sat down to tea. Mr. James MacDonald (of the Glasgow Apothecaries' Company) occupied the chair; and among the gentlemen on the platform were Messrs. Aitken and Ainslie, Edinburgh; Drs. T. D. Buchanan, A. M. Robertson, R. Carter Moffat, etc., and Messrs. William Greig, James Taylor, Thomas Davison, A. Kinninmont, T. D. Moffat, J. M. Fairlie, R. T. Dun, D. B. Ker, Robert Brodie, etc. Letters of apology were received from Messrs. Fraser, Brown, Murdoch, Hatrick, Jaap, Currie, Hart, etc.

The Chairman in his opening address expressed the high gratification it gave him to preside over such a brilliant assemblage as that met that night. He had at first some misgivings as to whether he should accept the honour conferred upon him by the Committee in asking him to be their chairman on such an important occasion, and he had done so ultimately on the condition that no speech would be required of him. He could not, however, sit down without saying how pleased he was to know that the trade (he should rather say profession) to which they belonged now occupied such an important position not only in this city but in the kingdom. He was also glad to be able to affirm that the local Association (under whose auspices they were met there that night) had sufficient energy in its Council and Members to make Glasgow one of the first pharmaceutical cities in the country, as it was already one of the first in commerce; but of course energy and perseverance would be almost useless without support and encouragement from one and all connected with the profession. He therefore advised all, the young men in the trade especially, who had not yet joined the Association, to enrol themselves in its ranks as soon as possible, that the labours of the working members to advance the education of the assistants and apprentices may be crowned with success. In further referring to the great good the Society had already done he said he was authorized by the firm with which he was connected to state that it was their intention to hand over to the Council of the Association another £5 (in addition to three guineas already subscribed to the funds of the Society) to be distributed among the members in prizes or in whatever way the Council may decide. After some further remarks about education, poison regulations, and early closing,—concerning which he said he hoped before long to see every doctor's and druggist's shop in the city shutting at 8 o'clock, and a great deal of the Sunday labour curtailed,—Mr. MacDonald concluded a short but pithy address by quoting a piece from 'Horace,' and giving the translation, resuming his seat amid great applause.

An excellent concert was afterwards sustained by Miss Isa Robertson, Mr. Falconer, Mr. Robert Fraser, and a glee party, and several Scotch readings given by Messrs. Wright and Weir.

Short addresses were also given by Messrs. Aitken, Ainslie, and Paterson, and Dr. Moffat, and "Auld Lang Syne" by the audience brought this part of the proceedings to a close.

The Annual Full Dress Assembly was held immediately after the *soirée*, in which upwards of fifty couples took part, and was witnessed by nearly three hundred spectators.

Altogether the Festival was one of the most successful ever held in connection with the Chemists' Association.

DRUG MARKET NOTES.

The following were among the parcels offered for sale in the drug market last week:—

Sarsaparilla,—Honduras, 329 bales; Mexican, 80 bales.
Jamaica Beeswax, 60 barrels.
West India Tamarinds, 41 barrels.
Nux Vomica, 16 pockets and 2 bags.
Senna,—Tinnivelly, 284 bales; Alexandria, 47 bales.
Aloes,—Cape, 118 cases; East India, 10 kegs, 7 cases.
Cardamoms,—10 cases, 21 packages; Malabar, 49 cases.
Blue Galls, 75 sacks.
Castor Oil,—East Indian, 100 cases; Italian, 50 cases.
Bark,—Calisaya, 122 serons; Columbian, 272 serons; Crown, 79 bales; Red, 37 bales; Carthagena, 15 bales; Pitayo, 90 bales; Peruvian, 72 serons.
Indian Bael, 11 barrels.
Gum Sandrac, 33 casks.
Otto Roses, 8 tins.
Ambergris, 8 tins, 50 ounces.
Ergot of Rye, 11 bags, 4 cases.
Cassia Fistula, 92 bales, 35 bags.
Rhatania Root, 35 bales.
Antimony Regulus, 47 blocks.
Kamala, 2 bags.
Matico, 12 bales.
Rhubarb, 136 cases, 31 chests.
Cantharides, 1 case.
Turmeric, Madras, 111 bags and 100 pockets.
Cubebs, 137 bags.
Cajaputa Oil, 101 cases.
Pepper Oil, 1 case.
Macassar Oil, 2 cases.
Citronelle Oil, 78 cases.
Solid Glucose, 18 cases.
Oil Patchouli, 10 cases.
Cascarilla Bark, 360 sacks.

The Pharmaceutical Journal.

SATURDAY, MARCH 11, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

OUR MONTHLY EVENING MEETINGS.

OUR readers will have noticed with pleasure the report, in our issue of the 25th ult., of the proceedings of the Philadelphia College of Pharmacy. After several years' intermission, the pharmaceutical meetings in connection with that celebrated institution have been resumed, and we hope to be able, in due time, to congratulate the College on the success of its fresh endeavours to stimulate research and foster *esprit de corps* amongst its members. Our *confrères* have set about their task in a thoroughly business-like manner, and no apology is needed for introducing here the main features of the scheme by which they hope to render their meetings both profitable and interesting. At the first meeting, on the 18th October, 1870, a committee was appointed to draw up a plan, and at the succeeding meeting in November it reported the following suggestions:—

1. As it is of primary importance that a general interest should be felt or *created* in the attendance of these meetings, the Committee would recommend that an earnest invitation be extended to the members of the College, and all others who may desire to participate in the proceedings, to produce at each of our meetings either written or oral contributions on subjects pertaining to chemistry or pharmacy, or the commercial relation of drugs. Upon the conclusion of such communications, the presiding officer of the meeting to call for any remarks that may be elicited by the subject thus introduced.
2. That there should be appointed annually a Standing Committee, consisting of three members, whose duty it should be to propose subjects for discussion at any of our meetings, whenever there shall be a lack of material voluntarily contributed by members.
3. That a box or other suitable arrangement be provided for the reception of written queries, anonymous or otherwise, which members may desire to propound, relating to any subject connected with the shop or laboratory; which queries may be taken up for discussion either at the meeting in which they are proposed or at a subsequent meeting.
4. That this Committee be requested to obtain, from time to time, the services of any who may favour the meeting with lectures suited to the occasion.

These recommendations were adopted, and Mr. CHARLES BULLOCK, Dr. PILE and Professor MAISCH appointed the Committee for the ensuing year. We reproduce the recommendations *in extenso*, because it seems to us that some such plan is urgently required by our own Society, if the monthly meetings are to be rescued from the miserable condition into which they have sunk of late years.

Notwithstanding the "poisonous" atmosphere just now overhanging, we are congratulating ourselves that, after thirty years of up-hill work, we have grown into the most powerful independent body of pharmaceutists perhaps in the world; and yet of the *few* members who attend our meetings, there is scarcely one but feels humiliated at the want of interest exhibited by councillors, examiners, members, associates and apprentices in a part of our voluntary curriculum which should be a source of profit and delight to old and young.

Our contemporary the *Chemist and Druggist*, ever ready to point out weak points in our official system, has censured us in terms which, though severe, are well merited; and it grieved us not a little to note that Dr. CARPENTER's lectures on the Microscope, recently delivered, were, comparatively speaking, but poorly attended even by associates and students.

These meetings require infused into them the same vitality that now exists in the examining, educational and administrative departments of the Society. But how is this to be accomplished? In our judgment, by following some such plan as is proposed at Philadelphia.

The most important recommendation we take to be the appointment *annually* of a standing committee, whose business and pleasure it should be to cater for their brethren and sustain the high character of the Society and British Pharmacy.

As at present conducted, it seems optional to any person, however ignorant or learned, to extract a roll of manuscript from his coat pocket, and, without any notice or guarantee that it is suitable matter, to read a paper which may occupy one or more pages of this Journal, and which may perhaps deal in generalities on the purity or impurity of the drugs we sell, without embracing a particle of experimental evidence to justify any assumption whatever. It is true the Bye-laws provide "that all communications intended to be made shall be submitted to the President, or, in his absence, to the Vice-President or Chairman of the meeting, for his sanction, and without such sanction no subject shall be introduced;" but in practice it has seldom been enforced, because it was supposed that its observance might increase the difficulties of securing good and suitable communications.

We would suggest, with all respect to the Council, that this Bye-law should be carried out in its integrity; and that, along with the President, a committee of two, *not* holding seats at the Council, should be annually associated, to whom all papers should be forwarded, and by whom they should be read before the meeting, and *approved, abridged or declined* as required. Once secure *good* papers on strictly pharmaceutical subjects, and there will be no lack of listeners.

Perhaps it would be exacting to expect the regular attendance of all the Councillors, members of the Board of Examiners, and the great majority of metropolitan members, many of whom possess a fund of practical knowledge of chemistry and pharmacy which will probably die with them, and the exposition of which would awaken in many a rising pharmacist's breast a feeling of intense gratitude. But we feel that it is incumbent on them to arouse themselves, and remember that there is still ample opportunity for continuing the educational scheme, commenced in 1841, on a higher platform, and that a large number of assistants, well grounded in theoretical knowledge, are still more or less deficient in that sound practical knowledge which has made the world-wide repute of some of our senior members.

Let each of our readers then manfully help the Society in this matter, by active work and frequent attendance, where possible; it is a duty he owes alike to the Society, and, in the elegant language of Mr. Schacht, "to our common Mistress Pharmacy."

SCIENTIFIC HOBBIES.

At the risk of being accused of making a trite observation, we are inclined to repeat at this time what has, in different forms, often been said before, that the man who can lift himself out of the routine and drudgery of his calling, and look upon it as something more than the mere means of obtaining a subsistence, will find that in so doing he makes it much more tolerable. Moreover, he will secure a substantial benefit by his increased skill in his craft. Of no calling is this more true than of pharmacy. He who only sees a cause for annoyance in the unexpected turbidity of a mixture, or the unusual appearance of a drug, knows nothing of the pleasure which is experienced in bringing the results of a favourite study to assist in unravelling the mystery, to say nothing of the additional profit of being able to do so. We need only allude to the articles, by Mr. Stoddart, on Bristol Pharmacology, which are now appearing in the columns of this Journal, as an illustration of the way in which the subjects of daily business may be used for obtaining a considerable amount of healthy recreation.

In the art of pharmacy there is much that is purely scientific, and its followers may well be proud of some who are to be found in their ranks. This is fully recognized in the world of science, which is not at all disposed to look upon as presumption, the ambition of pharmacists to take rank as scientific men, nor like another Jove to resent the encroachment upon its prerogative—

> "Maturate fugam, regique hæc dicite vestro:
> Non illi imperium pelagi, sævumque tridentem,
> Sed mihi sorte datum."

On the contrary, it has shown itself ready to encourage them, and to accord them what honours may fairly be their due.

But many will be ready to say, that there is a long step between scientific studies and the weighing out of pennyworths of carbonate of soda, or perhaps the grinding of paints. This is true; but to such we would recommend the consideration of the remarks of Dr. Carpenter, in the first of the two lectures which have just been delivered by him on the microscope and its revelations. He says, "I hold it "extremely important that every young man should "learn not only how to work, but how to play. I "think that to find a means of constant and attrac-"tive recreation, and especially one which combines "the double character of quiet work at home, and, "on the other hand, gives a zest and interest to a "walk abroad, is to find that which is one of the "very best appliances that any home can have." Or, again, where he speaks of "one of the greatest "comforts to any man of busy life, the comfort of "turning to something which forms a quiet occupa-"tion," as tending more than anything else to distract one from the cares and fatigues of a busy life. This may seem to some far-fetched, but those who have tried it know well that there is a considerable amount of truth in the proverbial paradox, that "a "change of work is as good as a rest."

The particular study advocated by Dr. Carpenter is one in point. Although it might have been expected by a few that the lectures would have had a rather more special bearing upon the application of the microscope to the purposes of pharmacy, still all who heard or have read them must feel convinced that the pharmacist who is a skilled microscopist stands upon a vantage ground when compared with his unskilled brethren. And this is true of almost any study in respect to pharmacy. The man who looks beyond the drudgery is in a fair way to lift himself above it. He will, besides, experience that higher pleasure, so eloquently expressed in the address delivered at the opening of our present session, when it was asked, "Is there so great a dif-"ference between a thing of beauty and a thing of "truth, that one is a joy for ever, and the other "may become a weariness in a paltry lifetime?"

THE MILK JOURNAL.

We have already referred to the establishment of a laboratory in connection with the *Milk Journal*. From the number of that journal which has just issued, it would seem that considerable activity prevails in that quarter, and that a kind of crusade has been entered upon against the dishonest milkman. Country companies which add to their profits by the questionable process of skimming; workhouses supplied with milk consisting half of milk and half water; and a whole multitude of private malefactors (whose names and addresses are not withheld) figure on the black list. Out of 50 dealers in milk, it appears, according to our contemporary, that 13 dealt honestly, 8 doubtfully and 29 dishonestly.

The Philadelphia College of Pharmacy, established in 1821, having now reached its fiftieth anniversary, it was intended to celebrate, on the 23rd ult., its "semi-centennial," by a social *réunion* within its walls of such of its original members as are now living, the former professors, the graduates and members of the college, and the pharmacists throughout the city not connected with the institution. Invitations have also been issued to members of the profession in other cities. The progress of the college during the fifty years of its existence may be inferred from the fact that the number of students in its School of Pharmacy, which in 1821 was thirty, has steadily increased, until this year it amounts to one hundred and ninety-eight. The original college building, having become too contracted for the growing wants, was disposed of and the present substantial building erected, which contains lecture rooms, college hall, library, etc., together with a laboratory fitted up with all the modern appliances for practical instruction in pharmacy and chemistry. One feature of the proposed meeting was to be the exhibition of preparations and apparatus in use fifty years ago, side by side with those of the present day.

The Board of Trustees of the Chicago College of Pharmacy have recently elected Mr. C. C. Tichborne, of Dublin, an honorary member of their College in "consideration and appreciation of his assiduous "and valuable labour to promote the advancement of "scientific pharmacy." This is the second similar recognition that that gentlemen has received from America within the last twelve months.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

March 1st, 1871.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Abraham, Atherton, Bottle, Bourdas, Carr, Dymond, Groves, Hills, Mackay, Savage, Stoddart, Sutton and Williams.

The minutes of the last meeting were read and confirmed.

The following letter was read and ordered to be entered on the minutes:—

"338, *Oxford Street, W.*
"*February 4th*, 1871.

"*To the President and Council of the Pharmaceutical Society.*

"Gentlemen,—I beg to acknowledge the receipt of a cheque for £100, together with a Copy of Resolution voted at your meeting on Wednesday, and beg that you will accept my best thanks for your gift, rendered more gratifying by the kind expressions which accompany it.

"Believe me to remain, gentlemen,
"Yours faithfully and obliged,
"John Barnard."

The Report and Recommendations of the Finance Committee were received and adopted.

The Financial Statement of the North British Branch of the Society for the year 1870 was presented, showing a balance due to Mr. Mackay, the Hon. Sec., of £55. 6*s*. 6*d*.

The several items of the account having been considered and explained by Mr. Mackay, it was

Resolved—That the Treasurer be requested to pay the balance due; and also to advance the further sum of £100 on account of current expenses for the year 1871.

The Auditors' Report on the Financial Statement of the affairs of the Society for the year 1870 was received and adopted.

Resolved—That the Annual General Meeting of the Society be held on Wednesday, the 17th of May next, at noon precisely.

Resolved—That a Conversazione be held on Wednesday, the 17th May, and that the Secretary be instructed to ask for permission to hold it at the South Kensington Museum.*

On the Report and Recommendation of the Benevolent Fund Committee, a grant of £12 was made to a member in Sussex.

The Secretary reported that he had received from the Committee of the Chemists' Ball a subscription of Twenty Guineas to the Benevolent Fund.

Resolved—That the thanks of this Council be given to the Committee of the Chemists' Ball for their subscription of Twenty Guineas.

Applications for grants to the following Provincial Associations were received:—

Ashton and Dukinfield Chemists' Association.
The York Chemists' Association.
The Nottingham and Notts Chemists' Association.

The consideration of these applications was referred to the Provincial Education Committee.

Resolved—That the Conditions under which grants in aid of Pharmaceutical Education in the Provinces are made be committed to the Provincial Education Committee for their revision.

REPORTS OF THE BOARDS OF EXAMINERS.

February, 1871.

England and Wales.

	Candidates examined.	Candidates passed.	Candidates failed.
February 10, Modified	42	29	13
" 15 Major	4	3	1
" " Minor	26	23	3
	72	55	17

Preliminary.—2 Certificates approved.

Scotland.

	Candidates examined.	Candidates passed.	Candidates failed.
February 21, Major	1	1	0
" " Minor	2	2	0
" " Modified	3	3	0
" " Preliminary	6	4	2
	12	10	2

The Registrar presented a Statement as to Members, Associates, and Apprentices of the Society for the year 1870, details of which will appear in the Annual Report, together with an analysis of the Examinations.

* Since the meeting of Council, the Secretary has applied for and obtained permission to hold the Conversazione at the South Kensington Museum on the above-named date. Arrangements will therefore be made accordingly.

Two Pharmaceutical Chemists having paid their arrears and their subscriptions for the current year, were restored to Membership.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Appleby, Calvert ....East Retford.
Masson, George ....London.
Storey, Edward Henry ......London.
Strachan, Alexander ....Aberdeen.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be elected Members:—

Appleby, Calvert ....East Retford.
Barnes, Edwin ....Durham.
Brown, Joseph Frederick ....Dover.
Cooper, Henry ....Leicester.
Franklin, Alfred ....Fareham.
Lasham, John William......Romford.
Masson, George ....London.
Rooke, James Henry........London.
Storey, Edward Henry ......London.
Strachan, Alexander ....Aberdeen.
Yates, Samuel Pearce ......London.
Young, Joseph ....Leicester.

Resolved—That the following registered Chemists and Druggists be elected Members of the Society:—

Arrowsmith, Geo. Wm. Thos...Reading.
Bagnall, William Henry......Lancaster.
Bailey, Henry ....Buckhurst Hill.
Crook, Edward ....Windsor.
Edwards, Edward............Lower Clapton, E.
Fairlie, James Mitchell ......Glasgow.
Fenwick, John ....Glasgow.
Gregory, William ....Weymouth.
Hamilton, James ....Glasgow.
Harrower, Peter ....Glasgow.
Harvey, Joseph Smith........Penzance.
Iley, William Henry ....Old Shildon.
McMillan, John ....Glasgow.
Millidge, Thomas Edward ....Tonbridge.
Palmer, George Dudley ......Notting Hill, W.
Rose, Alexander ....Glasgow.
Scott, Walter ....Dublin.
Young, John Clarkson ....Warrington.

Resolved—That the following, having passed their respective examinations, be elected "Associates in Business":—

MINOR.

Iredale, Thomas ....Leeds.
Speakman, Isaac ....Runcorn.

MODIFIED.

Batty, Thomas ....York.
Conway, John Jones ....Flint.
Davies, George ....Reading.
Legg, Matthew Henry ......London.
Moyle, Joseph ....Hammersmith.
Pointon, George ....Birmingham.

Resolved—That the following, having passed their respective examinations, be elected Associates:—

MINOR.

Atkinson, David ....North Shields.
Beard, James Collins ....London.
Butler, William Harsant ....Frome.
Connor, Thomas Haigh ......Wakefield.
Crofts, Henry Baptiste ......Cranbrook.
Davenport, Horace ....London.
Holmes, Charles Joseph ......Kingston.
Humphreys, John ....Staines.
Jones, Hugh Ellis ....Swansea.
Morgan, William John ......Kinver.
Parker, John Samuel ....Peterborough.
Spong, Douglas Morton ......Bedford.
Watmough, George Capes ....Caistor.

MODIFIED.

Brunton, William Walker ....London.
Doughty, Thomas ....London.
Evans, Daniel Ogilvie ....Halstead.
Field, Henry................Brighton.
Foden, Joel ....Altrincham.
Gibson, Reuben Leonard ....Loughborough.
Graves, Joseph W. ....Reading.
Humphry, Horatio ....Southampton.
Mason, Thomas ....Nottingham.
Robinson, Jonathan Scott ....Rhyl.
Savage, James ....Bradford.
Stevens, Edmund Matthew ..London.
Swain, James ....New Wandsworth.
Williams, William Jones ....London.

PHARMACEUTICAL MEETING.

Wednesday, March 1st, 1871.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The second of two Lectures on the Microscope and its Revelations was delivered by W. B. Carpenter, M.D., F.R.S., F.G.S., F.L.S., which will be found printed at page 721.

At the close the Chairman proposed a cordial vote of thanks to Dr. Carpenter for his interesting lecture, which was carried unanimously.

Many of the audience then adjourned to the Library, where a beautiful series of microscopes and microscopical objects had been provided for their inspection by the kindness of the lecturer.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Ninth Meeting of the Session was held in Anderson's University on the 8th of February; Mr. T. Davison, President, in the chair. Mr. William Greig (of the New Apothecaries' Company) and Mr. Robert Stewart were elected members.

The business of the evening was the delivery of a lecture on "Nitrous Oxide," by Dr. R. Carter Moffat, who treated his subject in his usual interesting and instructive manner. In the course of the lecture he took occasion to exhibit and explain the new anæsthetic apparatus, and at the conclusion performed a successful experiment with the gas upon one of the members who volunteered his services. A hearty vote of thanks was afterwards awarded the lecturer.

The Tenth Meeting of the Session was held in Anderson's University on the 22nd of February; the President presiding. Messrs. Charles C. Loftus, Robert Gibson and Andrew Millar were elected members.

After a few introductory remarks by the Chairman, Mr. A. Kinninmont (Local Secretary to the Pharmaceutical Society, and who has been absent from the meetings for some time through indisposition) was called upon, and delivered a brief but practical address to the members generally. He touched first upon the poison regulations, stating that, in his opinion, all compulsory regulations should be opposed, as he always believed that the education of the individual was a sufficient guarantee for the protection of the public. He also referred to the position of the Glasgow chemists should the regulations become law, and stated that he thought one reason why surgeons, etc. who kept open shop were not distinctly included with chemists to be under the same restrictions was, that Glasgow was entirely exceptional in this respect; that in large towns in England there was no such thing as a medical practitioner having a regular drug business. He might have a surgery for dispensing his own prescriptions, but they had no open retail drug shop as in Glasgow; and he said he had had the greatest difficulty, when in England, in making the chemists there understand that a surgeon could drive about in his carriage attending to his practice, and having one, two, or more retail drug shops attended to by druggists' assistants at the same time. He therefore believed that in the Pharmaceutical and Privy Councils especially the position of the Glasgow chemists was not understood, and he thought it would be worth our while to invite some of the members of these bodies to come and see for themselves. He trusted, however, that Glasgow would be well represented at the Annual Meeting of the Council in May next, and that no effort would be lost to have the obnoxious regulations thrown out till, at least, there is more cause for them than at present.

Mr. Kinninmont then explained at length the steps to be taken in gaining admission as members or associates of the Pharmaceutical Society, and urged upon all most strongly to lose no time in having themselves enrolled, and that those who had examinations to pass, should also get them over as soon as possible. He thought it was high time Glasgow was speaking up for representation in the Council; he thought if we put forth a claim for such, we would receive the support of the pharmaceutists of Edinburgh and other provincial towns; but we must also have a strong force of our own to push the claim forward, and that force can only have weight by being members of the Society; he therefore hoped that the Glasgow chemists would not be content with simple registration as chemists and druggists.

Several other members spoke in regard to the poison regulations, and expressing their appreciation of Mr. Kinninmont's remarks.

The Secretary afterwards drew the attention of the members to the fact, that the British Pharmaceutical Conference would meet in Edinburgh next August, showing them the handsome volume issued by the Conference, 'The Year Book of Pharmacy,' which was to be a yearly publication, and which was sent free to every member, on payment of his annual subscription of five shillings. Several orders were afterwards handed in for the 'Year Book,' and six gentlemen (druggists in business before the passing of the Pharmacy Act 1868) gave in their names to be proposed as members of the Pharmaceutical Society.

OLDHAM CHEMISTS AND DRUGGISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The First Annual Meeting of the above Association was held last month, when there was a good attendance. The business of the evening commenced by the reading of the Secretary's Report, which was as follows:—

This being the first Annual Report of this Association, it gives the Committee great pleasure in having to lay before you a favourable and encouraging one of the transactions of this Association.

During the past year the Association has been somewhat prosperous (though we may say it is yet in its infancy), and it is to be hoped that before another year has passed, we may be on a level with many other societies in Great Britain, and that the young men of this town will do their utmost to gain that position, as there is no doubt it all lies with them as to the future success of this Association.

The Latin class that was formed in April last (under the able tutorship of the Rev. A. Peaton) has been very fairly attended, as three-fourths of the members has been the average attendance.

The numerous presentations which the Association has received since its formation have greatly surpassed our utmost expectations, viz.:—

One handsome show-case, containing in ground stoppered bottles seventy specimens of various drugs of the British Pharmacopœia:

One Materia Medica cabinet, adapted for the Major Examination:

Three books, viz. Lescher's 'Elements of Pharmacy,' Fownes' 'Chemistry,' and Royle's 'Materia Medica.' The Pharmaceutical Journal (by the kind permission of the Pharmaceutical Council) has also been sent regularly as published. These have all been thankfully received and duly acknowledged. We have likewise received several donations from various gentlemen in the trade, which have been a great auxiliary, in this our first year's undertaking, of placing a balance in the Treasurer's hand.

We have a bright prospect before us, and we hope the opportunities derived from the Association may not be lacking in their good results, but that our next report may contain some of the names of members of the Association having passed their respective examinations.

The Treasurer's financial statement was then read, showing a balance in hand of 8*s*.

The report having been confirmed, the following officers were elected for the ensuing year:—President: Mr. Taylor. Vice-President: Mr. Radcliffe. Treasurer: Mr. Hurst. Secretary: Mr. Rhodes.

Votes of thanks having been passed to the retiring officers, the business of the meeting was brought to a close.

LEEDS CHEMISTS' ASSOCIATION.

The Monthly Meeting of this Association was held on March 1st, 1871, when the President, Mr. Smeeton, introduced the subject of the proposed poison regulations. He stated that his opinions had not altered since last year, when it was decided to oppose these regulations on the ground that the best security was the better education of chemists, and that he felt as great a repugnance as others to the inspection of an official as to the way in which he conducted his business. He admitted that, in the main, these regulations were not oppressive; and had they been sent down as recommendations, would probably have been adopted, so far as was possible. He deprecated entirely bringing to the consideration of the subject anything like a foregone conclusion, founded upon proceedings taken elsewhere; and strongly urged the consideration of the subject in a calm and unprejudiced manner. He admitted that the Council had not, in the past, shown anxiety to legislate on the poison question, and had repeatedly prevented unwise and hurtful regulations; and he concluded that its present action was owing to pressure from the officer of the Privy Council. He thought that something might yet be drawn up by the Council of the Pharmaceutical Society which would satisfy the Privy Council and be acceptable to the trade; and quoted from Mr. Brady's letter of July, 1864, wherein he said, "The public will have precautions against accidents adopted; let them be of our own choosing, rather than left to the selection of a Parliamentary Committee. Were the Pharmaceutical Society acting officially, as the body governing, not only the interests of its own members, but those also of the nation at large, so far as pharmacy is concerned, to issue a series of simple and reasonable regulations with respect to the storing and dispensing of poisonous substances, it would require no other authority to ensure their general adoption," etc. The general custom of the trade showed that regulations similar to those before them were in use, more or less; and on the assumption that compulsory measures were certain, it was better to choose them rather than have them decided for the trade by those less conversant with the matter. The regulations themselves were next considered. No great objection was taken to Nos. 1 and 2, but Mr. Smeeton thought there were many difficulties in No. 3, which would almost render its working impracticable. He concluded by saying that, though personally he could comply with the requirements, yet he would not like to force such a measure on the trade, except it was done to prevent a severer and more oppressive measure.

Mr. R. Reynolds took the opportunity of again meeting his friends to say a few words on a personal matter. Being unable, since November, to fulfil his representative duties by attending the meetings of the Council of the Pharmaceutical Society, he had consulted his medical attendants, and also private friends, as to the desirability of resigning his seat, but had been dissuaded from such a step; and now he had reason to hope that he could shortly resume these duties. He regretted much the difference of opinion within the trade, due to divergent views on the policy of the proposed poison regulations. It was especially injurious that their energies were thus withdrawn from the subject of improving the local means of education. However, the responsibility of self-government made it impossible to be indifferent on so vital a question; and all must feel that, in approaching it, they owed obligations to their profession and to the labours of those who had defended and consolidated its rights and privileges during a period of thirty years. The present contention was not as to the object, but the means and consequences. He (Mr. Reynolds) had felt it his duty elsewhere to express strongly his views upon the details of the proposed scheme, which had been most ably analysed by Mr. Barnard Proctor, and also to indicate the probable consequence of its acceptance. As to the charge of ignorant selfishness made against the opponents of the regulations by certain medical journals, the members of the Leeds Chemists' Association could afford to disregard them, and to point to their voluntary action during several years as the best confutation of such a slander.

Mr. Thompson remarked that these regulations could only be enforced by penalties and also police supervision, for it was not to be supposed that a new staff of officials would be organized for the purpose; but that the present guardians of the peace would be empowered to see that these laws, like all others, were properly obeyed. Mr. Thompson then moved the first resolution:—

"That this meeting would have received with approbation a well-considered plan for storing powerful remedies, if recommended for voluntary adoption; but is of opinion that the proposed *compulsory* regulations for the storing and dispensing of poisons are ill-judged and unjust to those to whom they would apply, and that they ought to be resisted."

Mr. Edward Brown, in seconding the resolution, remarked that it seemed to him to be an insult to the trade, within twelve months after such an expression of opinion as emanated from the trade last year, that another set of compulsory regulations should be attempted to be enforced.

The resolution was heartily carried.

Mr. Edwin Yewdall then moved, and Mr. Samuel Taylor seconded, the next resolution, which was carried:—

"It is of the greatest importance that at the Annual Meeting of the Pharmaceutical Society, to be held in May next, the vote of every member of the Society respecting the proposed compulsory regulations for the keeping and storing of poisons should be taken through the post by voting-papers, and not merely by a show of hands of those present; and that due regard be given to the expressed opinion of all registered chemists and druggists."

Mr. Edwin Yewdall, after stating that it would be of no avail to organize a Defence Association after we were once really saddled with the compulsory regulations, proposed the third resolution:—

"That this meeting hears with satisfaction of the organization of a Chemists' Defence Association, and approves of its objects."

Mr. Samuel Taylor seconded its adoption, which was unanimously carried.

It was then proposed by Mr. E. Yewdall, seconded by Mr. R. Reynolds, and carried with acclamation:—

"That the thanks of this meeting be presented to the President, Mr. William Smeeton, for his conduct in the chair."

The meeting then concluded, when several present joined the "Chemists' Defence Association."

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An Ordinary Monthly Meeting was held in the Memorial Hall on Friday evening, March 3rd; the President, Mr. W. S. Brown, in the chair.

The Chairman announced that the consideration of the subject referred to the Council at the last meeting had resulted in the formation of a "Chemists' Defence Association," particulars of which would shortly be in the hands of every chemist in the kingdom.

Mr. W. J. Halliday then read a very interesting paper on "Dispensing," in which he gave a number of valuable practical hints on the subject.

[We propose printing this paper *in extenso* in the next number of this Journal.]

A discussion followed in which many members took part. Opinions were expressed that prescribers should underline any unusually large dose, to indicate to the dispenser that it was not an oversight, and thus relieve him from doubt. That, if any part of the prescription, either the formula or directions, admitted of a double reading, the first dispenser should make a marginal note for the guidance of those who followed him, that uniformity might be secured. That dispensers should accustom themselves to calculate the doses of all active ingredients in a prescription before they commenced dispensing it. That where practicable, the dispensing of powerful medicines should be "checked" by a second person.

"A case containing a great variety of labels for "poisons" and "outward applications" was exhibited by Mr. H. Silverlock, of London.

Proceedings of Scientific Societies.

LONDON CHEMISTS' ASSOCIATION.

The result of the discussions on "Poison Regulations," held at the end of last year, resulted in the following resolution being almost unanimously carried:—

"That the propositions recommended for adoption by the 'Sale and Keeping of Poisons Committee,' and published in the Pharmaceutical Journal of December 17, 1870, be accepted as satisfactory by this Association."

An opinion was generally expressed that the system marked II. is to be preferred; it was considered also that Clause III. in the old propositions, regarding the sale and *dispensing* of medicines, ought not to be omitted from whatever regulations are introduced.

Thursday, Feb. 9, 1871; the President in the chair.

Mr. Pick read a paper on "Belladonna and its Preparations." He gave an interesting history of the plant from the earliest writers, and of its medical value being discovered by Lugus, in the year 1532, and an accurate botanical description, stating that it belonged to the Natural Order *Atropaceæ;* some botanists classified it under *Solaneæ*, but the plants included in this Order (*Atropaceæ*) were separated from *Solanaceæ*, and formed into a distinct class under that name by Miers, the chief distinguishing character being the different æstivation of the corolla. The generic name *Atropa* was taken from Atropa, one of the Fates, who was supposed to cut the thread of life. Its chemical constituents were treated upon at some length, as also its therapeutic properties, which, he said, extended more or less over the whole human body, but more especially the face and head, dilating the pupil of the eye. Its effects on the throat were very marked, it was used successfully in scarlet fever, small doses acting as a preventive. The officinal parts of the plant, both dried and fresh, next received attention, and its cultivation and collection in Britain and Germany. After a few remarks on the extract, tincture, etc., and their preparation, he concluded with the active principle atropia, the sulphate of atropia, and Pseudotoxin.

A long and interesting discussion followed, bearing very much on the uncertainty of the strength of the extract and the advisability of making emp. bellad. from a root extract.

MEETINGS FOR THE ENSUING WEEK.

MONDAY ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"On Astronomy." By Mr. R. Proctor.

TUESDAY ......*Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.
Royal Medical and Chirurgical Society, at 8.30 P.M.
Photographic Society, at 8 P.M.

WEDNESDAY...*Society of Arts*, at 8 P.M.—"The Different Methods of Extracting Sugar from Beetroot and Cane." By Mr. F. Kohn.
London Institution, at 6.30 P.M.—Conversazione. "Stained Glass æsthetically considered with reference to Modern Art." By Mr. H. Holiday.

THURSDAY......*Royal Society*, at 8.30 P.M.
Linnean Society, at 8 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." By Prof. Odling.

FRIDAY ....*Royal Institution*, at 9 P.M.—"The Eclipse." By Mr. Lockyer.

Parliamentary and Law Proceedings.

DEATH RESULTING FROM AN EXCESSIVE DOSE OF CHLORAL HYDRATE.

The *Lancet* of the 18th inst. contains a report by Dr. Norris of a case of overdose of chloral hydrate, which appears to be the same as that already recorded in the PHARMACEUTICAL JOURNAL, p. 636. As any additional information as to this now extensively-used drug is of importance, we extract the following particulars:—

The deceased, who appears to have been a victim to dipsomania, when opposed in her desire for stimulants, was very violent. No sedative seemed to produce any effect but chloral hydrate, and for months previous to her decease she was supplied almost every evening with a draught containing from twenty to forty grains. After some time, Dr. Norris was astonished to hear that his patient had been taking, in addition to the draughts supplied by himself, others which she had obtained from a druggist, containing from thirty to thirty-six grains. The following list gives the quantity of chloral hydrate taken by the deceased during the last nine days of her life, the asterisks denoting the draughts supplied by the druggist, of which Dr. Norris had no knowledge until after his patient's decease:—

On the 3rd of January, after 10 oz. of Townsend's sarsaparilla, she had 36 grs. of chloral; on the 4th, 36 grs.*; 5th, 30 grs.; 5th, 36 grs.*; 6th, 30 grs.; 6th, 36 grs.*; 7th, 30 grs.; 7th, 36 grs.*; 8th, 20 grs.; 8th, 40 grs.; 8th, 36 grs.*; 9th, 10 grs.; 9th, 30 grs.; 9th, 36 grs.*; 10th, 10 grs.; 10th, 40 grs.; 10th, 108 grs.*; 11th, 40 grs.; 11th, 72 grs.* Thus making a total of 712 grs. within nine days, the last 260 grains of which had been taken within thirty-five hours.

A hundred and thirty hours after death the stomach and contents, together with portions of the lung, liver, heart, kidney and spleen, were submitted to Mr. Stoddart, of Bristol, for analysis. His report was as follows:—

"The first thing that struck me was the very extraordinary way in which the several portions were preserved. Even now, although more than a week has elapsed since death, yet not the slightest sign of decomposition has taken place, nor any unpleasant odour. This doubtless is the effect of chloroform in the tissues. Part of the gruel-like contents of the stomach was treated with caustic soda, and distilled at 160° F., and the vapour passed through a red-hot glass tube. Chlorine and hydrochloric acid were produced, which reddened litmus paper. Iodide of potassium and starch were coloured blue, and then decolorized. Solution of nitrate of silver threw down the chloride.

"Another portion was placed in a small alembic, with a mixture of potash and soda, and distilled at 160° F. by means of a water-bath, and the head of the exit tube immersed in pure distilled water contained in a small Clark's receiver. In a few minutes small drops of chloroform were slowly deposited at the bottom of the water. These were pure chloroform. The smell of chloroform was perceptible in the alembic the day after. I tested for all the poisons that were probable, but without any success.

"There seems, therefore, no doubt that an excess of chloral must have been taken, and the resultant chloroform was so disseminated through the tissues that they were completely preserved. I should mention that the contents of the stomach had no perceptible smell of chloroform till after the addition of an alkali."

In a subsequent letter, Mr. Stoddart adds:—"I found the most (chloroform) in the liver and contents of the stomach, but could not separate any from the other parts; nor could I from the heart, which seemed to have lost any blood contained in it."

Dr. Norris considers that the mode of death supports the opinion of Dr. B. W. Richardson that, in such cases, dangerous decomposition of the blood may occur before coma is produced, and that the repetition of considerable doses of chloral at short intervals would be followed by the formation of formiate of soda in the blood, by which its coagulating power would be much diminished; and that in such cases the symptoms would be similar to those induced by loss of blood.

POISONING BY CARBOLIC ACID.

An inquest has been held at the Whitechapel District Schools, Forest Gate, touching the death of two children, inmates of the schools. It appears that it was the duty of a nurse to disinfect the lavatory every evening by means of carbolic acid, and then carry what acid remained to the boys' side of the building. On Friday evening, after using the acid as usual, she left the remainder in a vessel in the lavatory. On the following morning the two children came downstairs a little before seven o'clock, and, seeing the vessel in the lavatory, each drank from it, and directly fell down insensible. Medical aid was promptly obtained, but to no purpose. The jury returned a verdict of "Accidental poisoning." —*Standard.*

HOUSE OF COMMONS.

On Monday, March 6, Sir J. LAWRENCE gave notice that on Thursday he should ask the Chancellor of the Exchequer whether the Board of Customs had allowed 15 instead of 10 per cent. of spirits to be mixed with wines in bond for the purpose of fortifying them.

Review.

A MANUAL OF STRUCTURAL BOTANY: for the uses of Classes, Schools, and Private Students. By M. C. COOKE. With upwards of 200 Illustrations, by Ruffle. Third Edition. London: Robert Hardwicke. Price 1s.

We are glad to welcome the appearance of a new edition of this useful little manual; it is too well known to require any lengthened notice. Having originally been prepared for use in classes organized by the Science and Art Department, it has somewhat of a special character, and this has doubtless prevented the author giving full scope to his own ideas of the best mode of teaching structural botany. Though the book has been called a collection of "dry bones," yet it is a most philosophical and well-proportioned skeleton, forming the best arranged note-book with which we are acquainted.

The book is divided into forty sections, corresponding to the number of lessons required by the Department to be given in their classes. Pages 1–19 are taken up with the chemistry of the subject, the nomenclature of which has been brought up to the present day. Four sections are taken up with a description of cellular and vascular tissue, cell development and contents, and of the epidermis and its appendages. Next we have the structure, form, and modifications of roots, and of the ascending axis of exogens, endogens and acrogens, followed by chapters on the structure, parts, form and arrangement of leaves, and their appendages, flowers, ovules, fruits and seeds. These sections are followed by others devoted to the subjects of germination, vital action, the reproduction of algæ, lichens, mosses and ferns, vegetable phenomena, epiphytes and parasites, galls and excrescences. The last section contains very useful hints and models for the botanical description of plants.

As an illustration of the author's manner of dealing with the subject, we will give his chapter on

SUBTERRANEAN STEMS.

"Under the name of subterranean stems we have included also those which are prostrate and not strictly subterranean.

"The majority of forms to be described in this section are properly designated as *roots*.

"It must be remembered that *roots* do not possess scales (modified leaves) or buds (rudimentary leaves) or nodes (whence buds are developed).

"The *Rhizome* (*rhiza*, Gr. a root), or root-stock, is a thick, procumbent stem, partly, and sometimes entirely under the surface of the soil. It develops roots from its underside, and leaves from its upper. Its surface generally bears the scars left by the falling away of old leaves. (Fig. 44.) *Ex.* Iris.

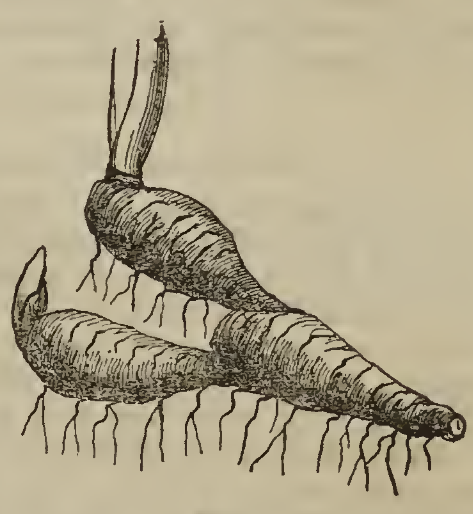

Fig. 44.

"The *Flagellum* (Lat. a young twig), or runner, is a long, slender, procumbent branch, which develops a leaf-bud from its upper surface, and roots from its under, at each node. Each vegetating node becomes a perfect plant (Fig. 45). *Ex.* Strawberry.

Fig. 45.

"The *Soboles* (Lat. a shoot, or young branch) is a creeping underground stem, or branch, which emits roots from its under-surface and leaves from its upper. It thus resembles a rhizome, but is much more slender, and subterranean in its character. (Fig. 46.) *Ex.* Couch grass.

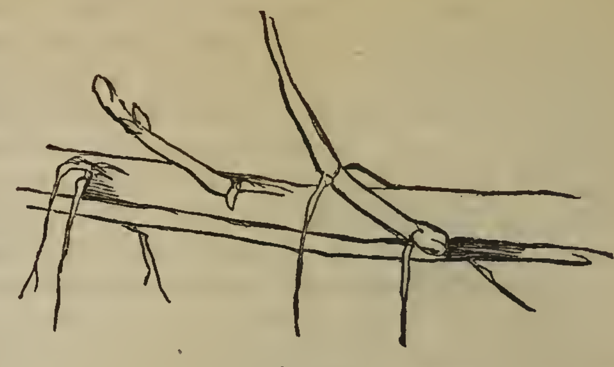

Fig. 46.

"The *Tuber* (Lat. a knob) is a thickened portion of an underground stem or branch, which serves as a depository for starch, and other nutritious secretions for the service of the plant. (Fig. 47). *Ex.* Potato.

Fig. 47.

"A scaly modification of the tuber exists in the species of *Maranta* which yields arrowroot.

"*Bulbs* are scaly modifications of leaf-buds developed upon a flattish disk, from the under surface of which roots are directed downwards. (Fig. 48.) *Ex.* Onion.

Fig. 48.

"The *Pseudo-bulbs* of orchids are thickenings of the base of the stem by the deposit of bassorine; they are produced above the surface, and are of a green colour.

"*Corms* (*kormos*, Gr. a stem) are also expansions of the base of the stem, differing from bulbs in being solid and not scaly, and from pseudo-bulbs in being subterranean, and consequently not green. Corms also contain starch and other nutritious secretions. Some botanists consider them as buds. (Fig. 49.) *Ex.* Meadow saffron.

Fig. 49.

"*Bulbs*, *pseudo-bulbs*, and *corms* are confined to endogenous plants."

For a beginner, the book will prove itself a very valuable aid; for the advanced student, a friendly remembrancer of byegone studies, and in either case a worthy companion to the larger works of Professors Bentley, Balfour, and Henslow, whilst its small size renders it a pocket companion for perusal during those odd fragments of time which play no inconsiderable part in a successful life.

The arrangement, illustrations, and type are good, and we wish the book long-continued success.

Obituary.

We regret to have to announce the death of Mr. JOHN CHAPMAN, Pharmaceutical Chemist, of Tring. The deceased gentleman entered the Pharmaceutical Society in 1853, and has for many years been a very useful member, ready at all times to do all in his power to further the interests of that body and its Benevolent Fund. He died suddenly on the 28th of February last, at the age of sixty.

On February 21st, 1871, Mr. FREDERICK HENRY GARNER, of Aylesbury, aged twenty. Mr. Garner had but recently entered as a student at the School of Pharmacy, Bloomsbury Square.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[137.]—HAIR DYE.—A correspondent sends from Michigan the following receipes to the *New York Druggists' Circular*:—

Potassæ Permang. ʒj
Aq. Destill. ℥xvj.

I. Acid. Pyrogallic. ʒj
Aq. Coloniensis ʒij (? Eau de Cologne).
Aq. Destill. ℥v.
II. Argenti Nit. ʒij
Aq. Destill. ℥iv.

I. Pulv. Gallæ ʒvj
Aq. Fontan. ℥ij.
Boil and strain.
II. Argenti Nitr. ʒij
Aq. Destill. ℥ij, ʒij (ʒxviij)
Aq. Ammon. ʒj.

[156.]—WHITE OILS.

℞. Ol. Terebinthinæ ℥v
Ol. Lini ℥vij
Sp. Camph. ℥ss
Sp. Æth. Nit. ℥j
Tr. Opii ℥j
Mellis ℥ij.
M. S. A. J. Ash, *Birmingham.*

In reply to *J. T. N.*, inquiring for a recipe for white oils, I think the following will be found a very good one:—

℞. Ol. Terebinthinæ ℥vj
Liq. Vol. C.C. ℥vj
Ol. Rapæ ℥vj
Ol. Origani ʒiv
Lin. Sapon. ℥ij
Misce. J. S. Parker, *Peterborough.*

J. T. N. will find the following to be what he requires:—

℞. Ol. Terebinthinæ,
Liq. Vol. C.C., ana ℥xij
Ol. Rapæ ad ℥xl.
Misce.

[159.]—ANISEED CORDIAL.—For want of a better formula, I have made the following, and should be very glad if any one can improve upon it:—

℞. Ol. Anisi ʒss
Sacch. Alb. ℥ij
Syr. Simp. ℥iij
Sp. Vin. Rect. ʒviij
Aq. Dest. ℥xxx.

The oil to be well rubbed with the sugar; add the water gradually; mix the remaining ingredients, and filter.—S. D.

[160.]—*S. C.* will find a form for liq. quinæ ammon., in Squire's 'Compendium,' similar to the one given in the Journal, only Squire orders rectified spirit.—Iodi.

[*** We believe the following is also used by some houses:—

Quinæ Disulphatis gr. j
Sp. Ammoniæ Aromatici ʒj.
Misce.—Ed. Pharm. Journ.]

[161.]—TINCTURE OF MYRRH AND BORAX.—

℞. Gum. Myrrhæ ℥ij
Rad. Krameriæ ℥ss
Spt. Vini Rect. ℥xxiv.
Stet dies xiv, dein cola et adde:
Sodæ Bibor. ℥iij
Aq. Ferventis ℥vj
Glycerini ℥xij
Perfume q. s. si opus sit.—E. H.

[166.]—BLACK INK.

℞. Gallæ Contus. lb. j
Ferri Sulph. ℥iv
Cupri Sulph. ℥ss
Hyd. Perchlor. ℈ss
Sacchar. Fusc. ℥iij
Gum. Acaciæ ℥iv
Aquæ Pluvial. Cong. j
Sp. Vini Meth. ℥j
Misce secundum artem.—E. H.

The fault of most black ink is too much iron, turning the writing brown from oxidation. To remedy this, acid (generally vinegar or an acid salt, as alum) is added, which corrodes the pens. The iron should only be in sufficient quantity to strike a black colour. The following will be found a convenient and excellent formula:—Boil 1 part of granular powdered galls with 20 parts of distilled water in a glass flask for fifteen or twenty minutes; then add 1 part sulphate of iron, dissolved in 2 parts of distilled water, and 1 part of mucilage of acacia; shake all together. It is ready for immediate use, but improves by keeping. It is better not strained, but poured off as wanted. A few drops of carbolic acid may be added to preserve it, if required to be kept long.—W. B.

[179.].—ESSENCE OF MOSS ROSE.—

℞. Otto Rosæ ʒiss
Ess. Ambergris ℥iiss
„ Moschi ℥j
Sp. Vini Rect. ℥xv
Aq. Rosæ Conc. ℥x
—Alpha.

COLD CREAM.

Take White Wax.
Spermaceti, of each, 1 oz.
Oil of Almonds, ¼ pint.

Melt, pour the mixture into a Wedgewood mortar which has been heated by being immersed in hot water; add gradually—

Rose Water, 4 fl. oz.

and stir until an emulsion is formed, and afterwards until the whole is nearly cold. Put in pots. [It may be perfumed with bergamot or lavender.]

[183.]—TINCTURE OF HOLBECK.—Required a practical formula for tincture of holbeck, with dose.—V.

[184.]—BLACK KID REVIVER.—*E. W.* would esteem it a favour if any reader would oblige him with a recipe for black kid reviver.

[185.]—TACAMAHAC.—Can any reader of the Pharm. Journ. give me any information respecting "Tacamahac," and favour me with a form for a preparation of it used for wounds?—All Saints.

[*** Tacamahac, or tacamahaca, is a resinous substance, obtained from various sources, partially soluble in alcohol, completely so in ether and the fixed oils. It was formerly highly esteemed as an internal remedy, but is now employed medicinally only in ointments and plasters, and that to but a small extent. Its properties are analogous to those of the turpentines. It is sometimes used in incense.—Ed. Pharm. Journ.]

[186.]—BAKING-POWDER. — "*Farina*" would feel obliged to any reader for a form for good baking-powder.

[187.]—LOTION FOR THE SKIN.—Will any correspondent kindly give me a recipe for a good and harmless lotion for roughness of the skin, pimples, etc.?—Alpha.

[188.]—WATERPROOFING.—Will any correspondent kindly give me a recipe for waterproofing?—G. B.

[189.]—ESSENCE OF VANILLA.—*Iodi* wishes to know the usual strength of essence of vanilla sent out by the wholesale houses.

[*** We think our correspondent will find the information he asks for in 'Cooley's 'Dictionary of Practical Receipts.'—Ed. Pharm. Journ.]

Correspondence.

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

THE PROPOSED POISON REGULATIONS.

Sir,—After the very voluminous correspondence that has for some time filled the columns of the Journal, from writers of every degree of ability and every shade of opinion, I feel it is scarcely possible to bring forward any new idea or any fresh argument on the subject. But as there appears a desire on the part of the Council to learn the general sentiment of the members of the trade, I venture, at the risk of only telling an oft-told tale and repeating what has already been said better by others.

After reading nearly all that has appeared, and reviewing the origin and progress of this vexed question, I confess to feeling some sympathy for the Council, under the very trying circumstances in which they have been placed, and the annoyance they have endured; still this is only matter for sympathy, but the subject is one involving a great public interest, and ought not, therefore, to be disposed of on sentimental grounds.

After all that has been stated on both sides, including "secret treaties" and "tacit understandings," the question resolves itself into one of expediency, and the proposition certainly involves in it police interference prospectively, and pains and penalties for any infringement.

It has been said the regulations are necessary, because a large number of those in business are not properly educated men; by this, I suppose, is meant not systematically educated, which may be admitted; and I would say further that to these the regulations would be a stumbling-block and a rock of offence, making confusion worse confounded. On the other hand, to the properly-trained and systematically-educated man, they are quite unnecessary. His own knowledge and understanding will supply him with regulations that will meet his own requirements far better. Now, the first of these two classes is fast passing away,—a few years and they will be amongst the things that have passed into oblivion.

Is it, therefore, wise or expedient to put upon us a yoke that will gall us in perpetuity, in order to remedy an evil that is only transitory, and will soon come to an end? Pharmacy in England has not yet attained to the dignity of a profession nor the position of an exact science, and until the old leaven has exhausted itself, it will not. An honourable career, I believe, is open to it, but the time has not yet arrived, and it will never do to stifle the new-born life out of it by oppressive legislation.

As regulations recommended for adoption by the Society, there is little doubt but they would be followed by all respectable men, and those who are obstinate enough to refuse, must be left to their own fate. There is, perhaps, one exception will be taken to this, and that is the dispensing clause.

Bradford, March 7th, 1871. F. M. RIMMINGTON.

Sir,—In the last issue of our Journal you make the remark (p. 699) "whatever may be the proper view to take as to the proposed regulations, we cannot agree with the opinion that they should not be adopted because medical men neglect them. That argument, at least, appears to be fallacious."

You, Sir, as representing the majority of the Council, surely do not understand the position of chemists in Scotland. We do not wish to meddle with medical men as such, but when they become druggists by keeping open shop, then we claim to have them under regulations as well as the other portion of shopkeepers, if such regulations are required for the safety of the public.

If you or any of the Council will visit our city—a city of no mean importance—I will show you the actual fact that medical men do become druggists. What do you call a person with the following over his door:—

"Chemist and Druggist," Dr. A. B., Surgeon? or Apothecary Hall, Dr. C. D., Surgeon?

Such is the rule here, not the exception. Their shops, for style and appearance, will bear comparison with any in the kingdom.

There is no fallacy in such hard facts, and I maintain that when a medical man keeps an open shop and retails Holloway's pills and every other quack medicine, he is to all intents and purposes a druggist. Scotland has only one representative at the Council Board; I think now he should be supported by another from Glasgow, that we, north of the Tweed, may not be misunderstood.

If the article reproduced from the *British Medical Journal* without a word of comment against it, is intended to make us comply with the regulations, never was a greater mistake made. It will only arouse within us a firmer determination to reject the regulations, regardless of the threat that "an obstinate resistance to the demands of the Privy Council must lead to the recasting of the Pharmaceutical monopoly."

Let the Privy Council first prove that poison regulations are required for the safety of the public, and next let the *British Medical Journal* prove that "we wish to be protected, and are willing to leave the door as widely open as ever to all the calamities which spring from carelessness or ignorance of persons dealing with medicines," and "are regardless of the sacrifice of life."

If, Sir, we had a monopoly of our business and there were no open surgeries, I wonder how many lives would be sacrificed by our carelessness in dispensing; the cases which have occurred lately certainly prove less lives would be lost.

A member of a late ministry once said the chemists in Scotland were the most intelligent class in the community, and he would oppose their exemption from juries on that ground. If such an opinion is held concerning us, surely we shall be heard in any future legislation concerning our and the public interests. THOMAS DAVISON.

Glasgow, 1st March, 1871.

Sir,—I fully agree with the remarks in the letter of this day's Journal written by Mr. Clement Pierson, of Leeds, relative to the "Poison Regulations;" they are most pertinent to the question at issue. If the status the passing of the New Pharmacy Act has given us will not secure that due and proper precaution so indispensably requisite for the public safety, sure I am that nothing Government can put upon us in the way of coercion will effect that end.

J. BARKER.

37, *Market Hill, Sudbury, March 4th,* 1871.

Sir,—"A house divided against itself cannot stand," and if we members persist in dividing ourselves into two camps, how is our Society to prosper, and in what light shall we appear in the eyes of the Privy Council?

Let us first agree among ourselves as to the best methods of conducting our own affairs, and then we shall command the respect of Government and be trusted with the responsibility of making any regulations where the public well-being is concerned.

All well-wishers of the Pharmaceutical Society must regret the wide controversy on the proposed "poison regulations," and I have looked in vain, hoping for some abler pen than mine to propose some middle course in which the extremes might shake hands and unitedly appear in a strong position before the Government, who will certainly take action in this matter if we do not, or succeed in showing good cause to the contrary. The whole case seems to resolve itself into the fact, that, at the time the Pharmacy Bill of 1868 was planned, certain regulations were deemed necessary for the safety of the public in the matter of storing and retailing poisons, and the said regulations were very much left to the arrangement of the Council of the Pharmaceutical Society.

Nearly three years having elapsed, the Privy Council look for a fulfilment of the then implied conditions from the Council of our Society.

Now the reply of the Council appears to me to be palpable, viz.:—

The wise and careful provisions of the Pharmacy Act of 1868, as a whole, for the protection of the public and further regulation of the dispensing of poisons in question, have worked so efficiently and been so faithfully observed by the Pharmaceutical body, that the necessity for any more stringent imposition of any particular clause of that Act than is now generally observed, would be superfluous, for each individual member has voluntarily undertaken, and has carried out such precautions and regulations as his own particular case seemed especially to demand; so that now, to introduce further alteration would destroy, in many cases, great aids to security which at present exist, without increasing such security as is aimed at in a general way.

The Council of the Pharmaceutical Society would, therefore, submit to the Honourable Privy Council, with the unanimous opinion of the whole Pharmaceutical body in general meeting assembled, that the regulations, now in general use, are efficient, and any further regulations for the proposed purpose would not have any tendency to promote the welfare of her Majesty's subjects.

The proof of this position is the fact, that accidents to the public arising from the improper storing and retailing of poisons by Pharmaceutical Chemists and Registered Chemists and Druggists, are now almost unknown, and that the danger is therefore already reduced to the lowest point attainable by any regulations.

Hampstead, March 7th, 1871. WALTER BIGGS.

Sir,—Education is, we are told by those opposed to this proposal, the one safeguard against poison accidents, apparently forgetting that a careless man, although he may have received the best of educations, would remain careless. We do not expect universal education to make policemen magistrates, and judges useless members of society. Daily experience, unfortunately, shows that the worst criminals are too frequently well educated; failure in one case is good reason for doubt in another.

But are we, as a body, educated? The Pharmacy Act, it is true, will in future compel all who enter business on their own account to pass two examinations, but there are many engaged in pharmacy who will never become the owners of a business; consequently, we have no guarantee for their intelligence. Out of London I only know one establishment in which no apprentices are employed; in the majority there are no assistants, and in these, as a rule, the principal is seldom present, consequently, all the work is done by the apprentices, and I know many of them when their indentures or agreements are signed are quite ignorant of Latin. I know pharmaceutical chemists who receive as apprentices lads whose knowledge of English consists of not more than six words. Surely it cannot be said that in those cases education is a sufficient precaution. The Act has nothing in it to prevent a continuance of this state of things.

When I find your correspondents, one after another and week after week, asserting that every shop has now some regulation or another in use, I begin to doubt my own eyes and memory. I have, during my little experience of the trade, been engaged in some six or seven different situations, including a surgery and a workhouse infirmary, but have never known regulations or precautions whatever. I know where drawers were labelled in alphabetical order,—acacia, alumen, arsenic, etc., next one another in a row; bottles were arranged so that one shelf should hold white powders, another dark ones, thus arsenic and calcined magnesia (in one case the heavy), cantharides and powdered cubebs, etc., were next-door neighbours, liquids in the same order; these arrangements remain the same to-day. There are several on the Register who are well known to consider the pharmacy branch of their trade as of far less importance than the wine, spirit, beer and porter branch, and in their shops everything is made to give place to the drinkables, the young men having to leave bottles of mixtures partly prepared, to serve glasses of grog, etc.

My experience (for I write what I know to be true) thus tells me that regulations for the keeping of poisons are necessary, because of the want of education and the general neglect of any precautions.

The fact that frequent recommendations and fearfully narrow escapes have failed to convince many of the necessity of adopting any precautions is, I think, sufficient to prove that nothing short of stern compulsion will secure the general adoption of any rules that may be proposed.

Many object to the proposed regulations because they would include all the articles named in Schedule "A." Section 1 of Act declares the word "poison" to mean the whole of those articles. Any regulations which may be proposed for the "keeping of poisons," must, therefore (unless we have a new Act), apply to the whole list.

I hope the Council will persevere and succeed.

March 7th, 1871. D. W. JOHN.

Sir,—I am one of those who think that compulsory regulations as to the safe *keeping* of poisons are quite unnecessary. Many abler pens than mine have written on that point, therefore I will say nothing. But I wish to ask a question or two relative to the third clause in the proposed regulations, which says, "All liniments, embrocations and lotions containing poison, shall be sent out in bottles readily distinguishable by touch from ordinary medicine bottles."

Will a particular-shaped bottle be required, or can a piece of sand-paper be affixed to any ordinary bottle?

Is the rule to apply to the *sale* of laudanum, and such articles, or only to the dispensing of prescriptions?

If it only applies to dispensing, I think it is quite unnecessary, for as far as my experience goes,—and I have seen a good deal of dispensing,—it is already carried out in dispensing establishments, medicines for external and internal use being put in different shaped bottles. If it is intended to apply to the sale of such articles as laudanum, I venture to say it will be impossible to carry it out in many shops. In the neighbourhood in which I live the sale of laudanum and opium is of hourly occurrence, and we could not *give* a poison bottle when a customer came for a pennyworth or a halfpennyworth of it; and I am certain, in the majority of instances, the customer would not *buy* one.

Even supposing all the poisons mentioned in the schedule were sent out in poison-bottles, people could not be prevented using the bottles for other purposes when they had got them. Many people would take a fancy to the bottles, and make use of them for gin, vinegar, hair oil, etc., and *would* use them in spite of any Act of Parliament, even if you could get Parliament to pass such an Act, which is very improbable, and then what security would there be in "poison" bottles?

If laudanum has to be sent out in poison bottles, how is opium to be sent out? The sale of it is quite common in many districts, and it is usually sold in paper or pill-boxes; and it would be absurd to place such restrictions on laudanum and leave opium alone. Perhaps a particular shaped box would be required, or one covered with sand-paper.

Again, what is the use of applying such regulations to the poisons in the schedule when oil of vitriol, spirit of salt, aquafortis and a host of other dangerous things, can be sold by any person, in any quantity, without any restriction whatever?

Perhaps some supporter of the regulations will answer the above questions. ASSOCIATE IN BUSINESS.

Sir,—I think, before voting for or against the Poison Bill, we ought to know what is a poison. What is more absurd than to tell the public that camphorated chloroform, paregoric, syrup of poppies, cough lozenges, morphia lozenges, etc., are poisons according to the Pharmacy Act? The line must be re-drawn, and it must include all trades and professions, whether wholesale or retail.

When the word poison has been decided or clearly defined, then the feeling of the trade ought to be taken before the Society does anything in the matter.

What does the Society tell the public?

"That all chemists shall be examined, to show that they are educated and qualified to dispense medicines, etc., and that they are the only persons to sell poisons (under certain restrictions). They shall label the said poisons distinctly. The said label shall have the name and address of the seller on it." In the next place, if the Society does not protect the chemists in their legitimate business, why take their fees and yearly subscriptions? It is only fair that the chemists should have something in return for their money.

What chemist, with regard to his own safety, does not keep all virulent poisons away from other drugs, and have them distinctly labelled, not only while in stock, but when sent out, either as a prescription or recipe, and use blue bottles for lotions and poisonous applications?

If chemists are qualified by their examination, why impose these restrictions, which are not imposed on the grocer, oilman or drysalter, who sell more poisons than all the chemists in London?

Cases of accidental poisoning by chemists are very rare, in fact, scarcely known, considering the number of prescriptions they dispense. As a rule poisoning is attempted, or occurs through the poison having been sold by mistake by those who are not able to distinguish arsenic from carbonate of soda, much less give an antidote in case of emergency.

Lastly, as there is no law to compel a pharmaceutical chemist or chemist and druggist to be members of the Society, I hear that several of my friends intend to discontinue their subscriptions unless the Society looks better after their interests as the Society are compelled by law to place all pharmaceutical chemists, chemists and druggists, and associates on the Register, which Register shall be admitted in all courts of law.

An Associate of '53 by Examination.

A "*City Pharmacist*" writes to protest against submitting to an innovation "useless, foreign and tyrannical," to express his "confidence in Messrs. Brown, Bottle, Savage and Woolley," and to suggest that "the opinion of every chemist be taken by vote." In such case he believes the majority would pronounce against any "further interference" with the trade.

Sir,—To-day a gentleman handed me a prescription as follows:—

℞. Tr. Gentian. Co. f℥iiiss
Acid. Hydrochlor. Dil.
„ Nitric. dil. aa f℥ii.
M. ft. Guttæ.

Inquiring my charge for the same, on my replying 2*s.* 6*d.*, he withdrew the prescription from my hand, saying, "the charges in this town were exorbitant and out of all proportion; the mixture only contained gentian and hydrochloric acid, which would not cost more here than at Tunbridge Wells and other places, where he had paid 1*s.* 6*d.* for it."

I politely hinted that I thought such a charge would not be made at Tunbridge Wells, but he assured me the prescription had been dispensed there several times at that price.

Now I do think at the present time, when we are about taking upon ourselves increased duties as a protection to the public, such miserable charges should be abandoned, for surely no one conversant with our business will contend that 1*s.* 6*d.* is a sufficient remuneration for the above prescription; and any man charging this price does not act fairly either to himself or his brother chemists.

I should like to add a few words respecting the proposed regulations for keeping and dispensing poisons. I have read a great deal the last few weeks about the supposed hardships and annoyances to which the trade will be subjected, in case the proposed regulations become law. Now I feel sure a candid consideration of what they entail, when carried into practice, would strip them of half their terrors.

All will admit that at the present time more precautions are taken against accidents in the better-class dispensing businesses than in mixed country businesses; and although this partly arises from the supposed greater difficulty in carrying them out in the latter cases, I feel persuaded the will to do, together with a little ingenuity in the doing, would overcome all obstacles, and I speak with a practical knowledge of that class of business.

Could not the casks in the warehouse containing arsenic, sheep dipping, etc., be provided with lids and secured by a padlock? Also the acid. hydrocyan., the various alkaloids and their solutions, and the more potent poisons, be consigned to a cupboard, the key of which should be in charge of the principal, and only opened in his presence, or by his permission, instead of, as is too often the case at present, these things standing side by side with innocent preparations, probably on a shelf at the back of other bottles, with every chance of a mistake being made by a young apprentice. Then again, the laudanum bottle may be transferred from its vicinity to the Tr. Rhei to some corner, besides being rendered distinctive by a strip of sand paper or leather cap. Surely such precautions as these are not very onerous, and their observance must impress the mind of the apprentice with an idea of the potency of the articles he is using. If therefore it be once admitted that these regulations will be found practicable, I think we may dismiss any fears as to vexatious proceedings likely to be adopted to inquire into their observance, for the law has no terrors to those who carry out its provisions.

It has been strongly insisted upon by some that there is more need of these restrictions being placed upon public and private dispensaries than upon us; now this I fully endorse, but surely we should be able, with a much better grace, to ask that they should be extended to meet these cases, when we could point to our own observance of them. A few accidents like the one at Manchester, reported in a recent journal, would then add considerably to the force of our argument. I much regret to see so much personal ill-feeling imported into the discussion, as it only tends to make it more difficult to come to an agreement. I would like to see those who are in favour of the regulations speak out, and so strengthen the hands of the Council, who I am sure have only the interests of the trade at heart, and more especially as the same restrictions will fall upon them as upon us. I would also suggest that local secretaries should call together the members of the trade in their districts, to talk over the subject in a friendly way, which would do much, I believe, to smooth many difficulties, and would certainly tend to promote a better feeling between chemists in the same town, and allay much of the present trade jealousy.

W. H. P.

A Child Poisoned by Mistake at Manchester.

Sir,—In justice to Mr. Wild allow me to state that he (Mr. Wild) has for some time retired from practice, and consequently he was not "the man censured by the jury." The practice belongs entirely to Dr. Fox, who works excessively hard, and, to my thinking, should not have been rated for the pardonable omission of his dispenser. I know the class of patients Dr. Fox has to deal with, and I must say I never met with a more careless set in the course of my existence. The surgery is not an open one.

Herts, February 25th. A Medical Assistant.

"*Chemicus*" and *H. R. H.* are referred to the rule as to anonymous communications.

"*Boetis.*"—Dr. Hassall's is the famous work on food adulteration, but we do not recommend it.

J. S. R.—The substance of your letter has already appeared in this Journal more than once.

M. P. S.—It would be legal if the proprietor of the business be a Registered Chemist and Druggist within the meaning of the Pharmacy Act.

W. F. C.—See the letter on this subject from the Medical Officer of the Privy Council, Pharm. Journ. 2nd ser. Vol. X. p. 567.

W. J.—Pharm. Journ. 1st ser. Vol. II. p. 649; Vol. IX. p. 511.

A Member.—No.

"*Podophyllin.*"—We cannot assist our correspondent.

W. Rogers (Maidstone).—As a memorial addressed to the Council, the document of which copy is forwarded cannot be published before it appears in the proceedings of the Council meeting.

T. Padwick.—Oleate of soda.

F. O.—We cannot undertake to teach our correspondents the first principles of chemistry and mathematics, and would recommend the careful study of an elementary work on either subject.

"*Spes.*"—We think if our correspondent would carefully study the relative value of grammes and cubic centimetres, as compared with grains and grain-measures, the apparent discrepancy in the Pharmacopœia would be clear to him.

"*Rumex.*"—Epsom salt and salt of lemons are the correct terms.

G. W.—You will find a formula for syr. ferri bromidi in Pharm. Journ. 2nd ser. Vol. XI. p. 744, and one for vinum pepsinæ, 1st ser. Vol. XVIII. p. 197, or 2nd ser. Vol. VI. p. 192.

W. P.—You will find what you require in Ure's 'Dictionary of the Arts,' under the head "Silvering."

H. D.—(1.) For liniments it is; but not for any preparation for internal use by man or beast. (2.) You should give notice to the Registrar to make the alteration in the Register, for which no fee is charged.

J. P.—We should think Bonjean's preparation,—an infusion made with water and evaporated to a soft extract.

The following journals have been received:—The 'British Medical Journal,' March 4; the 'Medical Times and Gazette,' March 4; the 'Lancet,' March 4; the 'Medical Press and Circular,' March 8; 'Nature,' March 2; the 'Chemical News,' March 3; 'Journal of the Society of Arts,' March 2; 'Gardeners' Chronicle,' March 4; the 'Grocer,' March 4; 'Produce Markets' Review,' March 4; the 'English Mechanic,' March 3; Messrs. Longman's 'Notes on Books' for February; the 'New Lebanon Journal of Materia Medica' for February; the 'Food Journal' for March; the 'Brewers' Guardian' for March.

Communications, Letters, etc., have been received from Mr. C. Pierson, Mr. D. Hanbury, Mr. J. A. Forster, Mr. P. L. Simmonds, Mr. A. H. Mason, Mr. G. Edward, Mr. D. O. Evans, Mr. W. G. Scruby, Mr. A. W. Gerrard, Mr. A. Girdler, W. F. C., A. B. N., E. Y., J. C. B. M., T. D. M., "All Saints," "Alpha," "One in a Fix," "Quercus."

DISPENSING.*

BY W. J. HALLIDAY.

There are in Lancashire many large and important towns where little or no dispensing is done by the druggist, the medical practitioners dispensing their own medicines, and also such prescriptions of consulting physicians or surgeons as may come into their hands. The latter practice is very objectionable, and it is time the Pharmaceutical Council should use its influence to alter the system. Under these circumstances, how is an apprentice to learn dispensing? After he has fulfilled his term, and obtained a situation as assistant, he finds he has to commence learning what he should have had the opportunity of being taught during his apprenticeship.

Mr. Ince's remarks, made nearly twenty years ago, are applicable to the present time:—"The young beginner was apprenticed to a chemist because his parents thought it *such a nice clean business;* contrarywise, the tyro found himself immediately smothered up to his eyes in white, red and blue paint, not unlike the clown at Astley's, happy to present himself to society not too redolent of varnish, and, having escaped the oil-can on the one side and the blacklead on the other, allow a comprehensive apron to cover all deficiencies for seven long years. He then comes to London."

At the Pharmaceutical Conference held at Liverpool last year, the President stated "that the education of the present day was too superficial, the simple fact being that pupils neglected to learn how to spell. In the Crimean war many dispensers were thrown out because of their inability to spell even one-syllable words. Few persons who had not given special attention to this subject would credit the extent of the evil. He had examined a class of five boys supposed to be prepared for the preliminary examination, and, upon dictating a sentence of words of one syllable, none of the boys made less than three mistakes in the spelling."

Take an example of such an assistant in a new situation, where a prescription is given into his hands to dispense by an impatient customer. Say—

Mellis ℥j
Potass. Chlor. ʒj
Acid. Hydrochl. Dil. ʒij
Inf. Rosæ ad ℥viij.

The probability is he will overlook the infusion, and commence operations by weighing and measuring the other ingredients, and then, inquiring for the concentrated infusion, when told it is the custom to prepare fresh infusions, he is somewhat nonplussed; and if the customer is waiting, and of an irascible turn of mind, he will not find it a very agreeable duty to have to explain the cause of delay. And now for the infusion. If he has had no experience in preparing it, he will probably throw in the petals without separation; and when the medicine is prepared, in what style will he write and affix the label? for often much depends on the external neatness of a bottle of medicine.

I remember a case in point. A lady had a prescription dispensed, not at her regular chemist's, but at a first-class London house. In a short time she returned with the bottle, saying she had been accustomedto having her medicines delivered with clean labels.

Take another example, a young man who has had five years' experience in a house where dispensing is part of the ordinary daily business. He would read through the prescription carefully and intelligently, notice the infusion, tell the customer at once how long it would require for preparation. After making the infusion, he would copy the prescription, write the label, etc., and have all in trim for finishing off when the infusion was ready. The former instance is not unusual; and I believe pharmacists, as a rule, prefer assistants from parts of the country where at least a moderate share of dispensing is done.

In the towns referred to, the druggists make better way in the world and secure the reward of their labour earlier than those whose business is principally dispensing; their returns are much larger, and the variety and extent of stock kept would astonish a West-End chemist who has had no experience in country trade.

Since the passing of the Pharmacy Act, it is imperative that every young man must pass two examinations before commencing business. It has been proposed that the Preliminary should be passed before the youth is articled, which is a very good suggestion. In the second, or Minor examination, there is a pharmacy bench, where each candidate is examined practically in dispensing; and to pass he should be well up in that department, which is of the utmost importance for the future welfare of pharmacists. I would, therefore, suggest to this Society the advantage of having a dispensing-counter, where associates might obtain a knowledge of dispensing. There need be little expense about the medicines or apparatus required. A knowledge of Continental pharmacy might be obtained in this manner.

I will very briefly call your attention to a few instances of dispensing, commencing with mixtures. A slight difference in colour is often immediately noticed by the patient, and requires an explanation. To prevent this, it is very needful to have everything scrupulously clean about a dispensing-counter. A good flow of water is generally more useful than a fluffy towel in cleaning a measure or mortar, and it is my rule, where practicable, to rinse a bottle before dispensing a mixture. It is well known that gallic acid and water should be a colourless mixture, but by carelessness in the use of scales, measure or mortar not properly cleaned, it may become coloured; and one containing iron may be spoiled if any tincture containing tannin comes into contact.

Where practicable, perfect solution of soluble salts should be made, for even in the simplest form of mixture containing potass. bicarb., syr. aurantii et aquæ, I have seen the bottle wrapped up for delivery with the potash undissolved and the syrup unmixed.

The other day, I dispensed a mixture containing

Potass. Bromid. ʒvj
Tinct. Aurant. ℥iij.

When the medicine required to be repeated, half of the bromide remained in the bottle.

In mixtures containing potassæ bicarb. and acid. citric. or other effervescing salts, the effervescence should be effected first before the tinctures or syrups are added, and in as little water as possible to form the solution; if so, the saturation is completed more rapidly than by adding all the water, besides pre-

* Read at a meeting of the Manchester Chemists and Druggists' Association, March 3, 1871.

venting an explosion from excess of carbonic acid when the cork is drawn.

The dispensing of pills is not very popular, yet their use is extending; not so much in the old way of an aperient to accompany a mixture, but in usurping the place of mixtures altogether. A few pills sometimes contain several alkaloids requiring great care in manipulation, and, like all other pills, should be of uniform size and shape. In dispensing pills containing extract. nucis vomicæ, strychnia or other powerful ingredients, an excellent plan is to add a few grains of sugar of milk to pulverize the extract, or subdivide the alkaloid before mixing with the excipient, by which means more equal division of the active ingredient is obtained. When pills are repeated, they should be dispensed the same size as before, the 'q. s.' required should be noted for reference. Minute pills, containing one-eighth or one-fourth of a grain of alkaloid might be increased with advantage to a standard size of one grain by the addition of sugar of milk.

Powders should be weighed, and not guessed by what has been termed the rule of thumb.

Liniments and lotions require no special notice; but in dispensing liniment. chlorof. or camphoræ it is needful to have dry bottles, as the least addition of spirit or water prevents a bright liniment.

Most of the formulæ in the B. P. are prepared to a definite quantity of twenty ounces, but in the preparation of linim. camph. comp. the old formula has been copied. Thus,—

Camphoræ ℥ijss
Ol. Lavand. ʒj
Liq. Ammon. Fort. ℥v
Spt. Vini ℥xv,

forming liniment. ℥xxijss, as camphor in solution, equals its weight.

℞ Hydrarg. Perchloridi gr. ij
Hydrarg. Subchloridi gr. xx
Aquæ Calcis ℥ij.

A lotion prepared from this prescription may be dispensed of two colours. If the calomel is mixed first, and a solution of sublimate, often kept for convenience, added last, a black deposit—black oxide of mercury—is formed; but if the sublimate is dissolved in the lime water, and the calomel added afterwards, the red oxide is deposited.

Ointments are often prepared on a slab; in most cases a mortar answers better. I passed through Clerkenwell some years ago, and observed an abortive attempt made to prepare about 2 lb. of ung. sulph. co. on a slab, the hellebore and sulphur were in distinct lumps, and the lard frigid. How much more satisfactory had the powders been mixed in a mortar, and melted lard added!

An ointment from this formula is more frequently dispensed by mixing; but a better plan is to melt the lard, add the oil, and when nearly cold stir in the precipitate:—

Hyd. Nit. Ox. Lev. ℈ij
Adipis,
Ol. Amygd. aa. ℥j.

Expressed oil of mace and other fatty substances mix much better with lotions if previously melted than if rubbed cold.

Ung. potassii iodidi, ung. hydrarg. perchloridi are best prepared if the salts are dissolved in a little water in a test-tube, and ung. camphoræ can be prepared perfectly smooth if the camphor is dissolved by a gentle heat in the lard.

I should like to caution young men against commencing business too early in life. They had much better gain experience in London, or some other large town, and, if possible, obtain a knowledge of Continental pharmacy in France or Germany; and a term of engagement in the marble palaces called drug stores in the great continent of America might not prove useless.

SPIRITUS AMMONIÆ AROMATICUS.

BY JOHN T. MILLER.

In the last number but one of the Journal there is an article on spiritus ammoniæ aromaticus, in which it is stated that this preparation "ought to contain the ammonia in solution as the normal ammonium carbonate." That the authors of the official process entertained the same notion may be inferred from the construction of the formula.

Some time back, I noticed while distilling this spirit that ebullition was preceded by considerable effervescence. This fact led me to examine the composition of the distillate, which proved to be, as I had suspected, strongly basic,—a result which subsequent experience showed to be invariable. Indeed, so large is the excess of base in sp. ammon. aromat. B. P., that we shall not be far wrong in regarding it as a solution of

$$2NH_4HO + (NH_4)_2CO_3.$$

Variations in the composition of the product, but not, probably, to any great amount, may be expected to attend different conditions of manufacture.

The statement of Dr. Divers, that by following the directions in the British Pharmacopœia, "the formation of a spirit containing excess of ammonia is favoured but to only a *small* extent," falls so short of the mark, that I can hardly imagine it to be founded on actual analysis.

The writer in the Journal goes on to remark that in the older preparation—sp. ammoniæ *comp.*—the essential oils were mixed with spirit of ammonia, "this latter preparation being prepared by the double decomposition of sal ammoniac and potashes dissolved in proof spirit, and a certain quantity distilled. It would, therefore, contain the ammonia in solution as a mixture of the normal and acid carbonate."

I venture to say, however, that this argument is fallacious, and that the spirit in question contains *basic* ammonium carbonate.

I would refer those interested in the matter to a paper of mine in the number of the Journal for January, 1867.

Dangerous Drugs.—Women will meddle with dangerous drugs, notwithstanding the fatal consequences that have so often resulted from their recklessness. Because a child was cross, a Liverpool midwife, named Margaret Cunningham, gave it five drops of laudanum, which effectually stopped its cries, for the infant died. It is a pity women like Cunningham cannot find some better mode of quieting children than poisoning them. At an inquest the jury returned a verdict that the deceased had died from an overdose of laudanum "unskilfully administered," and the coroner cautioned the woman.—*Liverpool Courier.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Ferri et Ammoniæ Citras.—Solution of persulphate of iron is precipitated by pouring it into an excess of solution of ammonia—

$$Fe_2 3SO_4 + 6NH_4HO = Fe_2 6HO + 3(NH_4)_2SO_4.$$

The ferric hydrate thus thrown down is collected on a calico filter, and washed with distilled water until the filtered liquid gives no indication of sulphate of ammonium when tested by solution of chloride of barium. The hydrated oxide of iron is then dissolved in a solution of citric acid, and ammonia added in slight excess. The filtered liquid, evaporated by a very gentle heat to a syrupy consistence, and spread thinly on plates, forms scales which should readily shake off on drying.

There are several little points in this process which are deserving of attention, as students often fail to obtain a satisfactory product. In the first place it is essential to pour the solution of iron into the solution of ammonia, not *vice versâ*. The object of this device is that the ferric sulphate, by coming into the presence of considerable excess of ammonia, may really undergo the decomposition expressed in the equation above; that is, that it may be transformed into pure ferric hydrate. If the ammonia is poured into the solution of iron, the ferric sulphate undergoes a decomposition which is incomplete, for the precipitate contains a very appreciable quantity of sulphate, carried down in the form of an insoluble oxysulphate of iron. The composition of the precipitate is, of course, very variable, but the general nature of the change is shown by this equation—

$$Fe_2 3SO_4 + 4NH_4HO = Fe_2SO_4 4HO + 2(NH_4)_2SO_4.$$

Hydrate of iron mixed with such impurity, when dissolved in citric acid and ammonia, furnishes a granular semi-crystalline product, not the usual brilliant scales. The proportion of citric acid must also be adhered to, or the solution, on evaporation, will often become turbid and yield a compound only partially soluble in water.

Several combinations of citric and tartaric acid with peroxide of iron have been employed for a long time in medicine. They are, however, inferior to the ammonio-citrate in richness and brilliancy of colour, and in solubility. Nevertheless, it is obviously improper to substitute this, or any other salt, when ferri citras or ferri tartras is ordered in a prescription. Any little difficulty in effecting solution, if it should occur (which is, however, unlikely), may be got over as recommended by a correspondent of this Journal ("Notes and Queries," p. 437), by warming the salt with distilled water in a test-tube.

[§ Heated with solution of potash, it evolves ammonia and deposits peroxide of iron. The alkaline solution from which the iron has separated does not, when slightly supersaturated with acetic acid, give any crystalline deposit. When incinerated with exposure to air, it leaves not less than 27 per cent. of peroxide of iron, which is not alkaline to litmus.] The former of these tests serves to detect the fraud when tartaric has been substituted for citric acid, and the latter shows that the preparation contains no potash.

Ferri et Quiniæ Citras.—Solution of persulphate of iron is precipitated by excess of solution of ammonia, and the washed precipitate is dissolved in solution of citric acid, employing the same precautions as in making ferri et ammoniæ citras. Similarly, sulphate of quinine, previously dissolved in a little dilute sulphuric acid, is mixed with solution of ammonia in excess, and the precipitated hydrate of quinine collected and washed. It is then dissolved in the solution of citrate of iron already prepared. A little ammonia is then added to the solution, not, however, sufficient to precipitate the quinine, but leaving the solution slightly acid. Finally, the liquid is evaporated down to a consistence suitable for scaling on plates.

[§ Thin scales, of a greenish golden-yellow colour, somewhat deliquescent and entirely soluble in cold water. The solution is very slightly acid, and is precipitated reddish-brown by solution of soda (a mixture of the hydrates of iron and quinine), white by solution of ammonia (hydrate of quinine), blue by the yellow and red prussiates of potash, and greyish-black by tannic acid.]

This compound contains both ferrous and ferric salt, since it gives a deep blue precipitate with red as well as with yellow prussiate of potash. Part of the citric acid, in fact, reduces some of the iron to the ferrous state, becoming itself converted into a mixture of acids which have not been closely examined. Without this reduction the scales are not of the usual greenish-golden colour. The addition of a very small quantity of potash is said to favour it, though this is not recognized by the Pharmacopœia, and is precluded by the test there given. [§ When burned with exposure to air, it leaves a residue which, when moistened with water, is not alkaline to test-paper.] It should contain 16 per cent. of quinia, unmixed with cinchonia and quinidia. [§ 50 grains, dissolved in a fluid ounce of water and treated with a slight excess of ammonia, give a white precipitate, which, when collected on a filter and dried, weighs 8 grains. The precipitate is almost entirely soluble in pure ether, and, when burned, leaves but a minute residue.] This quantitative test as indicated in the Pharmacopœia is defective, because it does not give sufficient detail. No mention is made of washing the precipitate, nor of the temperature at which it should be dried. Both these points should be clearly defined, or very untrustworthy results will be arrived at. The temperature at which hydrate of quinine gives up the whole of its combined water, and becomes anhydrous, $C_{20}H_{24}N_2O_2$, is about 260° F.; the precipitate should be dried at this temperature.

From recent analyses of the commercial salt supplied by different makers, it appears that the amount of quinia introduced varies very considerably, in some cases not exceeding one-fourth of the official proportion. As stated already, great injustice may be done in such analyses unless conducted with due precautions.

Ferri Iodidum,—[§ Iodide of Iron, FeI_2, with about 18 per cent. of water of crystallization and a little oxide of iron.]

Iron wire, iodine and distilled water are digested together till the colour of the iodine has disappeared; the solution is then filtered into a clean iron dish, and rapidly evaporated till a drop removed on the end of an iron wire solidifies on cooling. It is then poured out upon a porcelain dish, and, when solid, broken up and put into a bottle.

Ferrous iodide forms a greenish solution, which gives the usual reaction of ferrous salts with red prussiate of potash, resulting in the formation of a deep blue precipitate.

$$3\,\dot{Fe}I_2 + K_6Fe_2Cy_{12} = 6\,KI + Fe''_3Fe_2Cy_{12}.$$

Iodide of iron is a deliquescent substance and soon absorbs oxygen from the air, giving a brown mixture of iodine and a ferric hydrate-iodide, which is insoluble in water. In this state, particularly if it shows signs of containing uncombined iodine, it is unfit for use in medicine, but should be digested with water and iron wire, and when the brown colour of the liquid has disappeared, filtered, and once more evaporated to dryness.

The syrup is an important preparation. In making it, it is essential to follow closely the instructions of the Pharmacopœia and to employ the *purest* sugar.

BISMUTHI SUBCARBONAS.

BY T. P. BLUNT.

It may not be generally known that the commercial "subcarbonate of bismuth" (Bismuthi Carb. P. B.) contains an appreciable quantity of silver, in the form of chloride.

I have been in the habit for some time of preparing liq. bismuthi by the solution of the above salt in nitric acid, and though samples from various sources have been used, there has always appeared a heavy and very finely divided sediment, which passed with readiness through a filter, and could only be removed by subsidence and decantation; as this proved a source of some annoyance, I determined to ascertain the nature of the insoluble matter, when it was found as above stated, to consist of chloride of silver.

The amount was ascertained as follows:—

1000 grains of the subcarbonate of bismuth were dissolved in nitric acid, the sediment allowed to subside, and the supernatant fluid decanted off as closely as possible, the residue was washed with nitric acid by decantation, and a large excess of strong ammonia was then gradually added, the precipitated oxide of bismuth was thrown on a filter and repeatedly washed with ammonia water.

To the filtrate a slight excess of nitric acid was added, the precipitate collected on a filter in the usual way, dried, ignited in a porcelain capsule, treated with nitro-hydrochloric acid, and again gently ignited; it weighed 1·3 grains, representing 0·98 grain metallic silver, or about 0·1 per cent. This proportion is obviously of no importance from a therapeutic point of view; it might, however, be worth while for large makers to separate it in the course of manufacture, as might readily be done by some such process as that given above, without any loss of bismuth.

THE PRECIPITATION OF QUINIA BY IODIDE OF POTASSIUM FROM ACID SOLUTIONS.*

BY J. M. MAISCH.

Some time ago the following prescription was received:—

℞ Quiniæ Sulphatis gr. xv
Potassi Iodidi ʒi
Tinct. Ferri Chloridi ʒi
Aquæ ℥iv
Syrupi Zingib. ℥i.
M.

The quinia salt was dissolved in the tincture of iron, the potassium iodide in the water, and the solutions mixed; a brown precipitate was at once formed. The quinia salt was now dissolved in the water with the addition of a little dilute sulphuric acid, the iodide added, and after solution had taken place, the tincture of iron; the same result was produced.

It was now supposed that the iodide might contain some iodate, that on the addition of an acid, iodine was liberated, which, with the excess of iodide, would form biniodide of potassium, and that the precipitation occurred in consequence of the presence of this compound. But when the solution of the iodide (Atkinson and Biggar's) was acidulated with muriatic acid, a reddish colour was not produced, nor would starch paste brought in contact with the liquid acquire a blue colour; iodic acid was therefore not present.

Righini stated (*Journal de Chim. Méd.* vol. xiii. p. 116) that bisulphate of quinia produces with iodide of potassium a red pulverulent precipitate.

A considerable quantity of iodide of potassium was dissolved in a solution of one part of sulphate of quinia in twenty of water, the solution of the latter salt having been effected with just enough dilute sulphuric acid. A white precipitate was the result, doubtless owing to the presence of some quinidia in the quinia salt; for a solution of one part of quinia sulphate in forty of water, effected with a sufficient quantity of sulphuric acid, remained clear on the addition of iodide of potassium in substance. When a considerable excess of pure sulphuric or muriatic acid was used for dissolving the quinia, the addition of solution of potassium iodide occasioned no turbidity or sediment; therefore the observation of Righini is not correct as far as it relates to neutral potassium iodide.

A solution of sulphate of quinia (1·40) with just sufficient acid was prepared, iodide of potassium added, and then solution of citrate of iron; a white turbidity with the gradual production of a bright red precipitate was the result.

The same quinia solution was made, except that a considerable excess of dilute sulphuric acid was used; after the solution of iodide of potassium had been effected, every drop of the solution of iron citrate occasioned a brownish-white precipitate, which rapidly changed through various shades into deep brown. If the order of mixing was reversed, the potassium iodide yielded with dilute sulphuric acid a colourless solution, which became turbid and turned brown with the iron citrate, and now yielded with

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* Read before the Philadelphia College of Pharmacy, at the Pharmaceutical Meeting, Dec. 20, 1870.

solution of quinia a darker coloured precipitate, changing more readily.

If an aqueous solution, or the tincture of sesquichloride of iron, diluted with water so that the iron colour can scarcely be perceived, is mixed with solution of potassium iodide, an iodine colour is at once produced, doubtless owing to the formation of ferric iodide: $Fe_2Cl_8+3KI=Fe_2I_3+3KCl$. But since in a mixture of solutions of different salts the acid and bases interchange in part, provided an insoluble compound be not formed, a mixture of the two solutions must contain Fe_2Cl_3, Fe_2I_3, KI and KCl; the third equivalent of iodine in Fe_2I_3 being but loosely combined, we have in the above mixture practically KI_2, and obtain with it in quinia solutions the same precipitate which we observe on the addition of Lugol's solution.

The appearance of the red or brown precipitate which, according to Righini, contains quinia, hydriodic acid and iodine, depends therefore on the presence of KI_2, or if KI be used, on the presence of some other compound producing the former.

The precipitate obtained in putting up the above prescription, after having been well washed with water, forms a brown powder having a slight odour of iodine, which is slowly evolved. When the precipitate is treated with ammonia, it changes to a dull cinnabar colour; dissolved in acids, it yields a copious precipitate with iodohydrargyrate of potassium. Heated upon platinum foil, it decomposes, leaving a bulky charcoal, which is burned with difficulty without leaving any residue behind. The precipitate therefore contains, beside the elements of quinia, only iodine.—*American Journal of Pharmacy.*

THE BOTANICAL STUDENT'S DREAM.

"Ridentem dicere verum
Quid vetat?"

It was the middle of February, and I hoped to pass the Minor Examination in May. I had devoted my winter evenings to botany, and was endeavouring to create out of Bentley and my own inner consciousness a correct idea of a plant. It was my off-duty night, and, after a good spell of reading, I found that my notions, instead of clearing up, became more and more confused and complicated. Suddenly it came into my head that I was a primordial utricle, and how to get out of my cell, notwithstanding its walls were but cellulose, was more than I could accomplish. But no, that was not it; a painful sensation across the chest made it evident that I was a cell myself, and that the hour-glass constrictive, preparatory to a division into two cells, was taking place. Though painful, this did not otherwise distress me, when I heard a rushing noise—(was it a cytoblast?)—and, presto! the perfect image of my thoughts,—my ideal plant was full in view before me. Alas! what a Frankenstein had I brought to life, or to death in life! No old oak wild and gnarled, worn with the storms of five hundred winters, ever looked so weird and ghostly to the belated traveller as he passed it in the thickening twilight as did my unfortunate creation. Its arms were stretched out as if to seize upon its author, but the cell division being now completed, I slid easily out of the way. I saw what a frightful abortion I had produced. Was it an exogen with the wrong side out, or an endogen with the wrong side in? The fibro-vascular bundles were rattling loose like old bones, and the bark of the trunk, where there was any, was altogether unlike bark. Surely the liber must have got outside the epidermis, owing to its being made out of a book. The petioles were at the wrong ends of the leaves, and the peduncles had no work to do. The lacteals were leaky, and my nose assured me they were distilling assafœtida; but if so, why were they in the stem? The conversion of the elements of leaves into flowers was going on badly; some had got as far as stamens, and were intended to be hypogynous when the ovary arrived. The process had followed the too frequent example of higher organizations, and become a case of cryptogamy. There were old carpels hanging about, which ought to have dehisced long ago,—septicidally probably, suicidally most likely. The seeds were all loose, so I supposed the dissepiments did not fit, or the placentation was not correct. There were spines in abundance,—naturally enough in this case, for the development of the leaf-buds had proceeded upon false principles. Involucres, bracts, spathes and glumes were stuck about here and there, looking as out of place as bills upon a lamp post.

One thought pleased me at last—the roots were hidden out of sight. Consequently, whether they were true roots or adventitious I did not care; whether rachis or underground stem, whether bulb, corm or tuber, it mattered not; and, as long as my own medulla was safe, it was a toss up whether there should be any in the root or not.

To complete my confusion, I now saw approach the venerable but slightly aquiline form of the examiner in botany, and on his coming the miserable spectre I had raised fell to pieces like a disarticulated skeleton. He saw my embarrassment, and, picking up one of the fragments, asked me, in a gentle voice, "What is *prosenchyma?*" I hesitated. I, who had been using it—alas! too freely, from a book mind, as I afterwards remembered. I was brimful of hard and uncomfortable words as good companions to each other as teasel heads or thorn-apples, which nevertheless kept shifting about as in a kaleidoscope; but this one *would not* come into the field of view. I answered at a venture, "*Protoplasm.*" He gave me just one look, stern but full of pity, and the expected collapse took place.

It might have been a few minutes or a few hours afterwards that I saw a graceful maiden, with a golden glory round her head, walking towards me. "Youthful student," she said, "I know your troubles, and am come to help you. My name is Clytie. The sun whom I follow has risen, and I will take you to the fields where grow the anemones and primroses and the yellow daffodils. We will follow his course till night, and before he sets, you will learn more of the glories of flower-land than books will ever teach you." So we went forth with the sun, and picked the earliest blossoms wet with dew. As he got high others unfolded, and the green leaves overhead and the grass below, the leafy hedgerows and mossy banks, all had something to tell and something that could be remembered. And the bees entered the flowers, to show us where were the nectaries, and got covered with pollen-grains, till they were as dusty as millers. We saw, too, the colchicum leaves, like bundles of spearheads, in the meadows; and the feathery hemlock, with its livid stems, lurking by the hedges; the viscid henbane on the chalky upland; the dark green belladonna; the dandelion, despised among herbs yet honoured pharmaceutically, its seed-heads a botanical study; the tall foxglove, with its cups for the fairy folk; and the malefern, with its crown of unfolding fronds, a model of graceful beauty; and the sycamore seeds springing up in the shade where grass did not grow, taught the secret of cotyledons, and other lessons were quickly learned. And the odours were crushed out under-foot,—the allium, fine but somewhat high; the wild thyme, fresh and sweet; whilst the scent of the anthoxanthum, sweetest in death, was borne far away down the wind. And so, as the sun westered, the world of flowers had acquired a new meaning; and my spoils grew heavy, and—but the fate that befalls walking philosophers and star-gazers in general befell me. Whether it was a stump or a bramble I do not know, but my forehead came into sharp contact with—the ground, I was about to say; but no, it was the corner of that 'Bentley' lying on the table. And so I awoke.

Moral.

If you want to learn botany, do not begin by studying an advanced work on the subject, and by cramming yourself with names and details that, if you have a good memory, may enable you to pass your examination, but which, unless you have struck the keynote of your work, will very probably be soon afterwards forgotten, or reduced to the state of jumble portrayed above.

Instead of this, provide yourself with a pocket lens and a sharp penknife; take an early walk into the country, and bring back a few common flowers, pulling them up by the roots. A buttercup will do excellently well to begin with, as it is a representative of the first Natural Order, and is a good plant to work upon. Examine it carefully by the aid of a simple elementary work, such as Oliver's 'Lessons in Botany,'—a cheap book,—and by the time you have got through a few common plants and a few chapters of your book, you will begin to take an interest in your subject, and will be glad to turn to the pages of 'Bentley' for further and necessary knowledge, —a book which, if taken up first-hand is "worse than Greek" to many. By pursuing this course, you will be learning at the same time both systematic and structural botany,* and, as far as the mere examination goes, you will gladden the heart of your examiner by showing him that you practically understand your subject, and that, even if your knowledge be limited, it is sound. Beyond this, however, and what is of far more importance, you will obtain some real insight into botany, which will not be merely ornamental, but will be of direct personal utility as long as you follow the pharmaceutical profession.

WILLIAM SOUTHALL.

* To any one desiring to pursue English botany further, I should recommend Bentham's 'Handbook of the British Flora.' There are pharmacists among us, men of our own order, who are specially qualified to write an introductory treatise on botany more immediately applicable to the wants of pharmaceutical students. Oliver's instructions are too limited in their range; his work might be amplified to great advantage in our particular direction. Whoever (and names rise instinctively to the mind) deigned to contribute such a manual would confer an incalculable benefit on many a perplexed student, and effectually prepare him for the full enjoyment of more advanced abstract compendiums.

REPORT ON THE CULTIVATION OF CINCHONA AT DARJEELING FOR THE HALF-YEAR ENDING SEPTEMBER 30, 1870.

FROM C. B. CLARKE, ESQ., M.A.,

Officiating Superintendent, Botanic Garden, and in charge of Cinchona Cultivation in Bengal, to the Officiating Secretary to the Government of Bengal, General Department.

The season has been unusually wet, the rainfall having already (25th October) amounted at the inspection bungalow to 200 inches, whereas the total fall for the year averages 180 inches only. The health of the plantations of *C. succirubra* and *C. calisaya* has remained good, and their growth satisfactory, though somewhat less than that of the preceding year. But *C. officinalis* has suffered more than during previous rainy seasons, and all hope must be abandoned that this species can be grown to an economic profit at Rungbee.

Taking the plantation called the 5th in the tabular report, which represents best the present centre of the plantations, it will appear that the average growth of the measured plants of *C. calisaya* for the half-year has been 36 inches, and that of *C. succirubra* 22 inches. The latter, from accidental circumstances in choice of the plants measured, is too low, and does not represent fairly the growth of plants of that age in that part of the plantation. The best plants of *C. succirubra* and *C. calisaya* have, within three years of planting out, surpassed 20 feet in height. No measurement is given of *C. officinalis;* it may be said generally of the older plants that some 40 per cent. perished during the last six months, and that those which survived did not grow. The number of plants of *C. officinalis* has been by estimation reduced from 930,704 on 31st of March, 1870, to 440,000 on 30th of September, 1870, but it would be best, in any calculations regarding these plantations, to write off these 440,000 at once; for, though some of them may survive for years, there is no probability that any profitable result will ever be derived from them.

Throughout the *C. officinalis* plantation, below 4500 feet level, *C. succirubra* was planted in 1869 in order to utilize the area, kept clean at considerable expense. These young *C. succirubra* promise exceedingly well.

The 164,615 plants of *C. succirubra* planted out during the early part of the six months under report were required to fill up the 1000 acres of that species as designed by Dr. T. Anderson. The 33,101 plants of *C. officinalis* were put out at a higher level (5000 feet) than before as an experiment.

By far the greater portion of the coolie labour is spent in scouring the young plantations during the rains. In order to ensure a sufficient supply of labour at this period, it is necessary (as in the surrounding tea plantations) to maintain the coolies during the year, so that during the cold weather it has been difficult to devise sufficient employment for them. The cold weather is the best time for planting out; and in accordance with Dr. T. Anderson's advice, it is proposed, during the ensuing cold season, to employ them in planting out *C. succirubra* in a rough way on some portions of the reserve, which are at too high a level for *C. calisaya* to thrive upon. And it is for this purpose that a considerable quantity of *C. succirubra* seed has been raised, put down at 500,000 (including some stock raised by cuttings).

C. calisaya has set its seed very favourably during the last two months. This seed should ripen in the course of next spring: and it is hoped that in future the quantity of seed produced will be sufficient to enable the extension of *C. calisaya* in any quantity that may be thought desirable.

Rungbee, near Darjeeling,
October 25th, 1870.

NOTE ON AROMATIC SULPHURIC ACID (U.S.).

BY JOHN W. EHRMAN.

Every dispenser is acquainted with the objections which may be brought up to the present officinal formula for aromatic sulphuric acid. As the committee on revision of the pharmacopœia is now in session, it is to be hoped that the formula under consideration may be modified, and with it several others of a like nature.

The aromatic sulphuric acid is used most extensively as a solvent for sulphate of quinia, in prescription, usually with watery or syrupy vehicles. When prescribed alone for the medicinal effects of the acid, it is not unfrequently diluted in order to modify its taste, and, avoiding the use of drops, to render its administration more convenient.

Now, when the elixir of vitriol is associated in this manner with watery fluids, the colouring and extractive matter becoming insoluble in the menstruum, precipitates, and the result is a muddy mixture instead of the clear solution we should otherwise obtain. But the elixir of vitriol, even undiluted, is constantly undergoing change, with the continual deposition of a bulky precipitate, so that it can be dispensed in a bright condition only by frequent filtration. This, of course is exceedingly annoying, and it is a reproach to the progress of pharmacy that the formula has been so long retained without material change. The old method of preparing it by exhausting the powders with the mixed alcohol and acid is preferable to that now employed, as it gives a preparation less prone to deposit by standing. The other objections, however, apply to this with equal force; for the ingredients afford to the menstruum principles which must of necessity separate upon dilution.

In revising this formula we should keep in view the fact that the resulting preparation should be miscible with water without precipitation, hence aromatics of an oleo-resinous nature cannot be used.

The following formula we have used for some time, and have found entirely satisfactory:—

Take of Sulphuric Acid, 3 troy oz.
Fluid Extract of Orange Peel, 1 fl. oz.
Red Rose Leaves, 2 drchs.
Boiling Water, 1 fl. oz.
Alcohol, a sufficient quantity.

Add the acid gradually to half a pint of alcohol, and pour the boiling water upon the rose leaves; when both liquids have become cool unite them, add the fluid extract and sufficient alcohol to make up the measure of eighteen fluid ounces. Mix thoroughly and filter.

Elixir of vitriol, thus prepared, has a pleasant aromatic odour and flavour, and the beautiful red colour of the rose leaves, heightened by the presence of the acid. It is miscible with water without turbidity, and a specimen, after long keeping, has deposited but a trace of sediment.—*The Chicago Pharmacist.*

WEST INDIAN MEDICINAL PLANTS.

Many plants not ordinarily recognized possess almost magical powers in the relief and cure of diseases, and are worth further investigation, and many that were only a few years ago considered of no value, are again brought into use in the West Indies. I will here allude to but two. The little herb (*Verbena officinalis*) generally known in the Bahamas by the name of blue flower, is acknowledged to possess some medicinal qualities.

The Spanish name yerba sacra, holy herb, is assumed in consequence of its acknowledged and undeniable virtues; it has been in use in the West Indies as a remedy from time immemorial.

The vervain possesses diaphoretic, diuretic, laxative, anthelmintic, and antiseptic powers. For children it is one of the best preventives against worms. By making a decoction or infusion of the leaves once or twice a week, and giving this instead of their ordinary drink for breakfast, it will keep the bowels regular, the skin free and moist, and they will not then be so frequently troubled with those obnoxious companions. If this plan were generally adopted, we should hear less of children dying suddenly or being attacked with convulsions.

The expressed juice of the whole plant also serves as a gentle purgative, by taking a tablespoonful for an adult every hour till it operates. Externally applied, the juice is found to be of no little value in healing fresh cuts and wounds, where no proud flesh exists. But it developes its qualities in a most marvellous manner in the cure of fevers, especially those of the putrid kind, such as yellow fever, black vomit, etc., cleansing and purifying the system so completely and in such a short time, and in many instances where all other remedies have failed to perform a cure, as would astonish the most sceptical and unbelieving.

Dr. A. Jackson, a physician of Nassau, Bahamas, states that he has used it extensively in his practice for many years and with success. He cites numbers of cases, and one of putrid fever was cured in eight days, the principal ingredient being *Verbena*. Mr. Kenneth Matheson, British Vice-Consul at Bolivia, in a letter to the Governor of the Bahamas, dated April, 1853, states that the plant was proved to be "a cure for yellow fever and black vomit, and that it was successfully used in restoring to perfect health many persons afflicted with that disease who had been declared by several medical practitioners to be in a hopeless state. The medical men likewise have adopted the same remedy with perfect success." He then continues to say, "that in Jamaica it was also proved to be a remedy of great value in this disease, having been tried and found as successful."

Another plant, called locally the Bitter Bush (*Eupatorium sp.*), is stated in Jamaica to be a remedy for cholera.

The class of plants arranged under the head "*Eupatorium*" is as varied and extensive as the surface over which they are scattered,—species of it being found in every climate and situation throughout the known world. Whether they all possess similar principles is a question to be decided only by time and inquiry. There are many species described as indigenous to Jamaica and the other West India Islands, namely:—

Eupatorium parviflorum; diffusum; macrophyllum; villosum; nervosum; cordifolium; montanum; rigidum; macranthum; Dalea; trifidum; conyzoides; atriplicifolium; repandum; sinuatum; obtusifolium; cotinifolium; triplinerve; ivæfolium; stœchadifolium; myosotifolium; spicatum; furcatum; cubense; sophiæfolium.

Of these, only three have been as yet applied as a remedy in cholera. Two, which appear to be *E. nervosum* and *E. villosum* in St. Catherine's and the neighbouring parishes, and *E. rigidum* on the north side of the island.

In collecting the plant, the best mode of proceeding is to gather it after the dew has disappeared; and as soon as a sufficient quantity has been collected and brought in, and whilst fresh, cut the small branches, with the leaves on, in lengths of 8 or 10 inches,—put them in straight lengths, then tie them up in bundles of half a pound and pack them close in a clean box. When the bush is allowed to remain for a few hours the leaves become dry and crumble into dust when handled. The name of Bitter Bush is applied indiscriminately in St. Catherine's and some other parishes in Jamaica to several species of *Eupatorium*, and in St. Ann's and other parts Christmas Bush is in like manner applied to tho same plant.

These several species of *Eupatorium*, variously called Bitter Bush and Christmas Bush, have been used in all stages of cholera with invariable success.

The *Eupatorium* leaves none of those dangerous permanent unpleasant symptoms produced by opium, lead, zinc, calomel, or by the saline treatment alone. Suppression of urine never occurs, but, on the contrary, when that painful and dangerous symptom takes place after the use of other remedies, a dose or two of the decoction immediately relieves the patient. It is a remedy at every man's door in the tropics, and requires no other preparation than is necessary to make any other bush tea. Boil two drachms of the bush in a pint of water into a strong decoction, let it get quite cold, and, in case of cholera, give a small teacupful (two or three ounces) every half-hour until the symptoms are checked; then extend the time (according to the severity of the symptoms) to every hour or second hour until the symptoms are entirely abated.

In simple diarrhœa give the same quantity every hour or second hour, according to severity of the attack,—but seldom more than one or at most two doses are required.

It is, perhaps, as well to give a caution against the use of the decoction as a preventive. The *Eupatorium* is a remedy in the existing disease, but the use of it as a preventive will be more injurious than otherwise.

P. L. S.

Death from Vaccination.—In Liverpool a death has followed as the result of vaccination. It appeared that the deceased had vaccinated himself from the arm of a friend, who was a chemist and druggist, and died about ten days afterwards of pyæmia. Medical evidence was given to the effect that the deceased was in a very unfit state for vaccination, as he was suffering from diabetes.

THE DIFFERENCE BETWEEN SPECIES AND RACE.

In the review of a work by M. Quatrefages, entitled, 'Charles Darwin et ses Précurseurs Français,' which recently appeared in the *Gardeners' Chronicle*, a *résumé* is given of the arguments of that celebrated naturalist, from which we abstract the following particulars.

As the result of an examination of the doctrine of Darwin, M. Quatrefages considers that it resolves itself into a simple and clear notion, which may be represented in the following formula:—All the actual and present animal and vegetable species descend by way of successive transformations from three or four original types, and probably from one solitary primitive archetype. Thus explained, he thinks Darwinism has in it nothing very new, and that the admirers of Darwin have not done justice to those who have preceded him in this path of speculation, such as De Maillet, Robinet, Buffon, Geoffroy and Isidore Saint-Hilaire, Bory de Saint Vincent, and M. Naudin.

The "general exposition of Darwinism" which follows is probably more in accord with the real views of Darwin, especially in reference to the doctrine of natural selection, than the writings of professed admirers and champions of the school.

M. Quatrefages is at issue with Mr. Darwin on the subject of the transmutation of species, whilst he believes in their variability. All Nature manifests correlation, and all the extinct species of animals range themselves side by side, or in the vicinity of species at present existing. To find place for all the fossil animals yet discovered, it has not been necessary to create one single additional class. The extinct and the living species appear as the integral parts of one system of creation. The embryonic structure of animals tends to the same conclusion. The second part of the book deals with the nature of the proofs invoked. The author finds that in all the writers quoted personal conviction takes the place of logical argument. Modern science requires more than this, and only accepts as proofs well-defined facts, and such as have been subjected to vigorous criticism. M. Quatrefages contends that the notions of Darwinism are opposed to the observed and ascertained laws of creation, and to the facts brought to our view by Paleontology, and says that Lamarck, in setting out from an assumption of spontaneous generation has, at all events, a logical basis on which to rest his theory; but Darwin, in refusing this doctrine, and in leaving out of sight the origin of his primordial being, is obliged to admit that some unknown cause has played the part of a creative power on this globe, and that only for once, during a limited time, and in only one manner. To produce for once an archetype, and to remain inoperative for ever after, is contrary to all human experience and belief.

M. Quatrefages afterwards enters upon the questions of species and races of hybridation and cross-breeding (*métissage*). He says the two first terms are often confounded. He quotes Isidore Saint-Hilaire, who, after a learned examination of the opinions of the most eminent botanists and geologists, says:—"Such is species and such is race, not only for the schools into which naturalists are divided, but for all. The gravity of their differences respecting the origin and the anterior phases of the existence of species does not hinder them from proceeding to the distinction and determination of species and race in the same way. So long as the question is only concerning the actual state of organized beings, all naturalists think the same, or at least act as if they thought the same."

M. Quatrefages thinks these words exactly define the question. "They teach us that schools exist only when we take a position outside of time and place accessible to observation, and that they are effaced as soon as we enter on reality. In the presence of what is, it is no longer possible to argue about what might be." Our author cites the definitions of between twenty and thirty leading naturalists, from the times of Ray to the present, and finds that "when they would define species they have all been constrained to include in their formulas the two ideas of resemblance and of descent." Vogt first comprehended in his definition of species the notion of the phenomenon of *généagenesis;* more recent works, and especially those of Darwin, have shown the great importance of *polymorphism.*

This is illustrated by the changes undergone in a cycle of generations of a *Medusa,* through the whole of which it remains fundamentally the same. Similar facts leading to the same result have been traced out in the vegetable kingdom.

"The species," then, according to M. Quatrefages, "is the collective amount of individuals more or less resembling each other, which are descended, or can be looked upon as descended, from one primitive pair by an uninterrupted and natural succession of families.

"The variety is an individual, or a collection of individuals, belonging to the same sexual generation, which is distinguished from other representatives of the same species by one or more exceptional characteristics.

"The race is the totality of individuals belonging to a single species having received, and transmitting by way of generation, the characters of a primitive variety.

"Thus the species is the point of departure. In the midst of the individuals which compose the species appears the variety, and when the characters of the variety become hereditary they form a race. These are the relations which for all naturalists reign between these three terms, and which it is necessary to have constantly before the mind in the study of the questions which occupy us."

Hence it follows that the notion of resemblance, which is very much attenuated in the species, becomes of absolute importance in the race.

The union of individuals of different species is very rarely productive. It is quite otherwise with the union of individuals of the same species but of different races.

M. Quatrefages considers both Lamarck and Darwin confound the ideas of species and of race. He says that Darwin, in order to sustain his theory, should have proved that crossing between races is not always possible; and that crossing between species can give rise to hybrid races. This he is so far from being able to do, that his works are a storehouse of observations tending to prove the direct contrary.

The power which man possesses of creating and modifying races both in the animal and vegetable world, is very great. Beginning with the egg, he can, by the simple application of heat in different ways, evolve abnormal productions, and by altering the surrounding circumstances of life, and by carefully crossing only with those possessing like peculiarities, he can produce races so unlike the species that they would certainly be set down, at first sight, as altogether different species. Thus, from one species of pigeon (as Mr. Darwin believes) he has succeeded in raising 150 races, but they are all, nevertheless, one species, and propagate freely among themselves. The dog, also, in like manner, has varied under his hand into 180 races, and it is familiar to every one how wonderful the triumph of human art has been in the vegetable kingdom. But man has never yet succeeded in producing one species, self-maintaining, capable of continued fertility within itself, and unfruitful in crossing with other species.

The advocates of Darwinism say that, if man can do so much, Nature, having all time at her disposal, can do much more, and M. Quatrefages admits that the argument is plausible, but denies its correctness. He shows that man can do many things which Nature cannot, and that in the natural state of things we do not find such phenomena as occur under the hand of man. In fact, if there is anything which must strike an observer in the organized world it is the order and the constancy which we see reigning for ages. The cause of all this is simple and unique. If the unions between wild species were in all senses and indefinitely fruitful, as they are among our doves and in our stables, what would happen? The barriers between species, between genera, would be taken away. Crossing would take place in all directions; everywhere would appear intermediate types, everywhere the actual distinctions would gradually become effaced and disappear. It is impossible to imagine where the confusion would stay its course. It would become a chaos of misformed creatures, such as the Babylonians dreamt of, and such as Lucretius described.

The same observations apply to past geological ages as well as to the present. All things being alike in other respects, fossil species are as well defined and as distinct as those of the present era.

Everything leads us to the conclusion that the laws of the organic world have not changed since the beginning. To admit the contrary is to oppose to all that we know concerning the present and the past of our globe, the possible, the unknown, or, in other words, hypothesis, having for its foundation our very ignorance.

On this account M. Quatrefages declines to believe in the origin of species by gradual transformation, and, in the name of science, feels compelled to combat Darwinism as much as the hypothesis of Lamarck.

GLYCYRRHIZIN.*

BY JOSEPH M. HIRSH.

The mode of preparing glycyrrhizin, mentioned in the last Dispensatory, of precipitating the same from a cold infusion, I found highly impracticable, on account of the slight solubility of the same in cold water. Berzelius's method of preparing it from sulphate of glycyrrhizin gave but a dark-coloured product, difficult to purify, while Vogel's method of preparing a plumbate of glycyrrhizin, and subsequent decomposition with hydric sulphuret, is rather laborious. The best practical process appeared to be the preparation from an infusion made with *boiling* water of acetate of glycyrrhizin, which upon evaporation to dryness is dissolved in alcohol, when the acetic acid is neutralized with soda, the new salt crystallizing out, while the glycyrrhizin remains in solution. Another method, giving good results, I found to be the preparation of an alcoholic extract by percolation, which I heated to the boiling-point, filtered off from the product produced, when I evaporated nearly to dryness, redissolved in alcohol, from which solution it remained behind almost pure upon evaporation.

Experimenting with this product in regard to its relation to masking bitterness, I found one part to cover up the bitter taste of four parts of Epsom salts, a slight addition of the latter being plainly perceptible, although by no means as disagreeable as when tasted alone. Of an alcoholic extract of coffee, an amount representing twenty parts of coffee, lost its bitter taste upon the addition of the glycyrrhizin. A number of other experiments of similar kind were made, but your reporter respectfully expresses his doubts about the *mathematical* reliability of results, arrived at by taste alone, and confines, therefore, his remarks to the *modus operandi* of the glycyrrhizin.

Taste being an effect upon the nerves of sensation (of taste), the change of taste can be produced either by a chemical change of a substance, or by a peculiar local affection of the nerves of taste. The first case, as might have been anticipated, with Epsom salts, does not occur, the glycyrrhizin not affecting the sulphate of magnesia in any way.

The second supposition then lay near, namely, that the nerves were rendered insensible to the bitter taste. This might be done by an organic change of nerve matter, or by the interposition of a foreign body between the nerves and the bitter substance. To ascertain the former lay beyond the facility of your reporter, and I made, therefore, the best of the last supposition, which seems to give a true solution of the problem. When glycyrrhizin or liquorice dissolves upon the tongue, the latter soon becomes furred, coated, this coat being a coagulum of the albumen of the saliva with the glycyrrhizin. A few tests convinced me that even a weak solution of albumen coagulates readily with glycyrrhizin, and I took the artificial coating of the nerves produced by the albuminous coagulum of glycyrrhizin to be the true cause of its masking bitterness. If this was true, other substances, which readily coagulate albumen, should produce the same result.

With this idea I tried a solution of carbolic acid with various bitter substances, and in each case the bitterness was annihilated if the quantity of carbolic solution was sufficient. But while glycyrrhizin and its compounds are sweet, this is not the case with carbolic acid, the taste of which replaced that of the bitter substance with which it was mixed, this taste being in itself not agreeable. To remedy this evil, carbolate of glycerin was tried with marked success. Epsom salts, coffee, absinthe, etc., lost their bitter taste when mixed with a sufficiency of carbolic glycerin.—*Proc. Amer. Pharm. Assoc.*, 1870.

* Paper read at the Meeting of the American Pharmaceutical Association in answer to the query, "What is the easiest and most practicable method of isolating glycyrrhizin; to what extent does it possess the power of masking bitterness; and what is its mode of action?"

NEW METHOD OF DISTINGUISHING VEGETABLE FIBRES.

Dr. Isidor Walz gives, in the *Manufacturer's Review*, a summary of M. Vetillard's method of distinguishing the fibres of linen, hemp, cotton, jute, China grass, New Zealand flax, which is of such easy execution that we print the whole of it.

If a woven or spun fibre is to be examined, it must first be disintegrated into the single fibres, and any colour or finish must be removed as completely as possible. Vertical and longitudinal microscopic sections are next made. These are rendered transparent by glycerine or chloride of calcium, and treated with tincture of iodine, made by simply dissolving iodine in a solution of iodide of potassium. The excess of this tincture is removed, a drop of dilute sulphuric acid added, and the sections examined by the aid of the microscope.

Linen Fibre.—Bundles of smaller fibres, with a fine canal in the centre, long, uniformly thick, and pointed at the ends. Longitudinal section: the fibres are coloured blue, the canal yellow. Cross section: regular polygons, loosely connected, coloured blue; centres yellow.

Hemp.—Fibres aggravated; each fibre covered with a thin skin, coloured yellow. They are thick and less uniform than the linen fibres. The ends are thick, and of the shape of spatulas, and become blue or greenish-blue with iodine. Cross section: irregular polygons, firmly connected; rim yellow, the mass blue, the centre colourless.

Cotton.—Longitudinal section: single fibres, spirally wound on their own axis, with a central canal and broad ends; coloured blue by iodine. The cross sections are rounded in the shape of kidneys and coloured blue, with yellow spots interspersed.

China Grass.—Longitudinal section: fibres separated lengthwise, of varying thickness. The interior canal is often filled with a yellow granular substance, which is coloured brown by iodine. The fibre is turned blue by iodine. Cross section: irregular, with re-entrant angles, and little cohesion. The fibres are stouter than all other fibres, and are turned blue by iodine.

Jute.—Fibres strongly coherent, the ends undulating, and difficult to separate. Central canal wide, empty, and gently rounded at the ends; coloured yellow. Cross section: polygons strongly coherent and regular, much like those of hemp, but the central opening is larger; coloured yellow, darker at the rim.

New Zealand Flax.—Bundles of cells of the leaves, easily separated with a needle into stiff little fibres, provided with a canal of uniform width. The sides are rolled inwards; coloured yellow. The cross section resembles that of jute, but the corners of the polygons are rounded off. They are coloured yellow by iodine tincture.—*Journal of Applied Chemistry.*

MEETING IN NEWCASTLE-ON-TYNE.

A Meeting of chemists and druggists was held in the lecture-room of the College of Medicine, Newcastle, on March 13th, to consider the poison regulations as proposed by the Council of the Pharmaceutical Society, and other business. Mr. J. W. Swan, having been called to the chair, opened the proceedings by saying it would be desirable to discuss, in a conversational manner, the merits of the proposed regulations before passing any formal resolution upon the subject. He remarked that if the regulations were adopted, and we were to practise a minimum of what would then be required, the requirement would be that all vessels containing poison should be distinguished in some exceedingly slight manner from those which contained non-poisonous substances. One great objection to a compulsory measure was, that the enforced precaution to be general must of necessity be slight, probably much less stringent than the precautionary measures which would otherwise have been voluntarily adopted. As to special forms of poison bottles, as a particular pattern was not, and cannot be, universally adopted, the connection between a particular form of bottle and its contents, being invariably of a poisonous nature, could not by any possibility take hold of the public mind. Such bottles would, by the public, be put to all the natural uses of bottles in general, and at last be used quite indiscriminately. It appeared to him they had two or three courses to pursue in the matter. One was not to do anything at all; another was to support the Council in carrying out these compulsory regulations. Another course was to recommend some modification of the regulations; but if they wished to be left to themselves in the management of poisons, to use their own judgment, then the obvious course for them to pursue was to oppose the new regulations.

Mr. Brady explained the present position of the question as between the Privy Council, the Council of the Society and the members; and reviewed some of the reasons which might be given against the enactment of the regulations brought forward by the Council, condemning any increase to the present compulsory code as probably entirely unnecessary and certainly premature.

Mr. R. H. Brockett supported the remarks of the previous speakers; and after some further observations from the meeting, which expressed itself as being strongly opposed to the regulations, he moved the following resolution, which was seconded by Mr. Glover and carried unanimously:—

"Considering the great diversity of arrangements necessary in different pharmaceutical establishments, this meeting thinks it impracticable to draw up any code of regulations for the keeping of poisons which it would be desirable to enforce alike in all."

The Chairman said he did not see the necessity for compulsory regulations, for practically no serious danger to the public at present existed.

Various gentlemen present having expressed their conviction that the number of cases of poisoning which were sought to be prevented by the proposed regulations was very small, and likely to become gradually less under the operation of the Pharmacy Act, and that any compulsory derangement of existing precautions would result in a present, if not a permanent, increase of danger. Mr. R. Elliott moved—

"That it is not desirable to attempt any additions to the compulsory regulations for the keeping and selling of poisons already contained in the Pharmacy Act, till experience has shown that the latter do not afford all reasonable protection against errors on the part of pharmacists."

The resolution, having been seconded by Mr. Wilkinson, was carried unanimously.

Mr. B. S. Proctor said that remarks having fallen from Mr. Brady and other gentlemen that it might be desirable for the Council to submit a code of regulations which they could recommend for voluntary adoption wherever practicable, he would suggest that the addition of a label stating the dose was the most desirable addition to the name of the article, as a means of promoting an intelligent caution in the handling of dangerous drugs. He said he had taken so prominent a part in the discussion of the question in the Journal, that he would not now move any resolution upon the subject; his desire being rather to elicit the expression of opinion from others than to advocate his own. He had already advocated this proposition, and now would only add that he considered it eminently useful, practical and simple, and calculated to encourage a thoughtful attention to the labels; in this respect contrasting with many distinctive marks or stoppers which had been proposed, which he thought likely to encourage the habit of knowing the bottle by its stopper or its general appearance, thus withdrawing part of the attention which should be concentrated upon the label. If the meeting agreed with him in this respect, he would be glad to see a resolution proposed embodying the suggestion.

A general conversation ensued, after which it was moved by Mr. T. E. Watson, seconded by Mr. J. C. Ritson, and carried unanimously,—

"That the following be suggested to the Council of the Pharmaceutical Society as a suitable basis for regulations to be recommended for voluntary adoption:—

"*In the keeping of Poisons.*

"1. That all poisons should be labelled with their name.

"2. That poisons which are used internally should also bear a label stating their usual adult dose.

"3. That poisons which are not used internally should bear a label with the words 'not for internal use.'

"*In the sale of Poisons.*

"4. That the above regulations should be observed in cases of ordinary sale, though not necessarily in dispensing."

Mr. Greenwell, M.P.S., moved and Mr. Alfred Brady, M.P.S., seconded the following resolution—

"That in the opinion of this meeting reporters should be admitted to the meetings of the Council of the Pharmaceutical Society, with the view of affording to the members of the Society fuller information respecting the management of its affairs."

The Chairman remarked that though the whole body of chemists and druggists, now being in some measure under the control of the Pharmaceutical Society, had a right to criticize its management, he was glad to see that this resolution was moved and seconded by members of the Society.

The Chairman said a meeting which had been so unanimous in its resolutions could not close more appropriately than by all the gentlemen present contributing to defray the expenses incurred by those who had taken the trouble of drawing attention to the important question they had just been discussing.

In response to this invitation fourteen gentlemen subscribed to the defence fund and towards the expenses of the meeting.

On the motion of Mr. Glover, a vote of thanks to the Chairman was carried by acclamation.

The Pharmaceutical Journal.

SATURDAY, MARCH 18, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

BUSINESS.

BUSINESS has been defined as "the art of transferring money from other people's pockets to one's own," and in these days of "free" trade there is much reason for regarding the definition as very generally apt and truthful; but it is at the same time obvious that the principle it involves necessitates some limitation in the exercise of the art. Without attempting to define precisely the limits of legitimacy, it is easy to perceive in certain forms of business various degrees of shadiness that show they are very near those limits, if they are not outside them.

We have been led to these remarks by two circumstances that have quite recently come under our notice. The first is a very singular advertisement appearing in some of the daily papers headed "extraction of silver from sea-water," and announcing that the advertiser requires twenty subscribers of £10 each, to enable him to carry out his invention for that purpose. In return he proposes to give each subscriber "a free licence to use his patent for forty years or life," and for an additional £25 to provide him with an instrument "of limited dimensions," to which silver is to adhere on passing it through the sea-water. It is added that an ordinary seaman can work the apparatus without being able in any way to deceive the proprietor, also that "not more than one subscription will be given to one person, and not more than twenty will be taken."

We are unable to say what has been the result of this remarkable "silver-extracting enterprise," and therefore we can only leave our readers to speculate on this point as they may feel inclined.

The other illustration of modern business to which we have referred, is afforded by our contemporary the *Chemist and Druggist*. It will be remembered that in January last an editorial article appeared in that journal on the vexed subject of poison regulations, which we do not hesitate to say excited considerable astonishment, and in certain quarters the most poignant horror. For our own part we must confess to having been amazed to see our contemporary assuring its esteemed friends that although feeling its position acutely there was no help for it—that although believing from its antecedents that its place is most properly in opposition, and while trying always to be on the right side, it could, in the matter of Poison Regulations, only advocate the same views as those enunciated by the majority of the Council, and denounce the opposition to them as weak, the sentiment on which it was based as an error, the objections as illogical, irrelevant or absurd.

We have never yet been able to decide, in our own mind, how far Christmas festivities were to be held responsible for that article; but in any case the succeeding number bore evidence that he had seen the error of his way—the process of conversion had evidently set in, and awakening penitence was indicated by an article ridiculing the circular issued by the Council of the Pharmaceutical Society. This month, to judge from the symptoms manifested, we may assume that a "state of grace" has been attained, and we cannot illustrate this better than by the following juxtaposition of an extract from the article of January with one from a circular just issued by our contemporary:—

January 14th.	*March.*
"To state the case thus—and we have endeavoured to state it fairly—seems to us sufficient to prove the weakness of the opposition. The sentiment on which the resistance is based, which is a conception that the Council is arrogating to itself tyrannical powers, is simply an error. The Council suggest these regulations, and asks the trade—shall they be enacted or not? Granting that, neither the second, third, nor fourth objection which we have mentioned is logical; that the best druggists already adopt some such plan, surely argues its wisdom; whether the risk of accidental poisoning by the druggists would be diminished *at all* is the point, not whether it would be removed altogether; and the final argument that doctors would not be subject to these regulations, is unanswerable, purely for the reason that it is quite beside the question."	"We say that the Council of the Pharmaceutical Society, by its action in this matter, has shown itself unworthy to occupy the position which has been delegated to it, because unable to appreciate the broad view of the responsibilities and duties which now belong to that position, and which could not be attached to it when the Council was merely the governing body of a private society."

But it will be asked, what has this to do with the subject of this article? To answer this question, we must refer to another document issued by our contemporary, together with the circular above mentioned,—not generally, however, but only to a select portion of the trade,—the non-subscribers to the *Chemist and Druggist*. In this supplementary manifesto the virtues of our contemporary are modestly narrated, and a cordial invitation given to come within the fold.

Light now falls on the affair. Since January, our contemporary had not only been converted, but, looking down from a dangerous eminence,—like that whence Count BISMARCK was lately represented as pointing to kingdoms and principalities,—had perceived that among the thirteen thousand registered Chemists and Druggists of Great Britain, there was outside the circle of its subscribers a margin in which a stroke of business might, perhaps, be done by means of the poison regulations.

The whole transaction may be depicted by a slightly-altered rendering of a verse from a familiar pre-TUPPERIAN source of infantile morals :—

How doth the little *C. and D.*
On poisons seek for voters;
And scatter stamps through all the trade,
In hopes of further orders!

THE ONTARIO PHARMACY BILL.

ON Monday, February 6, the Bill for regulating the practice of Pharmacy in the province of Ontario was read a third time in the Legislative Assembly and passed. According to our latest advices, it was only awaiting the signature of the Lieutenant-Governor to become law.

The Bill met with considerable opposition during its passage through Committee, and clause 4 was struck out; but it was restored in the full house, after the Committee had made their report.

The following is a *résumé* of the Bill :—

Clause 1 declares that after the 1st July, 1871, it shall be unlawful for any person to keep open shop for compounding medicines or retailing poisons, or selling any of the articles named in a schedule attached to the Act; or to assume the title "chemist and druggist," "druggist," "pharmacist," "apothecary," "dispensing chemist or druggist," unless such person be registered under the Act or has taken out a certificate under the 21st section, which provides that parties registered shall receive a certificate stating the time during which they may carry on business. This term extends from year to year, and the certificate must be procured annually from the Registrar.

The second and third clauses have reference to the articles which are to be deemed poisons within the meaning of the Act. We intend to give these particulars next week.

The fourth clause relates to the formation of the Ontario College of Pharmacy. Persons engaged in business, as principals or assistants, at the time of the passing of the Act, or who have carried on the business for three years, or who have served an apprenticeship of three years and acted as assistants one year, are, upon payment of a fee of four dollars, to be enrolled as members. Clerks, assistants and apprentices lacking the above qualifications, or not wishing to become full members, may upon the payment of a fee of two dollars be enrolled as associates. An associate may subsequently become a member by passing such examination as may be prescribed by the Council.

The sixth clause constitutes the College of Pharmacy a body politic and corporate. A provisional Council and Registrar are appointed to hold office until the first election in October, who have the power to grant certificates of competency to conduct the business of a chemist and druggist, and to be registered under the Act. The election of the first Council is to take place in October next, and the persons qualified to vote at that election are those who at the time of the passing of the Act were actually engaged in business. Subsequent elections are to take place in July of each year, and the persons qualified to vote at such elections are to be the members of the College.

The Council are to hold two sittings every year for the purpose of granting certificates of competency. Persons desirous of being examined have to give notice to the Registrar, and pay a fee of four dollars. Persons passing the examination satisfactorily to the majority of the examiners are to be entered upon the roll of Registered Chemists and Druggists, and become members of the College. The examination may be conducted by the Council or by examiners appointed by them. The Council have the power to prescribe the subjects upon which candidates are to be examined.

The fifteenth clause directs that the Registrar is to keep a correct list of persons registered under the Act, and publish annually a list of persons qualified to keep open shop as pharmaceutical chemists.

The seventeenth defines the qualifications which are to entitle a person to be registered as a pharmaceutical chemist. These are identical with those necessary for membership, and an annual subscription of four dollars. Non-payment of the subscription is followed by the withdrawal of all privileges.

According to clause 20, the title of "Pharmaceutical Chemist" may not be assumed by any other than those registered under the Act, and none but such persons or their servants are authorized to dispense the prescriptions of medical practitioners. The certificates of qualification are to be displayed conspicuously in the places of business.

The rights and privileges at present enjoyed by physicians and surgeons are reserved by the Act, and it provides that any physician or surgeon may be registered as a Pharmaceutical Chemist without undergoing any examination.

ACCORDING to the financial statement made to the Indian Legislative Council at Calcutta last week by Sir RICHARD TEMPLE, the revenue to be derived from opium in the ensuing year is estimated at £8,000,000.

THE Medical Act (1858) Amendment Bill, No. 1, brought in by Dr. LUSH, and No. 2, brought in by Dr. BRADY, have been read a first time in the House of Commons. Their second reading is set down for June 14.

Transactions of the Pharmaceutical Society.

BOTANICAL PRIZE FOR 1872.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1871, and the first day of June, 1872; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Honour and Merit, will be given at the discretion of the Council. In the event of none of the collections possessing such an amount of merit as to warrant the Council in awarding Medals or Certificates, none will be given.

The collections to consist of Flowering plants and Ferns, arranged according to the Natural System of De Candolle, or any other natural method in common use, and to be accompanied by lists, arranged according to the same method, with the species numbered.

The collector to follow some work on British Botany (such as that of Babington, Hooker, or Bentham), and to state the work which he adopts. The name of each plant, its habitat, and the date of collection, to be stated on the paper on which it is preserved.

Each collection to be accompanied by a note, containing a declaration, signed by the collector, and certified by his employer, or a Pharmaceutical Chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1871, and the first day of June, 1872, and were named and arranged without any assistance but that derived from books.

In estimating the merits of the collections, not only will the number of species be taken into account, but also their rarity or otherwise, and the manner in which they are preserved; and should a specimen be wrongly named, it will be erased from the list.

The collections to be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1872, indorsed "Herbarium for Competition for the Botanical Prizes." After the announcement of the award, they will be retained one month, under the care of the Curator of the Museum, for the inspection of persons connected with the Society, and then returned to the collectors, if required.

No candidate will be allowed to compete, unless he be an Associate, Registered Apprentice, or a Student of the Society, or if his age exceed twenty-one years.

FREE ADMISSIONS TO THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

The following pupils of the class of Botany and Materia Medica, in the Pharmaceutical Society, after examination by Professor Bentley, have had free admission given to them, at his request, by the Secretary of the Royal Botanic Society:—

Mr. Chas. Alexander Blake.	Mr. F. W. Kendle.
,, Wm. Milner Burgess.	,, W. T. Maddock.
,, Henry Churchill.	,, Charles A. Overton.
,, Walter Cole.	,, Charles Pretty.
,, Herbert E. Constance.	,, Harry Savory.
,, Horace Davenport.	,, Charles T. Ward.
,, Chas. Joseph Holmes.	,, Herbert Charles Webb.
,, N. W. Holmes.	,, Wm. Henry White.
,, G. B. Howarth	,, Alexander Wood.
,, Thomas Iredale.	,, Harold Woolley.

The above names are arranged in alphabetical order.

These orders will admit to the Gardens upon ordinary days in the months of March, April, August and September, from 9 A.M. till 1 P.M.; and in May, June and July, from 7 A.M. till 1 P.M. Such admissions, therefore, give every facility to those who possess them of making themselves practically acquainted with plants.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Fifth General Meeting of the Society was held at Britannia Chambers, on Friday evening, 24th ult.; the President, Mr. ATHERTON, in the chair.

The meeting was well attended by the members and Associates.

The minutes of the previous meeting were read and confirmed.

The SECRETARY announced that the PHARMACEUTICAL JOURNAL had been received regularly during the month, as also a number of old works on pharmacy and allied subjects, from Dr. Wright, and, through the kindness of T. Hydo Hills, Esq., portraits respectively of the late Dr. Pereira, Mr. Jacob Bell and Mr. W. Allen. A cordial vote of thanks was accorded to the several donors. A variety of interesting objects were exhibited and explained; conspicuous amongst which was Siebold's collection of dried plants.

The PRESIDENT then called upon Mr. Elder, M.B., for his promised paper on "Our Foods."

Mr. ELDER responded, and explained in a very lucid manner the physiological action of our foods, commencing with the action of the salivary glands and the nature of the changes which take place in the mouth with the consequent production of ptialine; he next proceeded to divide the foods into four classes,—albuminous, oleaginous, saccharine and mineral,—following with the composition of each class, their respective utility and the amount of carbon and nitrogen by which their value as heat or flesh-producers is estimated; the importance of the mineral constituents for the proper formation of blood, and the effect produced upon the blood when not taken in proper quantities.

A vote of thanks to Mr. Elder for his interesting paper was unanimously carried.

Mr. W. H. PARKER brought forward the objects of the Defence Association just established in Manchester, and expressed his approval of their proceedings.

Mr. ATHERTON also was in favour of the defence, considering as he did that the regulations about to be brought forward in May are objectionable; that pharmacists already do their best for the public safety, and, therefore, he thought compulsory measures quite unnecessary, as by that means the liberty of the subject would be interfered with, and the status of the chemist detracted from or lowered thereby. Admitting that accidents had happened, he was convinced that the frequency had been much diminished since the improvement in the education of the chemist. He also mentioned the fact that in Glasgow and many other Scotch towns, the number of open surgeries and chemists' establishments was about equal; the former would be exempt from the regulations, and he wished to know if the proprietors of these surgeries were better acquainted with the art of pharmacy than ourselves, and, if not, why the exemption? He considered this fact a weak point in the regulations, but a strong one for the defence.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eighth General Meeting was held at the Royal Institution, on Thursday evening, the 2nd instant; EDWARD DAVIES, Esq., F.C.S. (Vice-President), in the chair.

Mr. Alfred Coughtrey was elected a member.

A short discussion took place upon the "Proposed Poison Regulations," and it was moved by Mr. REDFORD, and seconded by Mr. SHAW, "That the Secretary be instructed to call a meeting of the chemists and druggists of Liverpool, to consider the proposed compulsory regulations for the keeping, storing and dispensing of poisons."

The paper for the evening was read by Mr. W. Keith, upon "Permanent Photographic Printing."

After describing the autotype, Woodbury-type and heliotype processes, Mr. Keith showed practically the development of the picture in the carbon process by the use of hot water only. The paper was illustrated by specimens of various processes, as well as the instruments used. He drew particular attention to the heliotype process of Messrs. Edwards and Kidd as being the latest, and supplying a want long felt of a means of applying photography to book illustration, the pictures which he exhibited having been printed in printing-ink at an ordinary press, with a margin so as to obviate the necessity of mounting, and ready to bind up with printed matter.

A discussion followed, in which the Chairman, Messrs. Hallawell, Houghton and Bird took part; and, upon the motion of the Chairman, seconded by Mr. Redford, an unanimous vote of thanks was passed to Mr. Keith for his very interesting and instructive paper.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Monthly Meeting was held on Tuesday, March 7th; Mr. H. Thompson in the chair.

Mr. Sharpe introduced a motion on prices. He compared the chemists of the present day unfavourably with those of older times in the profits they obtained on their articles, and moved that a committee be formed to draw out a list of prices on the basis of that so successfully carried out in Edinburgh and other places.

Mr. Sidgwick referred to the cost of education and apprenticeship, and drew attention to the manner in which dispensary prescriptions were carried about the town until some chemist was found who would dispense them for less money than the others.

Mr. J. Harrison admitted that Mr. Sharpe had shown that an evil does exist, but contended that he had not suggested an effectual remedy; that the Society had neither the right nor the power to impose conditions on those who were outside its pale, and that it was useless attempting to enforce uniformity in practice until there was unity in principle.

Mr. Robinson thought Mr. Sharpe's plan quite practicable, if there were as much good feeling among the chemists and druggists as among the solicitors, who, by the moral power of their Law Society, were able to prevent any individual member from injuring the others by undercharging.

Mr. Nicholson agreed with Mr. Sharp's proposal in principle, but was doubtful as to their power to carry it out in a town like Sunderland, where the dispensing and higher branches of a chemist's business formed so small, and the mixed retail so large a proportion of their returns. The success of a plan in Edinburgh was no evidence that it was adapted to Sunderland, where the conditions were so essentially different.

Mr. Sharp replied, and proposed that a Committee be appointed to adopt some feasible arrangement on the subject, which proposition was carried by a large majority.

Mr. Harrison gave notice that, at the Annual Meeting, in April, he would propose:—(1.) That the ordinary meetings of this Society be held on Tuesday evenings instead of Mondays. (2.) That a petition be forwarded to the Annual Meeting of the Pharmaceutical Society on the subject of the Juries Act. (3.) That a petition be also forwarded against the poisons regulations.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The usual Monthly Lecture in connection with this Association was delivered at the Music Hall, on Wednesday evening last, by H. C. Sorby, Esq., F.R.S.—subject, "Blow-pipe Chemistry." Mr. G. B. Cocking, Vice-President, occupied the chair. Mr. Sowerby commenced his lecture by explaining the methods adopted to obtain blow-pipe beads enclosing various crystals, which, independent of their connection with chemistry and mineralogy, were of extreme beauty merely as microscopical objects. His own method differed materially from those described by Emerson, Rose, Ross, and other authors, he using borax as the solvent, and, if requisite, adding various reagents, so as to produce, as it were, precipitates of characteristic crystalline form. By this means transparent, glass-like beads were obtained, containing perfect crystals of the substances added. The beautiful forms in which the following and other chemical substances crystallized were described, viz. borate of magnesia, first as thin prisms, then, by the deposit of smaller crystals, giving rise to objects very much like a handle with a brush at each end; borate of zirconia, as small prisms with a simple cross at each end afterwards becoming more complicated; molybdate of zirconia, which are so delicate that their own weight would probably break them, if in an aqueous solution, but being supported in solid borax, like insects enclosed in amber, they are secure from all injury, and become extremely elegant and beautiful objects; tungstate of lime, molybdate of strontia, phosphate of lime or soda, titanic, columbic, and molybdic acids, etc. The method of preparing and mounting these objects for permanent use was explained; this being to enclose them in a cell with Canada balsam, by which means the moisture of the atmosphere which causes the borax to become hydrated and opaque was excluded, the alteration then taking place so slowly that the lecturer had not remarked any change after a period of six months. The full beauty of these specimens can only be seen with a binocular microscope; and few objects are better fitted to show the advantage of that kind of instrument, for the crystals then stand out in perfect relief, and are seen to be equally complicated in all directions, though not in each case alike, as those formed on the surface of the bead differ very materially from those in the interior, and in both positions, though the type is constant, the forms vary very considerably. As illustrating the scientific value of microscopic blow-pipe chemistry, Mr. Sorby related the following fact:—Mr. Maskelyne, of the British Museum, had obtained from a new rare mineral in a meteorite a very small quantity of a substance which much resembled the earth zirconia. If it had been so, the fact would have been very interesting, since hitherto there has been no evidence of the occurrence of that substance beyond our own globe. The amount of material was, however, too small to enable Mr. Maskelyne to decide the question by the usual methods of chemistry; he therefore placed about one-half of the entire quantity in the hands of Mr. Sorby, and, though this was no more than 1-100th of a grain, he succeeded in proving that it was titanic acid, a substance which had previously been detected in meteorites and not zirconia.

GLASGOW CHEMISTS' AND DRUGGISTS' ASSOCIATION.

The Eleventh Meeting of the Session was held in Anderson's University, 204, George Street, on the 8th instant; Mr. T. Davison, President, presiding.

Messrs. A. Jamieson and Robert Walker were elected members.

After the regular preliminary business, Mr. Clark, who was introduced by the Chairman, delivered a paper on "Botanizing, or some hints in the Collecting of Botanical Specimens."

Mr. Clark said he found his subject was naturally divided into two parts, namely, "Collecting" and "Drying," and as his remarks on the former required the full time allowed for the reading of his paper, he would reserve the latter part till some future night. He then described the first steps the botanist required to take in beginning the collection of plants, and explained the use of the necessary apparatus, viz. the digger, vasculum, and pocket-glass, and after mentioning the proper time for collecting plants in fit condition for the botanist's purpose, and giving some hints on the selection of plants for beginners, he described the different parts of a flower as calyx, corolla, stamens, and pistil; and in referring to the fruit, begged to explain what was a popular error, viz., that the soft part of such fruits as the strawberry, apple, orange, etc., was not in reality fruit, but merely a soft covering or protector of the fruit proper. He then referred to the uses of botany in the arts and medicine, and made particular reference to the value of a thorough understanding of its principles to the chemist, and that these principles could only be well grounded in the earlier years of one's apprenticeship; he also referred to the selecting of poisonous from non-poisonous plants, showing how a traveller who had a knowledge of botany could not be at a loss for food, in an emergency. He then drew attention to the specific and generic names of plants, recommending the 'Clydesdale Flora,' by Professor Hennedy, as the best text-book for this district, and mentioning some spots in the neighbourhood well adapted for the study of the science. Mr. Clark's paper was listened to with marked attention, and was rendered all the more interesting by being illustrated with diagrams and natural flowers.

The Report of the Soirée Committee was then brought forward by the Secretary, showing a balance of cash of £1. 6*s*. 6*d*., and, on the motion of the President, this sum was ordered to be added to the funds of the Association.

Mr. Paterson, in proposing a vote of thanks to the Committee, referred to the promise made by Mr. Macdonald to give a donation of other £5 to the Society, and also read a communication he had had from Messrs. Evans, Sons, and Co., Liverpool, authorizing him to present to the Association one of their five guinea cabinets of Materia Medica.

On the motion of the President, seconded by Mr. Paterson, the Secretary was instructed to convey to these gentlemen the best thanks of the Association for their handsome donations, which was agreed to by acclamation.

An address by Dr. Black was announced for next meeting.

HALIFAX CHEMISTS AND DRUGGISTS' ASSOCIATION.

Mr. Stott, President, in the chair.

The business of the meeting commenced with the presentation of prizes to the successful students in the botany class. All the pupils being present, Mr. Stott addressed them, saying it had fallen to his lot to present these first prizes of the Association, and the pleasure he had in doing so, though great, would have been far greater if he could have congratulated them on the result of the examination. He found, however, that the most successful had reached little more than half the number of marks attainable. He pointed out the importance of these local classes, and thought they would become more numerous, as the number of young men who presented themselves at Bloomsbury Square for the purpose of study kept steadily increasing. He bade the students go on in their career, and take advantage of every opportunity to increase their store of knowledge, till they were able and competent to fulfil the duties of their future calling.

Mr. Shaw thought the President had been rather too hard upon the class. Having gone over the same ground as the students, he could make great allowance for their comparatively slight success. Botany was not such an interesting science as some others, and, unless there was a special liking, and an intuitive reception of its laws and principles, he could quite understand it might prove a little dry and tedious at the commencement. The neighbourhood, too, was not the best for botanizing. Some twenty miles off was a better ground, where they might collect many specimens, and, with Bentham for reference, would find employment for many evenings of study. He pointed out to them the scholarships in connection with Bloomsbury Square, and hoped the seeds now being sown would in time bear fruit.

After a few words from Mr. Farr,

Mr. Hebden stated that it was the intention of the Association to commence a class for materia medica, and that an examination would be held, and prizes offered, as well as in Latin and chemistry.

The President then drew the attention of the meeting to the proposed regulations of the Council with respect to poisons, and whilst for his own part he could not support them, he should be glad to hear the views of the members generally.

Mr. Dyer, believing there was no halfway of meeting the Council on this question, had come to the conclusion that they should be opposed, and was glad that Manchester had moved in the matter, and the Defence Committee, he thought, should be supported. He could not but feel it to be an insult, and degrading to a chemist, to have these regulations forced upon him, and his shop to be inspected by a surgeon.

Mr. Shaw could not support them. From the tone of the medical journals, he thought he could perceive a strong *animus* against our body at large, and an evident desire to fetter us with restrictions, whilst their own surgeries should be exempt. The Privy Council, in conjunction with the Pharmaceutical Council, having the power of increasing the schedule of poisons, might prove a serious source of annoyance under the proposed regulations. From the ignorance displayed by those in authority with respect to the poison schedules in the Act of 1868, he dreaded being placed any further under their jurisdiction.

Mr. Hebden would have been glad if the members would have approached this question with an earnest desire to improve the regulations, rather than throwing them overboard altogether. A mild inspection, in his idea, was not so frightful as had been stated. He thought, in the long-run, it would even prove beneficial in many respects. He felt sure, if rejected, stronger and firmer ones would be brought forward, perhaps in the midst of a panic on the part of the public, when reason would be lost sight of, and we should be compelled to accept such as the Privy Council demanded.

After a few words from Mr. Farr against the proposition, and Mr. Wood supporting the views of Mr. Hebden,

Mr. Brook agreed with Mr. Shaw, that the Medical Council had a great deal to do with it; in fact, he looked upon it as an attempt on the part of that body to create a vast monopoly of their interests. Inspection by surgeons first, then they would try to put down counter-prescribing. See what a power for annoyance would be created and placed in their hands by inspection, and couple that with the 26th clause of the Act of 1868. He advocated a strenuous opposition to the regulations.

Mr. J. B. Brierly and Mr. Jessop strongly condemned them as insulting and degrading.

The following resolution was carried unanimously:—

"That, in the opinion of this meeting, the proposition of the Council for compulsory regulations in the dispensing and storage of poisons is uncalled for by the public, inimical to the true interests of the trade, and ought to be most strenuously opposed and resisted."

Proceedings of Scientific Societies.

LONDON CHEMISTS' ASSOCIATION.

At the Meeting on Thursday, February 23rd, 1871; Mr. Peal in the chair,

Mr. De Putron read a paper on "Filtration." Commencing with the important filtration of water, he described several modes and mediums. He considered animal charcoal to be the best and cheapest of all for household purposes, but it was not a sufficient purifier for medical or chemical use, as it did not entirely remove lead and lime. Silicated carbon was a valuable improvement. Speaking of the indispensable paper filter, he said care should be taken to fold it with a sharp end, as the flow of liquid from an acute point was much more rapid than from an obtuse angle. Bibulous paper first became charged with the fluid, it was then forced through by the pressure of the remainder, therefore as the capillary passages are more open when the paper is dry, the first of the liquid passes through quickly, but was not so bright as when the pores of the paper had closed, so it should be refiltered. To keep a continual flow, and to prevent the paper giving way, a good plan was to throw in some small pieces of blotting-paper, tow, or any similar light substance, so as to separate the viscid sediment; the funnel should be kept quite full. If percolators were properly packed, it was not necessary to filter the tinctures.

He noticed an excellent filter funnel made by Messrs. Bailey, of Salford, which was so constructed that the liquid passed through a layer of sand at the top of the neck; also one invented by Mr. Schacht, upon the principle of causing a vacuum, and employing the consequent pressure of atmosphere for forcing the liquid through the filtering medium. After describing the best methods of filtering and clarifying several pharmaceutical preparations, he concluded with that of oils.

MEETINGS FOR THE ENSUING WEEK.

Monday ......*Medical Society*, at 8 p.m.
London Institution, at 4 p.m.—"On Astronomy." By Mr. R. Proctor.

Tuesday ......*Royal Institution*, at 3 p.m.—"The Nutrition of Animals." By Professor Foster.

Wednesday... *Society of Arts*, at 8 p.m.—"Drill, the Complement of the present School Teaching." By Major-General Eardley Wilmot.

Thursday ......*Royal Society*, at 8.30 p.m.
Royal Institution, at 3 p.m.—"Davy's Discoveries in Chemistry." By Prof. Odling.
London Chemists' Association, at 9.30.—"Phosphoric Acid." By Mr. G. Brownen.

Friday ....*Royal Institution*, at 9 p.m.—"The Eclipse." By Mr. Lockyer.
Quekett Club, at 8 p.m.

Saturday ...*Royal Botanic Society*, at 3.45 p.m.

Parliamentary and Law Proceedings.

Charge of Poisoning.

At the Leicester Police Court, on Thursday, March 9, a case of poisoning of a very unusual character was investigated. Two young Jews, named Heyman Balsam and Simon Ettel, were charged with having, on the 18th of February, administered poison to three young girls, named Amelia Westbury, Mary Jane Faulkes and Sarah Bale. According to the evidence it appeared that the prisoners and the girls worked together for a tailor. On the 18th of February the prisoners, who were about to leave their employer, asked all the girls working in the room to go to a public-house and have some ale at their expense. The girls, to the number of fourteen, went with the prisoners. They had one gallon of ale, and when that was drunk Balsam called for another half gallon and a clean glass. These having been brought, the prisoners turned their backs to the girls for a short time, Ettel holding the glass. When they turned round again, Balsam filled the glass with ale, and handed it to the girl Westbury, saying, "Drink our healths, and you'll remember us leaving you as long as you live." She drank, and was setting the glass down when Balsam told her to pass it on. Both the other girls then drank, and they all three immediately became very ill. Medical assistance was obtained and an emetic given, and they were afterwards conveyed to the infirmary. A portion of the vomit was sent to Professor Attfield for analysis.

Professor Attfield said that he had received a six-ounce bottle, sealed and tied down. He examined the contents of the bottle, according to his instructions, for opium and nux vomica. He found no opium, and but a slight trace of strychnine. He examined the remainder for cantharides, but found none. He afterwards received another bottle, with instructions to search for aconite, which he did, and found distinct evidence of its presence. The prisoners were committed for trial at the assizes.—*Leicester Advertiser.*

Poisoning by Laudanum.

An inquest was held recently at Leicester upon the body of a young woman named Wykes. It appeared that as the deceased, who was a servant, did not come down at her usual time in the morning, the door of her room was forced open, when she was found lying dead on the floor. A small empty bottle was on the window sill, which was labelled "Laudanum, Poison." Deceased had been in the habit of using laudanum for the toothache. There had been some little unpleasantness between deceased and her employers, and it is probable that she expected to lose her situation.

Mr. Bowman, surgeon, who had been called in, said he had no doubt that the death was caused by an overdose of laudanum. The bottle was a half-ounce one, and if half full and the laudanum good, it would be sufficient to destroy life in a person unused to taking it.

Mr. Berridge, druggist, said he knew deceased by her coming to his shop. She had been in the habit of coming there occasionally to obtain a pennyworth of laudanum for the toothache and neuralgia. The last time was about three weeks previously, when she had a pennyworth of laudanum. The bottle produced had his label on it, and was the one she was in the habit of bringing. A pennyworth of laudanum would about half fill the bottle.

The jury returned a verdict "That deceased died from taking laudanum, but that there is not sufficient evidence to show what her state of mind was at the time."—*Leicester Advertiser.*

Obituary.

Died, on the 2nd of March, in his forty-sixth year, after a short illness, Dr. J. B. Henkel, Professor of Pharmacy in the University of Tübingen. Dr. Henkel was author of *Handbuch der Pharmacognosie*, Tübingen, 1867, and of an illustrated work on Pharmaceutical Botany (Tübingen, 1862), as well as of many separate papers on pharmacological subjects.

On the 10th March, at Hull, after a long and painful illness, Mr. Thomas Toogood, Chemist and Druggist, aged 65 years. Mr. Toogood held the office of alderman until a few weeks since, and was for many years a member of the Hull corporation.

On March 12th, 1871, after a few days' illness, Mr. John Tuck, 114, St. Aldate's, Oxford. The deceased gentleman was a zealous worker in the cause of pharmacy, and did everything in his power to forward the interest of the Society. He became a life member in 1863, and was but recently appointed Local Secretary for Oxford. Mr. Tuck was also Local Secretary for the British Pharmaceutical Conference.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[82.]—COLOURS FOR CARBOYS.—May I be permitted to place on record my experience in the use of the formula given for the above in the Number for Dec. 24th, in the hope that it may be useful to others?

The red, made strictly as directed by Mr. Hearder, gave a very satisfactory result (at the time), but a month's exposure in the window brought about rapid fading, and rendered necessary the substitution of another colour.

The blue, made also according to Mr. Hearder's formula, was very intense, so much so that about half the contents of the carboy had to be replaced by distilled water.

It proved, however, even more evanescent than the red; numerous flocks being soon deposited at the bottom, leaving the upper part of the liquid almost colourless.

I have substituted a formula from Beasley, and would only note that the quantity of nitrate of copper there ordered is largely in excess of that actually required. I speak advisedly when I say that one-tenth of the given weight would still err on the side of superfluity.

Without wishing to seem ungracious to the contributors of formulæ, would it not be well that some trial should be made of their working before publication, or that the user should be warned of his entrance upon wholly untrodden fields?

J. F. Brown.

[177.]—SALAD DRESSING.—In reply to "*Medicina*,"

Yolk of Eggs two
Table Salt $\frac{1}{4}$ oz.
Salad Oil 4 oz.
Mustard $\frac{1}{2}$ oz.
Best Vinegar 6 oz.
Isinglass 1 dram
Soluble—Cayenne 10 grains.

Quercus.

[190.]—BRONZONETTE.—"*Ignorant*" wishes to hear of a good receipt for an article called "Bronzonette," which answers admirably for bronzing busts and ornaments of various kinds. The fluid he has been using lately emits the disagreeable smell of common naphtha.

[191.]—SOLVENT FOR WHITE SHELLAC.—Will any reader kindly inform me what is the best and cheapest solvent for white shellac?—E. M. A.

[192.]—OXYGEN GAS.—Can any correspondent favour me with a cheap method for producing pure oxygen gas for inhaling?—J. D. M.

[193.]—LIQUOR OPII SEDATIVUS.—I should be very glad if any reader of the Pharmaceutical Journal could inform me how to make "Liq. Opii Sedativus."—Arthur T. Girdler.

[194.]—MIST. AMMONIACI CONC.—*A. T. Girdler* wishes to be furnished with a formula for making mist. ammoniaci conc., for preparing the mist. ammoniaci of the Pharmacopœia.

[195.]—COAL GAS.—Can any of my fellow-readers devise a plan whereby to use up a quantity of coal gas, excepting for illuminating or for a gas engine? I want to turn it into some practical use.—One in a Fix.

[196.]—MUSTARD LEAVES.—Will any reader kindly favour me with the best formula for preparing the above?—W. Y. Scruby.

[197.]—WHITE CEMENT.—*J. B.* would be glad if any reader could give a good formula for white cement, suitable for joining Spa ornaments to metallic mountings.

Correspondence.

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

The Proposed Poison Regulations.

Sir,—Forty years ago, I have myself sent out pound parcels of arsenic and cream of tartar, of "ox-vomit," white hellebore, linseed meal and rottenstone in the same butter-basket, with frequently no other than a written label, and sometimes, I fear, if in a hurry, not even that. I did it because it was the custom; because I was told to do so; and because I knew no better. It will be supposed, therefore, that I am not individually hostile to poison regulations. But have we made no advance since 1831? One would think, to judge by the stir made about poison legislation, that we had not; that things continued now as they were then.

I think a line between public and private acts may be sufficiently easily drawn. I think the public have no right to interfere with a man who only plays in private with edge tools for his own amusement and at his own risk; but if he throws them about to the manifest danger of others, he should be restrained from doing so; *i.e.* I think the public have no business to determine for me in what manner I shall keep the articles I deal in, while I acknowledge that it has every right to prevent my scattering them abroad to its own great danger and probable detriment. I object on principle to all excise or police interference whatever with me in the management of my private affairs. I consider a line of argument, based upon hopes or promises of leniency in carrying out a law, a line to be ashamed of taking one's stand upon. And I claim that my house, and shop too, be what unhappily an Englishman's house too often is *not*, my "castle." If a cry of murder alarms, a charge of cruelty be made, or reasonable suspicion of gross immorality, of knowingly secreting from justice vicious characters, stolen goods, or highly explosive compounds exist, storm it, and, if proved, sack it, if you will; but otherwise I hold that the said public, and its myrmidons of the law, have no right to enter but by my permission. And I hold, also, that laws should be impartial, and aim at the public good solely and exclusively. Therefore, if you exempt one man from all control over his mode of conducting a confessedly dangerous trade, solely because he is enabled—cheaply enough perhaps—to add surgeon or physician to his name, and fine another for the very same act, you are not impartial, you do not legislate for the public benefit solely, nor even chiefly,—for you make the knowing better than others the excuse for recklessness, whilst supposed ignorance aggravates the offence,—but for that of certain individuals, or to gratify the *animus* of a certain class. It is palpably most unjust that A. B. and C. D., both in the same street, both dealing openly in hair-oil, red precipitate, laudanum, quack medicines and vermin-killers should have a difference made between them, the one having his trade hampered with restrictions which are acknowledged to be unnecessary, by the very fact that it is not sought to apply them to the other. I say, too, that both public dispensaries of every kind, and those of private surgeons, should alike come under the same surveillance. And if the medical profession deny this, they transparently betray that they seek not legislation solely for the public good, but for the sake either of some special benefit to themselves or the gratification of some party spleen, though I by no means assert that, as a body, they do either. Still, this is a crucial test.

Having said thus much in opposition to the principle of such legislation, I will now add that I most cordially approve of the terms of all the proposed regulations, provided they come forth with no stronger enforcement than the recommendation of the Council of our Society. This ought to be enough, and it would be enough with all the well-disposed among its members, who most likely—indeed, it seems to be admitted on all hands that they do so—adopt them already. To the evil-disposed, such legislation is rather a gain than otherwise in the long-run. By the exercise of his wits he soon learns to evade the penalties of a new Act, and the honourably-minded man neither will nor can compete with him in doing so. It should be borne in mind that legislation for repression is not legislation for elevation. No one pretends that the pharmaceutical body will be cleansed, raised or "educated" by such proposed enactments; and it seems to me that the Council propose to cast a stigma upon themselves and upon those whom they represent, which at present only here and there an isolated individual besides is found rabid enough to do.

THOMAS LOWE.

Breckfield Road North, Liverpool,
March 11th, 1871.

Sir,—As a member and well-wisher of the Pharmaceutical Society, I cannot help sympathizing with, and feeling every confidence in, the Council in their desire to bring in the proposed Bill; but at the same time it appears to me, since examinations are compulsory, and education has ever been recognized as a public safeguard against cases of poisoning, the proposed compulsory regulations are quite unnecessary, and would rather impress the public mind with doubt as to our capability of managing our businesses, and lead them to ignore the fact of educational status, instead of increasing their confidence that every member of the trade would make such precautionary arrangements as his class of business, shop and warehouse accommodation and staff would suggest. It is not so much to the "regulations" themselves that I object, as to the fact of making them compulsory,—from what I can learn, those or similar arrangements being at present adopted in almost every dispensing establishment.

Further, these "regulations" would be incomplete unless, they applied to all other dispensaries besides those of chemists, such as surgeons', apothecaries', hospitals', and infirmaries', which need reform much more than our own.

With regard to the regulations themselves. To the first clause I cannot raise the slightest objection, as it is just what is at present almost universally adopted. To the second clause my objection is the classification of "poisons," as some persons would include henbane, digitalis, colchicum, etc., under this head, while others would not; if the list of "poisons" contained in the former Act is to include all that are to come under the new one, such outside drugs and preparations must be considered as non-poisonous, and consequently require no precautions as to storage and dispensing. I cannot see why "white" and "red precipitate," "oil of vitriol," "spirit of salts," "sugar of lead," and many other (I will call them) commercial articles, as also many essential oils, which have caused more accidents than those which come under the list, should be excluded. With regard to (B) of clause 2, using a bottle or vessel such as described would make the dispenser a mere machine; and then would arise the difficulty of distinguishing between various poisons, corrosive sublimate being distinguished while calomel would not,—thus depending on the sense of touch, rather than that of sight. This plan alone would, I believe, cause more errors than already occur. (C) of clause 2 greatly meets the requirements, provided all poisons (I mean such as are not in the last Act) were so included, which would be a matter of some difficulty, considering their number. Clause 3 is such as might be adopted with much advantage and security. On the whole I consider the already existing arrangements most satisfactory, and that chemists themselves are the best persons to regulate the keeping and dispensing poisons according to their own judgment, and as best suited to their individual requirements.

Finding that it has been the desire of the Council to ascertain each member's individual opinion is my apology for troubling you on this occasion.

JOHN H. LAKE.

41, *High Street, Exeter,*
March 13th, 1871.

Sir,—In the Journal of the 11th ult., I expressed my opinion that there was no necessity for restrictive legislation upon the matter of poisons. With your permission, I will make a few other remarks.

The errors of judgment made by the Council are now beginning to bear fruit, more particularly that very foolish one whereby they refused to take the sense of the trade throughout the country upon this subject. Upon a question of this importance, whereby the liberty of the trade is so much threatened, it must have occurred to the Council that a strong current of opinion would manifest itself in opposition to the scheme they suggested. The Council might have placed before Mr. Simon a protest numerously signed by the trade against any further pharmaceutical legislation, especially of a restrictive character; and also a statement, that any interference with the individual freedom and responsibility of the chemist and druggist would be encountered with the unanimous opposition of the trade. It is more than probable that the question would then have dropped, and with it would also have died the no little ill-feeling that has arisen.

In the statement of reasons issued by the Council is mentioned "the great privileges accorded to, and confidence reposed in the Pharmaceutical Society; to which, on the urgent representation of the Council, that the Society itself was the only judge of what would be practicable and adapted to the exigencies of trade in all parts of the kingdom," etc. Are we to deduce from the above that the Council desire that the majority of the 2000 members of the Pharmaceutical Society who elected them should arrogate to themselves so immense a superiority over their 10,000 brethren who have been contemptuously called "outsiders"? If so, the language is certainly worthy of the notorious Mr. Chollop, who, speaking of his brother Yankees, said, "We are the intellect and virtue of the airth, the cream of human natur', and the flower of moral force."

Does it not occur to the Council that strength has been given them, and consolidation to the whole of the trade, by the ready adhesion of these "outsiders" to the government of a Council which they do not elect? Has it never occurred to the Council that in event of any further parliamentary pharmacy the 10,000 "outsiders" may have accorded to them a voice in the pharmaceutical franchise? In these days of reform, Parliament would scarcely refuse so reasonable a request, and the status of the select few who now have the management might be somewhat altered.

After carefully considering the transactions of the Council upon this question, my opinion is that, notwithstanding their specious statement of reasons, they could have shelved the subject had they wished to do so. The eloquence of our President, which could dissuade even the sturdy Mr. Lowe from pressing his objectionable amendments, might, combined with the support of the trade, have convinced Mr. Simon that the Pharmacy Act had provided all that was necessary for the public safety.

The energetic proprietors of a popular contemporary have now also taken the question in hand. Let us hope that their efforts, and those of the Council, will not cause us to say, in the language of the lamented Artemus, "We are governed too much."

A COUNTRY PHARMACEUTICAL CHEMIST.

Sir,—After so recently troubling you with my views upon the "poison regulations," I should not again have thrust myself into the arena of conflict, had it not been for the appearance of Mr. D. W. John's letter in your last impression.

My object on the present occasion, is to endeavour to draw the earnest attention of all parties to that letter; and at the same time to say that I can, from personal experience and ample information, fully endorse every statement made therein as to the existing condition of things in not a few establishments, and I am fully persuaded the picture he has drawn is not too highly coloured.

I also agree with him as to the educational bearing. Education will not always make a man careful, nor will it *per se* prevent misadventure.

In two or three of the most distressing cases of accidental poisoning which have occurred within my memory, no attempt was made to explain the disasters by the want of proper educational acquirements, for the contrary was well known to be the truth of the case.

Then again, as Mr. John truly observes, in the majority of businesses it is absolutely necessary that there shall be apprentices and young assistants employed, and it seems to me that the "poison regulations" may be a safeguard. That they can be "a delusion and a snare," or the means of "making confusion worse confounded," is I believe perfectly absurd to imagine.

Quoting from Mr. John's letter, I say, "The fact that frequent recommendations and fearfully narrow escapes have failed to convince many of the necessity of adopting any precautions is, I think, sufficient to prove that nothing short of stern compulsion will secure the general adoption of any rules that may be proposed."

And for the same reasons it appears to me quite a farce to ask men who will take no pains for the establishment of proper arrangements, whether or not they object to being made to do so by compulsory regulations.

One thing, however, seems imperative, and that is, that if medical men will keep open shops for the sale of drugs, they should be liable to similar coercive regulations. Certainly, the public safety seems to require it quite as much in the one case as in the other.

ONE WHO HAS KNOWN THE DRUG TRADE MORE THAN THIRTY YEARS.

Sir,—Having carefully and regularly perused the very voluminous correspondence regarding the poison regulation question appearing in your valuable journal from week to week, it has occurred to me as somewhat strange that we have been favoured with so few editorial remarks on this very important subject, the more so from the fact of the Journal being the property of the Society, under whose auspices the regulations emanate.

I am certain that such would have been gratefully received, and might have tended to soothe the fears of those who consider they are about to be bridled with something of a very stringent nature, and put aright the vaunters of such frivolous excuses as we have seen in those pages since the regulations were mooted,—such as infringement of trade rights, compulsory education, on toxicological etiquette, etc.,—from members of the trade throughout the country.

There is one particular point about which I would like to clearly understand, viz. do the Pharmaceutical Council intend using their influence with the Medical Department of the Privy Council to extend the poison regulations to those who, under present circumstances, will be exempt by virtue of being under the wing of the medical profession? Surely, if the public safety demand a greater safeguard than exists at present from us, as examined druggists, the Privy Council cannot possibly object to a measure to include medical men, whose shops for the retailing of everything constituting the business of a chemist and druggist are in many cases their chief source of income,—as is the case in this city, where there are three retail shopkeeping surgeons to every druggist.

And I tell you, Sir, that on those grounds particularly, the regulations will be strongly opposed from this district.

In the Chemists and Druggists' Association of this city, of which I have the honour to be a member, there has scarcely been a single murmur against the poison regulations as issued by the Pharmaceutical Council, except that they are not universally adapted for the object in view.

A REGISTERED ASSISTANT.

Glasgow, March 7th, 1871.

[*** Our correspondent is referred to leaders at pp. 92 and 489 of the present volume, also to the statement of reasons issued by the Council.—ED. PHARM. JOURN.]

THE 'CHEMIST AND DRUGGIST' AND THE POISONS REGULATIONS.

Sir,—I enclose you a circular I received this morning. I can scarcely express the astonishment I felt when I read its purport. And so we are to have a Red Republic in pharmacy, I thought! Sir, I trust the pharmacists of this country will repudiate this scandalous and barefaced intermeddling busybodyism. What right has the *Chemist and Druggist* to call for a plebiscite of the trade? But I suppose it is a good stroke of business; and smells strongly of the shop—shoppy.

F. M. RIMMINGTON.

DISPENSING REFORM AND POISON RESTRICTIONS.

Sir,—I must say wonders never cease. It certainly is astonishing the amount of wisdom put forth and maintained by the promoters of Pharmacy Acts and amendments. If these people think they are going to elevate the trade by making stringent and oppressive laws, with respect to the selling, keeping and storing of poisons, the names of which are given in the schedules (each reformer having his pet scheme as to the kind of poison, the locality and the kind of bottle and label), they are much mistaken. Any man who has his reason would, for his own sake, take the amount of precaution necessary in these things. But if a man is careless, no Act of Parliament will make him careful; it may punish him when he has made a mistake. And, again, these reformers must know, if they are or have been at all connected with the trade, that the sale of most of the poisons mentioned in the schedules is very small, and the amount of profit so small that it would not pay for the least possible alteration, *i. e.* distinguishing bottles, cupboards, partitions, etc.

I think we, who have spent our time and money in passing the examination, should have a little more justice done us by these reformers. Would it not be far better for them to try to enlighten the conscience of those men who charge for dispensing the following prescription for pills at one shilling per dozen:—

℞. Pepsin. Porci gr. vj
Ferri Redact. gr. j
Sol. Æther. Phosphori ♏ij
Pulv. Rhei gr. j
Pulv. Capsici gr. j
Mucilaginis q. s. fiat pilula.

The twelve pills would contain 72 grains of pig-pepsin. What profit would there be for the dispenser who faithfully prepares these pills at a shilling per dozen? At the same establishment the charge for eight-ounce mixtures, one tablespoonful doses, is the enormous sum of eightpence; and also one shilling was charged for the following:—

℞. Chlorodyne, C. B.'s, ʒiij
Aq. ad ℥viij
St. ℥j, omni nocte.

This has been done by one who has been in business, I believe, over forty years, in one of the best situations in a large manufacturing town,—one who stands amongst the "founders," a "member" of the "Society" and the "Conference," and a local secretary. Such line of conduct might have been passed over had he been "hard-pushed," or a young man just "commencing." But it is far from it. I should blush to give the name of the town in which I reside, though it might be said to be justice to the trade to do so. I refrain for pity's sake.

Now, with respect to the poison question. I will give you a rule which, if observed, is the only way to prevent poisoning by accident. 1st. Have every bottle or parcel distinctly labelled. 2nd. That the bottle or parcel contain the article indicated by the label. 3rd. In dispensing, keep the mind upon the work; look at and read every label before taking out the stopper; examine every weight before putting it into the scale pan; and in measuring, let nothing else but the quantity and article occupy your mind. 4th. Do everything by system. 5th. Do nothing by "use." 6th. Use best articles, and charge according to the class of customer. If first-class, charge accordingly. If you have mostly poor people, adapt your charges to their circumstances; but never charge less than cost price, for that is dishonest to yourself and fellow-dispenser. If your customer is too poor to pay you, give him a bottle or two of medicine, for if he cannot pay for his medicine he will not be able to pay the doctor. But, instead of the poor, it is those that are able to pay who, in an extra prescription, are charged under cost price, in order to "catch," or are afraid lest it should give an offence.

I think it would be much better for our pharmacy reformers to look at these rules with their minds unprejudiced. They would find it much better than their distinguishing bottles, separate cupboards and partitions scheme.

Now a word of common sense to our Council and pharmacy reformers. We are in the trade, and have a right to live by it. I would say, then,—Do not oppress the trade with a lot of measures unnecessary and unprofitable. Do all you can to protect our interests, and to obtain for us the sole right to deal in drugs, and to sell castor oil, salts, senna, and all those things which are the chief source of revenue to us. Do all you can to keep the sale of such articles from those who do them for a grocer's profit, for it is well known we cannot live upon $2\frac{1}{2}$ per cent. on our small returns; we should not have the pleasure of paying much income-tax. Try to do something to regulate the present system of so-called "wholesale druggists" in large towns. Many inquiries are made, What do you charge for so much of so-and-so? When the price is mentioned, their reply is, "Oh! we pay so much at the wholesale druggists." Attention is required to this far more than to poisons.

A PHARMACEUTICAL CHEMIST BY EXAMINATION.

Dispensing Prices.

Sir,—If it will not be encroaching on your valuable space with what, I am sorry to say, has become a thing of frequent occurrence, I should like to add another example of that pernicious and despicable system of undercharging.

A few days since, a person, whose outward appearance certainly bespoke respectability, brought the following prescription, and desired to know what we should charge for dispensing it:—

℞. Quiniæ Sulph. ℈j
Acid. Nit. Dil. ʒij
Acid. Hydrochlor. Dil. ʒj
Sp. Æth. Chlor. ʒj
Aquæ Dest. ad ℥xij.
M. ft. mist. Sumat coch. amp. ij bis dic.

2*s.* 3*d.*, including bottle, was the price mentioned, which was, if anything, insufficient, considering the amount of quinine, besides the fact of there being sufficient to last the patient six days. She then said that she never paid more than 1*s.* 8*d.* for it, and had had it for that amount at a chemist's in the north-west of London, at the same time stressing the fact that his establishment was on a large scale. On referring to the Register, I find that he is a Pharmaceutical Chemist by Examination, and also a member of the Society, and his shop is in one of the most fashionable districts of London. It seems to me that notwithstanding all our boasted education and strenuous measures to improve the trade, the modern chemists forget the proverb "Live and let live," and try as far as possible to injure themselves and the trade in general.

Grumbler.

Sir,—The following prescriptions were brought to me some time since to be dispensed:—

℞. Quin. Disulph. ʒij
Sp. Æth. Chlor. Destil. ʒij
Tinct. Ferri Sesquichlor. ʒiij
Mist. Camph. ad ℥vj
Ft. mist. Capiat coch. ampli bis terve die.

Aug. 7th, 1866. T. W. G.

When I told the person what I thought a reasonable charge was, I was indeed almost insulted, for I was told that at every place in London where it had been dispensed they had only charged 1*s.* 6*d.* Can anybody tell me what was used instead?

℞. Codeiæ gr. j⅔
Ext. Nucis Vom. gr. j
Ext. Calumbæ gr. ij.
Ft. pil. et rep. ad xxiv, cap. ij ter dic.

This, I was told, was charged the usual price for two dozen pills, viz. 1*s.* Codeia cost 26*s.* per oz.; what could have been used in this case? These pills have been taken regularly since the beginning of March last year until the end of July. Is not the dose of nux vomica rather strong?

Video.

Pharmacy in Ireland.

Sir,—I have read with great pleasure the letter of your correspondent "Aliquis" on the above subject, and I believe his opinions to be those of the majority of the respectable apothecaries in this country.

I hope that the few letters which have so far been published will show the leaders of the "Pharmaceutical Society" the real position of the druggists of Ireland, which (judging from some of the articles which have appeared in the Journal) I think they have unfortunately misunderstood, considering them analogous to the chemists and druggists of England and Scotland.

I may here say that the reason why the druggists have not expressed their opinions in the Journal, as invited, is that they scarcely ever see it, the matter therein contained being entirely foreign to their line of business.

With regard to the complaint that the apothecaries have an undue monopoly, it would be a very similar case if, in seventy years' time, the grocers of England were to complain that while they (the grocers) were allowed to sell drugs, such as castor oil, etc., they were not allowed to compound medicines under a heavy penalty. Of course the answer would be that the privilege was theirs on passing the necessary examination; and this is the case with regard to the Irish druggists, with this exception, that in England the examination is confined to subjects necessary for the proper discharging of their duties as dispensing chemists, while in Ireland unfortunately it is not so; and this, together with the assimilation of the laws which govern the two countries, would seem to be the principal advantages gained by making a change in the present system; for, so long as a sufficient number of gentlemen think their remuneration as apothecaries a sufficient reward for the high education required of them, I do not see any other ground on which to complain of their monopolizing the dispensing part of the profession. Of course, if they abused that monopoly by charging exorbitant prices, etc. there would be more ground for complaint; but this is not the case.

In conclusion, I think the Pharmaceutical Society might with advantage frame a Bill similar to the one proposed by the Apothecaries' Hall, omitting the Modified Examination for druggists, which was necessary in England to protect existing interests, but is not so in Ireland. Such a Bill will be far less likely to meet with opposition from the apothecaries, in the face of which it is scarcely possible that any measure on the subject could become law.

Oswald A. Reade,
Belfast. *Local Secretary.*

Exemption from Serving on Juries.

Sir,—As according to the present Act of Parliament pharmaceutical chemists only are exempted from serving on juries, and as the same duties and obligations devolve on chemists and druggists, I think it only just that the same privilege should be extended to the whole of the trade.

Such a measure would tend to remove any existing jealousies between the two departments, and they would be enabled to act more in concert for the general welfare.

A short Act could easily be introduced to Parliament for the purpose.

7, *Wheeler Street, Birmingham,* James A. Foster.
2nd March, 1871.

Louisa Plumbley.—We are of opinion that clause 16 of the Pharmacy Act, 1868, which creates exceptions, must be strictly construed in favour of the public, so that the widow of a deceased chemist and druggist will not stand in any more favoured position than any descendant, ancestor, or collateral relative of a deceased chemist and druggist would stand in. In short, that no relative of a chemist and druggist can claim any special exemption in right of the relationship, and the only persons who can claim the special exemption are those who stand in the position of trust as defined in the statute.

W. Hartley.—No.

"*Tonic*" (Watford).—You will find the information you require concerning quinine wine given in a letter printed on p. 519 of the present volume.

"*Omega*" will find the formula for Dr. Coffin's composition powder on p. 457 of the present volume.

C. E. W.—The formula for Easton's syrup has been already given in the present volume, p. 377. See also the correspondence respecting it on pp. 397 and 419.

T. W. (Scarborough).—We are informed that the third edition of Attfield's 'Chemistry' is now being printed, but that it is intended chiefly for American circulation, being adapted to the United States' Pharmacopœia.

"*Aroma.*"—The 'Journal of the Society of Arts' is published by Messrs. Bell and Daldy, York Street, Covent Garden.

⁂ We are compelled to defer the publication of several letters until next week.

The following journals have been received:—The 'British Medical Journal,' March 11; the 'Medical Times and Gazette,' March 11; the 'Lancet,' March 11; the 'Medical Press and Circular,' March 16; 'Nature,' March 9; the 'Chemical News,' March 10; 'Journal of the Society of Arts,' March 9; 'Gardeners' Chronicle,' March 11; the 'Grocer,' March 11; 'Produce Markets Review,' March 11; the 'English Mechanic,' March 10; the 'Chemist and Druggist' for March; the 'New York Druggists' Circular' for February.

Communications, Letters, etc., have been received from Mr. T. P. Blunt, Mr. T. A. Reeve, Mr. J. Barker, Mr. F. B. Benger, Mr. D. H. Warwick, Mr. M. C. Cooke, Mr. F. Coles, Mr. S. Dean, Mr. Cohen, Mr. D. Anderson, Mr. W. Lee, Dr. Steele, Mr. W. W. Stoddart, "Alpha," "Nil sine Labore," "Vincit Amor Patriæ," "Senega," "Apprentice," C. W., A. O. Z., T. E. R., J. H.

SYRUP OF PHOSPHATE OF IRON

AND OTHER SYRUPS CONTAINING PHOSPHORIC ACID.

BY MICHAEL CARTEIGHE.

Of the numerous preparations of iron at the disposal of the practitioner few have in late years acquired more favour than the syrup of the phosphate. First introduced to the notice of the profession by Mr. Greenish* in a form more or less opaque, it was not until about ten years ago that it came into very general use. About this time Gale and Schweitzer each read a paper† at one of the evening meetings of the Pharmaceutical Society, detailing processes for the preparation of this syrup in a form which should remain perfectly bright and free from deposit. Gale's process was introduced into the British Pharmacopœia of 1867, and since the publication of that volume the demand for this medicine has vastly increased. Its tendency to darken in colour after having been kept for some time was soon noticed, and Umney‡ made some experiments with the view of preventing or retarding this change, but the results were not practically satisfactory. T. B. Groves§ afterwards examined a very old specimen in his possession, and determined the chemical composition of the precipitate, which is formed on long standing. He describes this precipitate as being essentially a compound of iron with phosphoric acid, corresponding to the octocalcic phosphate of Warington. The dark colour he thinks due to the production of caramel by the action of the phosphoric acid and iron salt upon the sugar. He also prepared several specimens with a stronger acid, made by himself from amorphous phosphorus, and found that these kept somewhat better than when made according to the B. P.

The necessity of keeping the syrup recently prepared induced me to try a few experiments with a stronger acid, and to devise a shorter process than that of the B. P. This has doubtless already suggested itself to, and been practically tested by, other chemists, but, so far as I am aware, it has not hitherto been published. It is as follows:—

SYRUP OF PHOSPHATE OF IRON.

Phosphate of Iron	96 grs.
Water	9 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	7 fl. drms.
Syrup	10 fl. oz.

Rub the phosphate of iron with the water in a glass mortar, add the phosphoric acid and filter the mixture into the syrup.

As thus prepared, it contains the same proportion of iron, about 2 minims less of the dilute acid (25 instead of 27), and rather more sugar than when prepared according to the Pharmacopœia.

The phosphate of iron is made by the B. P. process, and dried at a temperature not exceeding 100° F. The specimens I have found in the ordinary course of trade are not readily soluble in the acid. This want of solubility is, I believe, due to the length of time they have been kept before sale.

* Pharm. Journ. Vol. X. p. 534.
† Pharm. Journ. 2nd series, Vol. I. p. 497.
‡ Pharm. Journ. 2nd series, Vol. VIII. p. 129.
§ Pharm. Journ. Vol. XI. p. 138.

I have obtained the best results with phosphate only a few days old, and find it advantageous to make as much as is required frequently.

Syrupy phosphoric acid of sp. gr. 1·500 may now be obtained of any manufacturing chemist, and according to Dr. Watts's table,* contains about 50 per cent. of P_2O_5. It is made by the action of nitric acid on phosphorus, the excess of acid being driven off in a platinum vessel.

Manganese is sometimes prescribed with or without iron, and according to Pereira, the former is a useful adjunct to ferruginous preparations, and occasionally a desirable substitute for them.

SYRUP OF PHOSPHATE OF MANGANESE

May be prepared in a similar manner with the following ingredients:—

Phosphate of Manganese	96 grs.
Water	9 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	7 fl. drms.
Syrup	10 fl. oz.

Strength—1 *grain phosphate of manganese and acid equal to about* 25 *minims of the dilute phosphoric acid in each fluid drachm.*

The phosphate of manganese is made in the same manner as the phosphate of iron, substituting sulphate of manganese for the ferrous sulphate.

SYRUP OF PHOSPHATE OF IRON WITH MANGANESE.

Phosphate of Iron	72 grs.
Phosphate of Manganese	48 grs.
Water	8 fl. drms.
Syrupy Phosphoric Acid	8 fl. drms.
Syrup	10 fl. oz.

Rub the powders with the water, add the acid and filter into the syrup.

Each fluid drachm contains ¾*-grain phosphate of iron,* ½*-grain phosphate of manganese and acid equal to about* 30 *minims of the dilute phosphoric acid, B.P.*

The tendency of modern practitioners of medicine to encourage the exhibition of substances which may assist in the formation of bone, etc., has led to the introduction of the—

SYRUP OF PHOSPHATE OF IRON AND LIME.

Take of Phosphate of Iron	96 grs.
Phosphate of Lime	192 grs.
Water	8 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	8 fl. drms.
Syrup	10 fl. oz.

Mix the powders with the water in a glass mortar, add the acid and filter into the syrup.

Each fluid drachm contains 1 *grain of phosphate of iron,* 2 *grains of phosphate of lime, and an amount of acid equal to about* 30 *minims of the dilute phosphoric acid, B. P.*

The phosphate of lime is made by precipitation from solutions of chloride of calcium and phosphate of soda, and dried at 100° F., and should not be kept too long before use. That made from *bone ash*, as the Pharmacopœia directs, is much less readily soluble.

The following formulæ may be useful as an appendix:

* Pharm. Journ. 2nd series, Vol. VII. p. 191.

SYRUP OF PHOSPHATE OF ZINC.

Phosphate of Zinc	192 grs.
Water	11 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	5 fl. drms.
Syrup	10 fl. oz.

Rub the phosphate with the water, add the acid and filter into the syrup.

Each fluid drachm contains 2 *grains of zinc phosphate and about* 18 *minims of dilute phosphoric acid.*

SYRUP OF PHOSPHATE OF QUININE.

Take of Phosphate of Quinia*	96 grs.
Water	$13\frac{1}{2}$ fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	$2\frac{1}{2}$ fl. drms.
Syrup	10 fl. oz.

Mix the acid with the water, add the quinia and filter into the syrup.

Each fluid drachm contains 1 *grain of phosphate of quinine and acid equal to about* 10 *minims of the dilute phosphoric acid.*

SYRUP OF PHOSPHATE OF IRON WITH QUININE.

Take of Phosphate of Iron	192 grs.
Phosphate of Quinia*	96 grs.
Water	7 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500	9 fl. drms.
Syrup	10 fl. oz.

Rub the powders with the water, add the acid and filter into the syrup.

Each fluid drachm contains 2 *grains of phosphate of iron and* 1 *grain of phosphate of quinine.*

SYRUP OF PHOSPHATE OF IRON, QUININE AND STRYCHNINE.

Easton's Syrup.

Take of Phosphate of Iron	192 grs.
Phosphate of Quinia*	96 grs.
Strychnia (in crystals) . . .	3 grs.
Water	7 fl. drms.
Syrupy Phosphoric Acid, sp. gr. 1·500.	9 fl. drms.
Syrup	10 fl. oz.

Rub the phosphate of iron with 5 drachms of the water in a glass mortar, dissolve the strychnia and quinia in the acid, previously mixed with the remaining 2 drachms of water; mix and filter into the syrup.

Each fluid drachm contains 2 *grains of phosphate of iron,* 1 *grain of phosphate of quinine and* $\frac{1}{32}$*nd part of a grain of strychnine.*

SYRUP OF PHOSPHATE OF IRON AND STRYCHNINE

May be prepared in the same manner as the last, omitting the phosphate of quinine.

I am conscious of the objections which may be urged against the prescribing of these *compound* preparations, but in the face of the constant and increasing demand for many, it appears to me futile to attempt to discourage them by declining to publish formulæ. Such a course tends to perplex both the medical profession and pharmacists and to the introduction of quasi-secret remedies of unknown, and possibly of uncertain, strength.

172, *New Bond Street, W.*

* The same weight of quinia, prepared by precipitating an acidulated solution of the *disulphate* by solution of ammonia, collecting, washing and drying at 100° F., may be used, in the absence of the phosphate.

NOTE ON OPIUM CULTURE.

BY GEORGE W. KENNEDY.

In a letter to the editor of the *American Journal of Pharmacy*, the author informs him that he has procured poppy seed from abroad, and supplied it to a friend in Illinois, with the view of trying an experiment in opium culture. The seeds were planted in rows two and a half feet apart, in well-manured, rather dry soil and in moist soil. The seed sown in the wet soil failed. The plants received good garden culture, and attained a height of three feet. After the petals had fallen, and the capsule attained some size, horizontal incisions were made around the capsules in the afternoon, and the exudation removed in the morning and dried in the sun. Some of the capsules failed to yield any juice, owing to the wound being too deep, and the juice passing into the cavity of the capsule. The yield of opium was small, many of the plants being imperfect. Mr. Kennedy made a partial examination of it, and detected meconic acid; and when treated by Mohr's process, with subsequent crystallization of the precipitate from alcohol, yielded 8·75 per cent. of morphia crystals, which gave the proper reactions with nitric acid and chloride of iron.

Mr. Kennedy hopes to make a more successful experiment next year.

SULPHO-CARBOLATE OF ZINC.

In a letter to the editor of the *American Journal of Pharmacy*, Dr. A. B. Lyons, of Detroit, recommends the following process for the preparation of sulpho-carbolate of zinc as simple, economical and satisfactory:—A crude sulpho-carbolic acid is first prepared in the usual way, by heating together sulphuric and carbolic acids—seventeen parts of the former to sixteen of the latter. This is diluted with ten times its volume of water, and saturated with carbonate of lead. Into the filtered solution of sulpho-carbolate of lead is introduced a quantity of pure granulated zinc, equal in weight to the carbolic acid employed. At the end of twenty-four hours the solution will usually be found free from lead, giving no precipitate with sulphuric acid or potassium iodide. When quite freed from lead, as indicated by these tests, the solution is decanted, heated to boiling, filtered and evaporated to a small bulk to crystallize; or the evaporation is carried to complete dryness, the salt being obtained in the granular form. The salt procured in this way is of necessity free from sulphate, and yields fine large colourless crystals, without any empyreumatic odour.

BORAX.

The *New York Druggists' Circular* states that it may not be generally known how very valuable borax is in various purposes of household use. We find it the very best cockroach exterminator yet discovered. One half-pound, costing but fifty cents, has completely cleared a large house formerly swarming with them, so that the appearance of one in a month is quite a novelty. The various exterminating powders puffed and advertised have been found not fully effective, tending rather to make the roaches crazy than to kill them. There is something peculiar, either in the smell or touch of borax, which is certain death to them. They will flee in terror from it, and never appear again where it has once been placed. It is also a great advantage that borax is perfectly harmless to human beings; hence no danger from poisoning. It is also valuable for laundry purposes. The washerwomen of Holland and Belgium, so proverbially clean, and who get their linen so beautifully white, use refined borax as washing-powder instead of soda, in the proportion of a large handful of borax powder to ten gallons of water. They save soap nearly one-half. All the large washing establishments adopt the same mode. For laces, cambrics, etc., an extra quantity of the powder is used; and for crinolines (requiring to be made stiff) a stronger solution is necessary. Borax, being a neutral salt, does not in the slightest degree injure the texture of linen. Its effect is to soften the hardest water, and therefore it should be kept on the toilet table. As a way of cleaning the hair, nothing is better than a solution of borax in water.

SOLVENT POWERS OF GLYCERINE.

The following table of the solubilities of various chemicals in one hundred parts of glycerine is given by Klever (*Pharm. Zeitsch. f. Russ.*):—

Arsenious Acid	20
Arsenic Acid	20
Benzoic Acid	10
Boracic Acid	10
Oxalic Acid	15
Tannic Acid	50
Alum	40
Carbonate of Ammonia	20
Muriate of Ammonia	20
Tartarated Antimony	5·50
Atropia	3
Sulphate of Atropia	33
Chloride of Barium	10
Brucia	2·25
Sulphide of Calcium	5
Cinchonia	0·50
Sulphate of Cinchonia	6·70
Acetate of Copper	10
Sulphate of Copper	30
Tartarated Iron	8
Lactate of Iron	16
Sulphate of Iron	25
Perchloride of Mercury	7·50
Cyanide of Mercury	27
Iodine	1·90
Morphia	0·45
Acetate of Morphia	20
Muriate of Morphia	20
Phosphorus	0·20
Acetate of Lead	20
Arseniate of Potash	50
Chlorate of Potash	3·50
Bromide of Potassium	25
Cyanide of Potassium	32
Iodide of Potassium	40
Quinia	0·50
Tannate of Quinia	0·25
Arseniate of Soda	50
Bicarbonate of Soda	8
Borate of Soda	60
Carbonate of Soda	98
Chlorate of Soda	20
Sulphur	0·10
Strychnia	0·25
Nitrate of Strychnia	4
Sulphate of Strychnia	22·50
Urea	50
Veratria	1
Chloride of Zinc	50
Iodide of Zinc	40
Sulphate of Zinc	35

Burns and Scalds.—Dr. S. B. Judkin, in a communication to the *Journal of Materia Medica*, says that he has successfully treated many cases of burns and scalds by dissolving white-lead in linseed-oil to the consistency of milk, and applying it over the entire burn or scald every five minutes with a soft feather. He has used it a great many times during fifteen years of practice, and found it to give relief sooner, and to be more permanent in its effects, than any other preparation.

THE PROPOSED POISON REGULATIONS.

MEETING OF CHEMISTS IN NOTTINGHAM.

A General Meeting of the Chemists of the town and district, was held in the rooms of the Nottingham and Notts Chemists' Association, on Friday, the 10th of March; Mr. J. H. Atherton, the President of the society, in the chair.

The meeting was well attended and unanimous in its expression.

The following resolutions were adopted:—

Proposed by Mr. W. H. Parker, seconded by Mr. T. B. Fletcher,—

"That in the opinion of this Meeting, the proposed institution of compulsory regulations for the keeping and dispensing of poisons is unwise, and an unnecessary interference with the freedom and independence of the trade."

Proposed by Mr. Fitz-Hugh, seconded by Mr. Mayfield,—

"That the importance of the proposed measure demands that the opinion of members of the Pharmaceutical Society should be taken, before the Annual Meeting in May. This Meeting would urge the Council to issue with the voting-papers a form, to be filled up by each member, requesting his opinion, 'Ay' or 'No,' on the subject, in order to ascertain definitely the views of the trade."

Proposed by Mr. Blankney, Arnold, seconded by Mr. F. White,—

"That this Meeting approves of the objects of the Defence Association, and hereby agrees to support its efforts."

Proposed by Mr. Oakland, seconded by Mr. Lewis,—

"That the resolutions arrived at by this Meeting be printed and circulated throughout the town and neighbourhood."

MEETING OF CHEMISTS AND DRUGGISTS AT HULL.

On Wednesday evening, the 15th inst., a large and influential Meeting of Chemists and Druggists of Hull and neighbourhood was held at the Cross Keys Hotel, Market Place, to take into consideration the proposed poison regulations. On the motion of Mr. Gales, seconded by Mr. Smith, the President of the Hull Chemists' Association (Mr. Baynes) was called upon to preside.

The Chairman in opening the proceedings said they were called together, as they were doubtless well aware, for a most important purpose, the consideration of a question which was of vital importance to the trade generally. The Hull Chemists' Association had previously taken action and placed on record their opinion on the matter. It had, however, been thought fit, under the present circumstances of the case, to call a meeting of the trade; and as some persons must take the initiative, he and the Secretary (Mr. Bell) had chosen to do so. The meeting was one of the entire trade, and every gentleman would be at liberty to express his opinions on the proposed regulations. He trusted the gentlemen would speak with calmness, good temper and with as much brevity as was consistent with what the speaker desired to say. The poison regulations, unless their enactment was defeated, were about to be made the means of placing the chemists under very stringent regulations, which were not intended to apply to any other class of dealers in medicines. The action which their committee had previously taken was, he was informed, to the utter condemnation of the scheme proposed by the Council, and he had very little doubt the result of their present meeting would show that they rightly judged the general feeling of the trade. Certain resolutions had been prepared for the meeting, but they had only been drawn for the purpose of facilitating business, and would be open for discussion. A memorial would be read, but the meeting would be at liberty to mar or amend it as they thought fit. Personally he had no very strong objections to the poison regulations, so long as he was allowed to do as he liked about them, but he should strongly object to their being forced on him by law. At present he was allowed, and did make such arrangements as he thought would conduce to the safety of his customers, and he had no doubt every other chemist in the district did the same. With regard to the suggestion of Dr. Simon as to angular bottles, it was merely one of his crotchets. Some gentlemen had an idea that they could prevent cases of poisoning; he thought the chemists might congratulate themselves that of late years the cases of poisoning had been very few. Some of the cases occurred where rules as stringent as those to be imposed had been in operation. The Chairman concluded by referring to the memorial, which he read, and expressing his belief that nearly the whole of the seventy or eighty chemists in the town would sign it. The memorial is as follows:—"The undersigned chemists and druggists of Hull having had their attention drawn to the proposed poison regulations which the Council intend bringing before the Annual Meeting of the Pharmaceutical Society in May next, with a view to their adoption, hereby desire to record their dissent from the said propositions, and respectfully urge upon the Council the danger and impolicy of partial legislation on the subject of poisons; and your memorialists further desire to impress on the Council in the strongest manner that, in their opinion, no regulations can be deemed satisfactory to the trade which do not apply alike to surgeons, veterinary surgeons, hospitals and dispensaries (by whom, by far, the greater portion of medicine is supplied), as well as to chemists. The third regulation is very objectionable, and has a direct tendency to favour the conclusion that any medicine not in a "danger bottle" is necessarily harmless, and it would probably lead to serious accidents. It is very questionable, in the opinion of your memorialists, whether any regulations, capable of universal application, can be devised which are likely to press with such constant force on the minds of chemists and druggists as that of the tremendous responsibility now existing."

Mr. A. Pickering then moved the following resolution:—"That this meeting, whilst fully recognizing the duty of every pharmaceutical chemist and chemist and druggist to take all due precautions against mistakes and accidents, and securing the safety of the public when dealing with poisons or dangerous articles, does not consider the enforced adoption of the proposed regulations for keeping and dispensing poisons to be either necessary or desirable; and that a memorial be prepared and presented to the Council, objecting to the proposed poison regulations." He observed that, in the first place, he considered the regulations proposed by the Pharmaceutical Society were absurd; in the second place, impracticable; in the next place, an unnecessary interference with business; and, lastly, they were regulations that could not be carried out. All chemists and druggists knew the injurious effect which a case of poisoning had upon a person's business, and he believed the great majority of chemists used every ordinary care to prevent accidents. During an experience extending over twenty years, he had never had a single case of poisoning or anything approaching to a serious mistake, in his shop. The ordinary precautions which most chemists exercised were used, viz. labelling poisons and articles for external application as such. He was persuaded that no regulations could be made which would prevent persons from committing suicide who had once allowed such an idea to obtain possession of their minds. With regard to the dispensing of poisons, generally speaking, the principal of a business kept a very strict eye upon everything poisonous; and he was not aware that any alteration in the shape of bottles, or the assignment of a particular place in the shop for them, would have any influence at all in the prevention of accidents. The idea of keeping all poisons under lock and key was quite incompatible with trade. Barrels of arsenic, casks of sheep-dipping, and other articles largely used, could not be so stored. He really did not see how any regulations could be so universally applicable as to prevent accidents of the nature in question. He considered the best means to prevent accidents was to have those connected with them possessing a sufficient knowledge of the properties of the articles dealt in. If left in the hands of those educated for the business, he had very little doubt but that all ordinary care would be exercised, and as few accidents take place as was within the bounds of possibility.

Mr. C. B. Bell seconded the resolution, and, in doing so, trusted the meeting would pardon him if he made any mistake, for he should endeavour to be as brief as possible. At the last Annual Meeting, held in May, they would remember that these poison regulations came on for discussion, and that, after a very stormy meeting, they were voted against; and a resolution was passed that the incoming Council should consider them during the ensuing year, and report on them to the next Annual Meeting. Last December a letter from Mr. Simon, calling the attention of the Council to them, was brought forward. On the 1st of February they came on for discussion again, when ten of the Council voted in favour of the compulsory poison regulations, and four against them. A resolution was moved, "That the sense of the members of the Pharmaceutical Society should be taken on the regulations," but that proposal was outvoted. Personally he had strong objections to the regulations; and he agreed with Mr. Pickering that, though many of them might endeavour to carry them out, it was incompatible to do so entirely. He considered that, if passed, the regulations would act very injuriously on their trade. Take, for instance, the town of Glasgow. If the regulations became law, they would press heavily on sixty pharmaceutical chemists and chemists and druggists, but they would not touch the hundred and twenty physicians, etc. keeping open chemists' shops. That was a piece of inconsistency in legislating which ought not to exist. At the last Annual Meeting a beautiful elegy was preached by one of the Council, who asked them to put themselves out of the pale of the Society for a short time, and inquire of themselves what their feelings would be if they had a friend or dear child poisoned by mistake; he asked what must have been the feelings of that poor chemist in Lancashire, who, a few weeks ago, lost his child by poison administered through the mistake of a surgeon's dispenser? That was another reason why they should oppose the proposed regulations. He had the honour of voting against them last year, and he trusted every member would endeavour to be present and oppose them next May.

At the suggestion of one of the gentlemen present, Mr. Bell read the proposed regulations.

Mr. Gales observed that they all agreed that the regulations, if passed, would be a grievance inflicted upon the trade; they all felt they had grounds for complaint against those parties who were introducing the regulations, and endeavouring to make them law. In remedying any grievance, or in counteracting the effect of any mis-legislation, it was necessary, in the first place, to draw a correct diagnosis, and to ascertain the cause from whence the evil sprang; he took it that it arose from the chemists and druggists of Great Britain having incautiously committed the governing power to the Pharmaceutical Society. His views had been before the trade from the commencement of the agitation of the rights of chemists and druggists. Those gentlemen who possessed copies of the *Chemist and Druggist* would be able to place their fingers on articles he had written in that periodical, in which he had deprecated the continuance of the governing power in the hands of any section so small as the Pharmaceutical Society. He did not find fault with them availing themselves of the privilege; they were in perfect order, they having a right by law, as the governing body, to pursue what course they thought proper. The chemists and druggists had pledged themselves to abide by any regulations which the Pharmaceutical Society should pass, therefore it was not so much against the Pharmaceutical Society as against themselves they ought to complain, in having put confidence in man. They had an opportunity some years ago, when the Bill was before the House, of resisting it, and they had the power in their own hands. As non-pharmaceutical chemists, as they were often called, although many of them understood pharmacy and practised it as much as some, the present was only the first instalment arising from such a course of procedure. He would object to memorializing the Pharmaceutical Society, as they had taken no notice of the registered chemists; they were governed without being consulted, they were not represented on the Council, although they had a claim to have seven out of twenty-one, and he questioned whether there was one registered chemist on the Council. It was contrary to British liberty and to British legislation that men who were not represented should be legislated for, without being consulted in the slightest degree, and asked to submit to any law they wished to make. He objected to the resolution proposed, as their remedy was in the House of Commons; he should propose that a memorial against the regulations be drawn up and sent to the Privy Council.

Mr. Akester seconded the amendment.

The Chairman said he did not see how they could approach the House of Commons on the subject; no doubt the Medical Council had moved in the matter through Mr. Simon, and it was with the Council of the Pharmaceutical Society we had to remonstrate, but he did not care what course was adopted so long as the proposals were upset.

The amendment was then put, and only three hands held up for it, it was declared lost. The original motion was then put and carried.

Mr. Myers proposed "That whilst chemists generally would doubtless welcome, and, as far as possible, adopt any suggestions tending to lessen the risk of accident, this meeting is of opinion it is practically impossible to lay down any rigid rule applicable to all establishments alike, with respect to the keeping, selling and dispensing of poisons, and the enactment of such a law would seriously trammel and increase the responsibility of chemists and druggists without leading to greater safety on the part of the public."

Mr. Hollingsworth seconded the resolution, which was earnestly supported by Mr. A. Smith and carried.

Mr. Smith moved "That this meeting considers it would be an act of great injustice and severity to the chemists and druggists of England and Scotland should the proposed regulations be enforced upon them, whilst surgeons, veterinary surgeons, and dispensaries are exempted, and would expose the public to greater danger from varying customs, than if no such unwise attempt been made." This was seconded by Mr. Barlow, supported by Mr. Gales, and carried unanimously.

Mr. Earle proposed the following resolution: "That this meeting deeply regrets that the Council of the Pharmaceutical Society had not decided to take the sense of the trade prior to the Annual Meeting, as suggested by Messrs. Woolley and Brown," which was seconded by Mr. Akester, and carried unanimously.

Mr. Staning moved "That assistance be given to the Defence Association by subscribing to its funds," which was seconded by Mr. Smith.

Mr. Gales objected to the subscriptions being sent to the Association at Manchester, and moved an amendment, that they be sent to the United Society of Chemists and Druggists, which, not finding a seconder, the original motion was put and carried.

A hearty vote of thanks to the Chairman closed the meeting.

MEETING IN LIVERPOOL.

A Meeting of the Chemists and Druggists of Liverpool was held at the Royal Institution on Thursday evening, the 16th instant,—

"To consider the proposed compulsory regulations for the keeping, storing and dispensing of poisons."

It was moved by Mr. Abraham, and seconded by Mr. Alfred E. Tanner, that Mr. Edward Davies, F.C.S., take the chair.

The Chairman said he had been invited to preside, not being affected in any way by the question for discussion, and, therefore, unbiassed in his opinions. The meeting, though called by the Council of the Chemists' Association, was not connected therewith, but the resolution would be the voice of the chemists and druggists of Liverpool.

The Secretary read the circular convening the meeting; the proposed compulsory poison regulations; and several letters of apology from those not able to attend, each of which expressed strong protests against legislative interference.

Mr. Redford said that he had taken the course which had resulted in the present meeting being convened from a sense of duty, but he thought it must be a matter of deep regret to all who sympathized with him that they should be compelled to take up a position of seeming opposition to the Council of the Pharmaceutical Society, and to the proposed "poison regulations." He thought this was a false and painful position to be placed in, and he shrank from the unpleasant but pretty certain fate of being misunderstood by the Society, by the public and the Legislature. He therefore felt it necessary to protest against inferences that might possibly be drawn by any parties, that in wishing to make a stand against aggression upon the rights and liberties of the trade, he and those who felt with him were actuated by any feelings of hostility to the Pharmaceutical Society, or were opposed to the voluntary adoption of wise poison regulations. It would be gratuitous to commend the Society, and idle to attack it, as the legal guardian of our trade qualifications, whose *imprimatur* was indispensable to the status of all who should enter the profession. But an attitude of defence now was justifiable, and, he maintained, must be assumed. It was said that ten thousand of the trade were "outsiders," and were unrepresented, and so without voice in the Society's counsels. This large body of Englishmen had feelings, opinions and rights which, if hurt, ignored, or invaded must drive them into a position of defence. The qualifications of the Council for framing "poison regulations," and the weight of their recommendation, were probably indisputable. Perhaps the "regulations" were unexceptionable; without conceding that, however, he thought that was not the question now. He would not dissuade any man from adopting safeguards which commended themselves to that man's judgment, but he contended strongly for freedom. "Let our judgments," he said, "be free and unfettered; throw on us all the responsibility you can heap, and compel us to pass crucial educational tests of the severest examinations of any college in Christendom, but spare us the ignominy of being compelled in addition to adopt artificial material expedients to obtain an imaginary immunity from accidents, which it has been one great aim of our education to secure, and which that education is the only good and safe means of securing."

He said he believed that, as a body, the chemists and druggists of the country did not need this compulsory measure, and that it was impossible to prove the preamble of such an enactment, because, when the vast amount of dispensing done was taken into consideration, the ratio of accidents was infinitesimal. He thought, further, that it would be unconstitutional and essentially tyrannical for the few individuals constituting the Annual Meeting of the Society to coerce and injure, as virtually they would have the power to do, the whole trade; that the policy of compulsion was unworthy of the Society, after the recent legislation on the subject of poisons and educational tests, such a policy being retrograde, tacitly discrediting education, and provocative of ill-feeling, opposition and perhaps schism, and would, if persisted in, result in imperfect and disappointing results. Looking ahead, he must warn them of what they might fairly infer from this attempt in the shape of consequences,—inspection with all its repugnance,—and after that, perhaps, under pressure from the medical officer of the Privy Council, curtailment of other rights.

The absurd exemption from the coercive operation of the proposed "regulations" of doctors' shops and dispensaries was then referred to, and the confusion likely so to arise was pointed out. The formation of a Defence Association he thought most opportune, and deserving of general support, as well as the issue of non-official voting-papers to the whole trade from the *Chemist and Druggist* office, by which he hoped all would express their opinion. He begged to move the following resolution:—

"This meeting, having fully taken into consideration the proposed *compulsory* regulations for the keeping and dispensing of "poisons," strongly protests against such regulations being passed at the Annual Meeting of the Pharmaceutical Society to be held in May next, and further hopes that the members present at the said Annual Meeting will unanimously reject the same."

Mr. Shaw, in seconding the resolution, observed that its construction implied that the meeting had well considered the proposed regulations, otherwise he should have been tempted to dispense with any further argument *pro* or *con.*, seeing that the subject had already been debated almost to the death during the past year. He then briefly alluded to the Pharmacy Bills introduced into Parliament during the last five or six years, calling special attention to the fact of the absence of any stated or implied interference with chemists and druggists in the keeping and dispensing of poisons in the drafts of the Bills submitted to the country in 1867 and 1868, and published in the Pharmaceutical Journal in May, 1867, and in the March and June numbers, 1868. He strongly insisted that there was no evidence before the country at the present time proving the necessity for *legal enforcement* of such regulations, and pointed out the circumstances attending the introduction of the Arsenic Act, the Adulteration of Food and Drink Act, the Petroleum and Nitro-glycerine Acts, in justification of their enactment. Education and a guaranteed competency by means of an examination, combined with personal responsibility, had always been considered the most effective protection against accidents by poisoning; and he considered that such compulsory regulations in the present and prospectively more improved state of education amongst chemists and druggists, were totally uncalled for. He next alluded to the fact that such proposed legislation, applying only to chemists and druggists, was partial, invidious and must prove mischievous by entirely exempting surgeons, apothecaries and veterinary surgeons from its operation, whether occupying private surgeries or keeping open retail shops, as was done in many parts of the country, especially in Glasgow. The public dispensaries were also to be exempted from the observance of the regulations, notwithstanding that upwards of 200,000 packages and bottles of medicine were sent out by the Liverpool dispensaries alone, to the lowest class of the population, during the past year. It had been said that the adoption of the regulations would throw the whole of the dispensing into the hands of chemists. He did not believe that, but thought that, if the surgeons and others were included, it would more probably have that effect. One of the proposed regulations was intended to "educate" the public by means of the sense of touch, as to when a bottle contained poison and when it did not; and he thought that confusion and danger were sure to be the consequence, especially bearing in mind the exemptions already alluded to. Some of the words used in the clauses of the proposed regulations were very ambiguous and indefinite, a circumstance much to be deprecated in any Act of Parliament, more especially where consequences of the most serious character were involved. For instance, the word "poison," of course, embraced all the substances named or implied in Schedule (A), as arsenic, belladonna, strychnia, paregoric and ferrocyanide of potassium, though the latter, according to Fownes, "has no poisonous properties." But the term "poison," in the keeping and dispensing of poisons, could not possibly be restricted to the articles embraced in Schedule (A). The term "ordinary articles" was intended to represent such articles as acetic, citric and tartaric acids, cream of tartar, sugar of milk, magnesia, subchloride of mercury, etc. etc.; but it must not be forgotten that it also included carbolic acid, the corrosive acids, sugar of lead, barytic and cupreous salts, biniodide of mercury,—some of these being most virulent poisons, but not legally requiring any particular regulations as to keeping and dispensing them. The word "dangerous" he looked upon as indefinite and objectionable, from the fact that the Pharmacy Act did not comprehend and define what articles were dangerous, and the Council, with ingenious reticence, did not condescend to point them out. Allusion was then made to the late Jacob Bell, Esq., who commanded the highest respect for his sound business sense, and whose opinion on all matters relating to pharmacy was highly valued. In the year 1857 Mr. Bell said, "The provisions regarding the sale of medicines in square bottles of a particular coloured glass, with the word 'poison' moulded on them, was one of those visionary ideas it was curious to see in print; and he had published the Bill entire" (Sale of Poisons, etc., Bill of that year) "in last month's Journal, as it would be a literary curiosity to be referred to in future." Also, "that no Act of Parliament could make them more careful than they were obliged to be for their own reputation." Mr. Shaw then remarked there was one member of the Council who at present enjoyed a prominent and deservedly popular position in the Society,—he alluded to Mr. Ince; and that gentleman had just communicated his views on this vexed question, and he would beg to read a short letter written to the editor, and inserted in the *Chemist and Druggist*, published the day before.

Mr. Abraham at this point rose and objected to Mr. Shaw reading Mr. Ince's letter, without he also read Mr. Groves' on the other side of the question.

Mr. Shaw said he had not the least objection to Mr. Abraham reading Mr. Groves' letter, if he thought it desirable to do so; but he would content himself by reading that from Mr. Ince.

Suggestions were then made that the pith of Mr. Ince's letter might be given, to which Mr. Shaw replied that the letter was pithy from beginning to end, and that, if he gave the pith, he must give the whole; however, as the time was limited, he contented himself with reading the latter portion of it, and concluded by seconding the resolution.

Mr. Abraham said that he agreed with many of the statements of the preceding speakers, and he had intended to call attention to the fact that the proposition for these regulations was not to be found in any Bill at the time of its introduction by the Council of the Pharmaceutical Society. He himself had no confidence in such provisions in a compulsory sense, and he was not aware that any other member of the Council had. The provisions of the Act were introduced during the passage of the Bill through Parliament, and the discussion upon them would be found in the PHARM. JOURN. 1868–9, pp. 58 *et seq.* It would there be found that the struggle was, not as to the question whether compulsory regulations were to be made,—upon which point both parties in the State appeared to be agreed,—but as to the question who should make them. The present Chancellor of the Exchequer (Mr. Lowe) and the present Home Secretary (Mr. Bruce) were of opinion that the Privy Council should be empowered to make them, but Mr. Headlam said that the noble Duke at the head of the Privy Council (the Duke of Marlborough) had introduced the words "Pharmaceutical Society, with the consent of the Privy Council," as the proper persons, and he supported that view. So also did Lord Robert Montagu and others; Mr. Alderman Lusk saying "that he had no fear of the Pharmaceutical Society not doing their duty." The Act passed, and the Privy Council, possessing a co-ordinate authority, called on the Pharmaceutical Society to make the regulations contemplated by it. Mr. Abraham quoted the speech of the late President of the Pharmaceutical Society, Mr. Sugden Evans, in introducing the recommendations of the Council at the last Annual Meeting, to show that the Council did so as a duty imposed on the Society by Parliament, and not *ex proprio motu.* The meeting referred the propositions back, with instructions to make a further report. Accordingly, the Council having again considered the subject, its propositions will come before the general meeting of the members on the 17th of next month, in Bloomsbury Square. By that meeting, and not by the Council, the matter will be determined, and the question was, what duty, good faith and prudence required them to do. No power existed to take any authoritative vote, except from the members then present. It was not to be assumed, however, that they could have all their own way, and that the matter would end there. He had shown them that both parties in Parliament required regulations to be made, and the Privy Council had, in the letter of January 17th, expressed the opinion that some such regulations were absolutely necessary for the public safety. These being the facts, what would follow the rejection of all regulations? Was it not almost certain that Government would seek new powers, and that another hand than their own would frame the regulations, and seeing how unwilling the Pharmaceutical Society were to adopt them, that their adoption would be enforced by inspection? And who would the inspectors be? The Privy Council was empowered to appoint a visitor to watch the examinations of the Society, and had appointed not a pharmacien, but a medical man. He believed that if all regulations were rejected by the Pharmaceutical Society, the result would be that they would be forced upon them, and that a medical man would be authorized to come behind every one of their counters. On the other hand, what was it they were afraid of? He could not conceive any difficulty in observing the regulations. He observed them himself, but if it could be shown that in any shop in the kingdom they could not be easily observed, they ought not to pass without amendment; and he did think that the regulation with respect to dispensing required amendment. No power but Parliament could authorize inspectors to visit them; if they acted in harmony with the Privy Council, he believed that no attempt would be made to do anything of the sort, but if they set at defiance the expressed wishes of Parliament and of the Privy Council, he had already intimated what he thought would follow. If he thought that there was the least prospect of their being able to influence the Privy Council he would be glad to join in representing the objections which were so strongly entertained.

Mr. CHARLES SYMES, Ph.D., moved an amendment. He said,—Last year I voted against them as a compulsory measure. As being new and untried, we could not tell how they would work; now we have had opportunity for a twelvemonth's trial, and no one who has adopted them unbiassed can say they are impracticable; indeed, it is admitted by all that they are good, but should emanate as a recommendation from the Council and be left for voluntary adoption. For twelve months they have been precisely in this position; and now let me ask, have one-half of the chemists throughout the country given them a trial? Nay, I venture to say, not 50 per cent. have ever read them carefully through, or thought about them other than as an oppressive measure, which, if passed into law, would rob them of their liberty. What then becomes of the voluntary system? Many improvements have been suggested, but all fall short of effectiveness and simplicity compared with the original regulations; to get at any proper idea of the remedy we must first ascertain the cause. You speak of education as the only remedy (no one is a stronger advocate for education than myself); but let me ask you, gentlemen, do not educated men make mistakes? The true cause of 90 per cent. of the accidents (so called) is not ignorance but preoccupation of the mind; the persons who commit them are thinking of something else; and anything which brings a man back to a remembrance of what he is doing must be, to a great extent, an important and effectual remedy. But, gentlemen, this is a question in which principle and honour are involved; it is a fact which it is impossible for any candid man, who would take the trouble to inquire into the matter to deny, that it was part and parcel of our arrangement with the Government at the passing of the Act, that some compulsory regulations should be adopted. We have made a bargain (a bad one, if you like to think it so) as binding as any between man and man; let us then in all fairness as honourable and honest men carry it out. Some jealousy exists on account of the exemption of dispensing medical men. I should be very sorry to associate the dispensing of the surgery with that of the pharmacy; the public know something of the difference even now; but the fact of this law not applying to the surgery, and that medicines and lotions were sent from it in similar bottles, would only serve to make more vivid that line of demarcation which already faintly exists in the public mind and would be of considerable benefit to us. Mr. Symes then moved the following amendment:—"That this meeting approves of the proposed poison regulations as suggested by the Pharmaceutical Council."

Mr. WRIGHT said that for the sake of seeing how many would support it, he would second the amendment, though he should vote against it.

Mr. SUMNER said that whenever this question had been discussed, it was always necessary to fall back upon education, and that was the only safeguard. He did not for one moment suppose that the Government would pass any law making such regulations compulsory; they had altered their opinions since last session, and he thought they would settle this matter much in the same way as they had the control of the railways, and conclude that no man was more competent to take charge of his poisons than the qualified pharmacist himself. It appeared to him that the Pharmaceutical Council thought it better to teach the hand, and leave the head to Act of Parliament for protection, in case of a mistake being made.

The resolution was supported by Messrs. Ball, Jones, Holt, Wright, and was carried by a large majority.

Three votes only were accorded for the amendment.

The SECRETARY was requested to send a copy of the resolution to the President of the Pharmaceutical Society, to be read at the Annual Meeting in May next.

Mr. HAMPSON, of Manchester, who attended as a delegate from the "Chemists' Defence Association," being called upon, urged the importance of united action; invited those present to join the association, and several members were enrolled.

A vote of thanks was unanimously passed to the Chairman and the proceedings terminated.

MEETING OF CHEMISTS AND DRUGGISTS IN LONDON.

A Meeting of Chemists and Druggists, which had been convened by a circular, for the purpose of discussing the proposed Poison Regulations in anticipation of the Annual Meeting of the Pharmaceutical Society, and considering what steps were desirable in reference to them, was held on Monday last, March 20, at the Freemasons' Tavern, Great Queen Street.

On the proposition of Mr. Vizer, seconded by Mr. Bland, the chair was taken by Mr. S. C. Betty.

The Chairman, having read the circular calling the meeting, said the object of the meeting was to consider the compulsory regulations submitted by and through the Pharmaceutical Council, and to determine what action should be taken in reference to them. On previous occasions it had been the salutary custom of the pharmaceutical body to pay all deference to, and acquiesce in any proposals or resolutions emanating from its Council, which had thus been practically acknowledged to be not simply a body of delegates, but of gentlemen elected to sit in council, and to initiate those measures which their professional experience dictated as requisite for promoting the good-working of pharmaceutical institutions; but these sympathizing and co-acting conditions were liable to become developed into mistrust and opposition by what was open to the suspicion of being a foreign element in their governing body. In such a case, questions would arise of vital importance to the well-being of pharmacists, forcing themselves upon their most serious consideration,—such an occasion he believed was the present one. And whilst giving all credit to the Pharmaceutical Council for a desire to do what it considered a duty urged upon it, perhaps by a feeling of conviction, certainly by a chivalrous sentiment of plighted honour, they were fain to raise a wider issue, and now when the Council challenged a verdict, to argue this question, not in the light of a compact to which they were no parties, but as one between chemists and druggists, on whom these compulsory regulations would fall, and the public in whose interests they were proposed. The resolutions offered for acceptance would, from their nature, elicit such practical arguments and illustrations as a knowledge of every-day business would suggest. He would anticipate them but briefly. They might labour at the onset under the disadvantage of appearing to advocate a narrow or a selfish policy. The exhaustive debate that must ensue on this question, would, he doubted not, entirely dispel such a notion. Every speaker would be able to state that he now adopts some plan in the storing of poisons, which, being voluntary, must, in his case, be practical and effective. An argument had been deduced from this practice. It was said that a custom so prevalent must have some merit to recommend it; it was instigated by a motive to do what is morally right, and we cannot logically object to a law that only puts such a moral obligation in a substantive form. But they pleaded to be as diligent in the discharge of their public duties as is any other body in the State; that penal laws should be enacted to meet conditions of a proved necessity; above all, that unless they are consonant with the public feeling of what is right and just, by being indiscriminate in their operation, such laws degenerate into *dilettante* legislation; and, in view of attempts at such legislation, it was their duty to defend, as best they could, the interests and social rights of the trade. Their successors would otherwise censure those who consented to or promoted the Pharmacy Act of 1868, justly upbraiding them that they left this sting coiled up in the provisions of the Bill. At the time of the passing of the Act, chemists and druggists thought, after the numerous hostile motions (and some had no other object than to render its operation impossible, and thus strangle the Bill) had been defeated by formal voting at the time they were proposed, that all the contemplated statute-safeguards which could, consistently with the scope of the Bill, be imposed upon us, had been exhausted: otherwise attempts would have been directed to obtain some mitigation of those cumulative penalties that would attach to other and undefined regulations. They believed the essence and the intention of the Pharmacy Act to be educational; they did not assert that accidents could be wholly avoided solely by a previous technical education, but they did assert that the thorough theoretical and practical training now demanded, begot an intimate acquaintance with the nature of their trade articles, and enabled them, so far as human foresight and intelligence permit, to be the guardians of the public safety. The present law permitted the shirking of no obligation attached to their calling. They invited all aid in recommendations which they might systematize, and they were confident that the discussion and decision of this question would prove how little the Pharmaceutical Society was unmindful of its duty to public demands or to the great body of chemists and druggists.

The first resolution was proposed by Mr. Collins, seconded by Mr. Urwick, "That in the opinion of this meeting the advanced educational qualification of chemists and druggists as provided by the Pharmacy Act of 1868, together with their personal and legal responsibilities, render any 'compulsory' regulations for the storing and dispensing of poisons unnecessary and undesirable and, as a protection to the public, illusory. And this meeting affirms that, whilst it would regard any well-digested 'recommendations' upon the subject with attention and respect, it pledges itself to oppose most strenuously the proposed 'compulsory' regulations of the Pharmaceutical Council."

Mr. J. R. Collins, in presenting the resolution for acceptance, said that it had been most carefully drafted so as to embody objections to compulsory poison regulations which must be patent to all who are engaged in the trade. Time was when the qualifications of chemists and druggists might with justice be challenged; when many, if not most, of those calling themselves chemists knew but little of chemistry, or of the nature and properties of the drugs they were daily compounding. Among such a class of men "regulations" might have been useful; but for thirty years many present, and many now no more, had laboured to improve the technical education of their brethren, till at length, in 1868, what had been voluntary effort was rendered compulsory by the Pharmacy Act, which provided that no person should, for the future, carry on the business of a chemist and druggist without having given evidence of fitness to the satisfaction of competent examiners. Surely this was the best kind of protection, both for themselves and those who employed them. For ill-informed men mechanical contrivances might be necessary, but scarcely for the educated and well-informed. Mind must be superior to matter; and sand-paper, angular bottles, fluted or plain, could not compare as a protection to educated intelligence. To enact that poisons of all kinds should be sent out in particular bottles must end in confusion, as no legislation could prevent these poison bottles from being used for different purposes. The resolution affirmed compulsory regulations to be unnecessary; upon those who affirmed the contrary must the burden of proof rest. Was the Council prepared to say they were necessary? Did not its "Reasons" rather show that it was impelled to take action by the provisions of some "secret treaty" of which they knew nothing, and therefore could not be bound by? They were free to repudiate conditions which had not been communicated to them. The assumption that Clause 1 of the Pharmacy Act committed them to accept compulsory regulations for the "keeping, dispensing and selling poisons" was a delusion; it merely enacted that, should the Pharmaceutical Society think such regulations necessary, the Privy Council was authorized to render such regulations compulsory and legally binding upon all concerned. From the nature of their business they were habitually careful, and needed neither whip nor spur to keep them straight; the liability to compensate the victims of carelessness was a terrible reality, which was always staring them in the face. It was marvellous how seldom mistakes occurred among them, showing how close was the supervision exercised in their vocation. He thought the Council guilty of a moral cowardice in countenancing for a moment the idea that any other safeguard for the public was necessary; and, how much soever they might regret it, they must endeavour to make such an impression upon the Council by the rustication of the advocates of compulsion as would place that body more *en rapport* with the sentiments and interests of its constituents than it appeared to be at present. It was most insulting to them, as educated men, to be told that they could not be trusted to manage the details of their business, and that, in the interests of society, they must be bound by a chain of regulations enforced by penalties; that they should be subjected to inspection, whilst apothecaries, who probably supplied three-fourths of the compounded medicines consumed by the public, were to be let alone, presumably as being more trustworthy than themselves. He emphatically protested against such assertions or assumptions, and without egotism claimed for himself and his craft that they were second to none in the practice of their art. They did not profess to be physiologists, anatomists, or physicians, but as pharmacists they would yield precedence to none. He trusted he had succeeded in establishing the propositions laid down in the resolution; and if so, he would ask most earnestly those present to give effect to their approval by attending the Annual Meeting in May, recording their votes in favour of the foes to compulsion, and most resolutely negativing root and branch the compulsory regulations which were sought to be imposed on them. There were ten thousand chemists and druggists who would be equally affected with themselves by these regulations, but —not possessing the franchise—were unable to protect themselves as they were. As the mover of the resolution in 1868 which reconciled the differences between pharmaceutical chemists and chemists and druggists, and resulted in the Pharmacy Act, he felt specially bound to regard the position of those who had no votes; those who elect the Council should consider themselves as exercising an important trust, and vote only for those candidates who on this question represented their views, and if both town and country were united, they would not fail to set this vexatious question at rest once and for all.

Mr. Urwick, in seconding the resolution, said the regulations were uncalled for, and had never been suggested as necessary. If what Mr. Reynolds had stated was true that some of the articles on the subject were written by members of the Pharmaceutical Council, such conduct was disreputable. Chemists and druggists were qualified by education to conduct their own businesses without the interference of Downing Street. Every person had his own way of conducting his business, and what was safe for one might be unsafe for another. He considered that self-interest was the strongest possible motive for carefulness. The Council in their "Reasons" said that similar precautions to those recommended were probably adopted already, and it was asked why should they be objected to? But he would ask if such were the case, where was the necessity for interference? As to the statement that if adopted they would not be enforced, that was mere child's play. He considered that as a body, they were bound to set their faces against compulsory regulations.

Mr. Page supported the resolution.

Mr. Bland, speaking of the use of particular-shaped bottles, said there was no connection between the shape of such bottles and their contents. They were already used by perfumers and others, and he considered it would be impossible to educate the public to their use.

Mr. Fitch said that a customer coming for a small quantity of laudanum to a chemist and druggist, and being told that he must pay for a poison-bottle, would go to the apothecary where he could get it without such restriction. It had been said that the Pharmacy Act would give them a monopoly of the sale of poisons, but it had not been put in force. He knew of a barber's shop where a large quantity of cantharides was displayed in the window and marked for sale at 6*d.* per ounce.

Mr. Lewis said that he had recently purchased for 2*d.* at an oilshop, an ounce of oxalic acid, which was sold without name or label.

Mr. Vizer wished it to be distinctly understood that the meeting had not been called to load the Council with abuse, but calmly to discuss this very important question. As in days gone by the members of the Society by examination had voluntarily expressed their willingness to give up privileges, which had cost time and money, for the benefit of the trade at large; so now they desired to raise their voices to protect the privileges which they enjoyed for the benefit of future generations. The first words uttered by the President at the last Annual Meeting were to this effect:—"That the avowed objects of the founders of the Society were the amelioration of the condition, and the elevation of the character, of those professing pharmacy; and the means suggested for carrying out these objects were, first, to unite the whole of the chemists and druggists into one body; and, secondly, to organize a system of education, and claim for the qualifications thus obtained certain privileges." It seemed to him another clause might have been well added, viz. having brought the whole body of chemists and druggists under their paternal wing, to strip them of every vestige of self-respect and moral responsibility, and to convert them into mere machines driven by "official" power. They were told by the Council that if they would acquiesce in these regulations "no vexatious proceedings would be adopted to inquire into their observance." If ever a Council betrayed weakness, it had been exhibited in such puerile utterances as these, —to tell us with one breath the resolutions must be absolutely compulsory, and with the next that although compulsory, nobody would desire to ascertain how far they were really carried out. What was that but to hamper and increase risk of accident to those desirous of obeying and faithfully carrying out the law; whilst those who disregarded all precautions now (if such there be) would snap their fingers at these most compulsory regulations, and would go about their daily business unfettered, and far less liable to accident than the man whose mind was full of rules and laws to be observed at his peril? For his own part, if these regulations were forced upon them, he would hold up both hands for their being carried out under the strictest surveillance. The sale of poisons by grocers and oilmen was but an illustration of the point; the first clause of the Act restricted sale of such articles to chemists. Why was it, then, they found them sold without let or hindrance by grocers, but that the Pharmacy Act was not enforced? He considered it the absolute duty of the Pharmaceutical Society to use means for preventing this disregard to law. They were told that should they meet with an accident, the law would regard them tenderly, whilst the utmost rigour of the law would fall upon the disobedient; he presumed, the law considered we paid annually dearly enough by the constant extra anxiety. Again, they were told the public was clamorous for protection. This he distinctly denied as an untruth; that certain medical journals had contained unwarrantable articles he would admit, and considered it most unjust that the Pharmaceutical Journal should reprint such without one word of comment in defence of their interest, but further than the columns of such not one word was heard; and, after an experience of over twenty years, he could positively assert he had hardly once been seriously asked by the public what precautions he used to protect them from danger Mr. Vizer then referred to the answer of Jacob Bell to

Parliamentary Committee, "That he would never put up a fence unless it were strong enough to bear leaning against;" and a remark of Mr. Squire, that it was transferring a man's brains from his head to his fingers. He also alluded to a letter from Mr. Ince in the *Chemist and Druggist*, where it was said,—

"That any pressure from without should admire "and seek to bind on others mechanical substitutes "for intelligence excites no surprise; but that educated "men should endeavour to be chained up as dan-"gerous individuals, and should provide their own "fetters, seems an attitude at once humiliating and "unaccountable."

In the event of the regulations being made compulsory at the Annual Meeting, Mr. Ince suggested the proposal of the following resolution:—

"That our educational system be discontinued, hav-"ing proved ineffective either as regards the training "of pharmacists or the consequent safety of the pub-"lic, and that the commanding premises situate in "Bloomsbury Square be put up to auction."

He concluded by stating that common sense asserted the supremacy of a properly-educated mind stored with real solid acquaintance with the nature and properties of the substances with which it deals, over any mere mechanical arrangements that could by any possibility be devised; and he believed that had the Council met the very first suggestion of Dr. Simon with a straightforward explanation of facts, showing the improving educational status of the chemist, and the increasing desire and willingness on their part to adopt any practical suggestion, the rarity of accidents, and the natural repugnance with which such regulations were viewed by an intelligent body of men, whose qualification their own diploma certified,—had they thus acted the present meeting had never been needed.

The resolution was then put and carried unanimously.

The second resolution was proposed by Mr. Quiller, seconded by Mr. Wade, "That an Association be formed, to be called 'The Metropolitan Chemists' Defence Association,' instituted to protect the London trade from 'compulsory regulations for storing and dispensing of poisons;' and to co-operate with Provincial Associations formed for the same purpose."

Mr. Quiller believed that both the Privy Council and the Pharmaceutical Council meant to do good. But poisoning had not increased lately, and during the last ten years had been extremely rare. Neither was there any popular feeling on the question. He found by reference to the Calendar that already they were subject to eight Acts, and these were enough without any fresh enactments. He referred to a case recently reported in the Pharmaceutical Journal, which he thought would not have occurred previous to the passing of the Pharmacy Act, as no chemist would have ventured to supply so large a quantity of prussic acid to a stranger. But now he had only to produce his book and show that he had complied with the law. The organization proposed was not meant to be a permanent one. He for one would not lend his influence to assist in opposing the Pharmaceutical Society. He had a great respect for it and the Council, and he believed that to them they were much indebted for the position they now enjoyed. But it was simply meant to keep a watch upon this present subject, and he thought they might do good service by uniting together to secure the election of good representative men to sit on the Council.

Mr. Wade, in seconding the resolution, referred to the feeling manifested last year at the Annual Meeting against any such regulations, the wishes of which meeting he said the Council had not carried out. Never was there so strong opinion in the trade upon any question as upon this one throughout the country. Manchester, Norwich, Maidstone, Newcastle, and other places were organizing opposition, and London ought not to be behind. It was not intended to throw any slight upon the Pharmaceutical Society, but to secure the placing of such men upon the Council as would put on one side for ever all such restrictions upon their business.

The resolution was carried unanimously.

The third resolution was proposed by Mr. Patterson, seconded by Mr. D'Aubney, and carried unanimously, "That an Honorary Secretary and Treasurer, an Executive Committee consisting of twelve members of the Association—four to form a quorum,—and a general Committee, with power to add to their number, be appointed."

The fourth resolution was proposed by Mr. Bland, seconded by Mr. King, and carried unanimously, "That Mr. Vizer be appointed Hon. Secretary, Mr. S. C. Betty, Treasurer, and the following gentlemen members of the Executive Committee, Messrs. J. R. Collins, John Wade, W. W. Urwick, J. Beddard, Henry King, J. Bland, W. H. Froom, Geo. Pattison, Thos. D'Aubney, J. Owen, S. Greenish, and C. R. Quiller."

The fifth resolution was proposed by Mr. Lynch, seconded by Mr. Cawdell, and carried unanimously, "That every subscriber of 2*s.* 6*d.* and upwards be a member of this Association.

The sixth resolution was proposed by Mr. Vizer, seconded by Mr. Bland, and carried unanimously, "That the Executive Committee be requested to make choice of such gentlemen as they may consider would represent the correct feeling of the trade and its general requirements. And this meeting pledges itself to support their candidature at the forthcoming election for the Pharmaceutical Council."

Mr. Vizer stated it was very important at all times in electing a new Council to bear in mind that a considerable number of the gentlemen should be resident in London. Through a strange coincidence, the result of the ballot, by which seven old members are annually chosen to remain, had this time not left one London member; and as the greater part of the real business of the Society was conducted at the Committee meetings which met frequently, it was of the utmost consequence that a sufficient number should be elected who were within easy access of Bloomsbury Square. He hoped therefore that members of the Society would not omit to support the gentlemen whose election would be advocated by this Association in concert with Provincial Associations; the list would comprise a due proportion of London and country representatives.

A gentleman present rose and asked why the papers issued by the proprietors of the *Chemist and Druggist*, asking for the opinion of the recipients as to the proposed poison regulations, had been sent to medical men? He thought that it was a question that concerned chemists and druggists alone.

The Chairman said he was authorized to state that such was not the case. The issue had been confined to persons on the Register of Chemists and Druggists.

The gentleman replied that he knew of instances in which they had been received by medical men.

At the close of the meeting, several gentlemen came forward and paid in contributions towards the funds of the proposed organization.

The Bunya-Bunya (*Araucaria Bidwilli*), a native of the northern district of New South Wales, is of considerable interest, as being the only hereditary personal property possessed by the natives, who greedily devour the fruit, either raw, or roasted and made into cakes. This fruit is only plentiful every third year; and at the proper season the aborigines assemble in considerable numbers for the purpose of obtaining it. Each tribe has its own set of trees, and each family its particular individuals among them; and these are handed down from generation to generation. The right of ownership is almost universally respected; but occasional depredations occur, when a fight ensues, the sympathies of the bystanders going with the lawful proprietor.—*Nature.*

The Pharmaceutical Journal.

SATURDAY, MARCH 25, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PROPOSED POISON REGULATIONS.

THE foregoing pages of our present number, together with some reports published in previous numbers, will afford sufficient evidence of a very general response to the circular of the Council calling the serious attention of the members to this question as one demanding early and definite settlement. The Pharmaceutical *vox populi* is at length making itself heard, and we may gather from the resolutions passed at the various meetings, that British pharmacists are to a large extent resolved to oppose the application of compulsory regulations. We consider it unnecessary to enter upon any discussion of the reasons which have been advanced either for this opposition, or in favour of the proposed regulations being adopted, for the arguments, on both sides, have been worn threadbare, and they may be fully studied in our correspondence columns.

But we would especially urge upon our readers the desirability of putting an end to the state of disquiet prevailing in regard to the matter of poison regulations, inasmuch as we consider it is a state fraught with possible danger to the best interests of the craft, one already showing signs of incipient disunion and anarchy.

As regards the action of those concerned, it seems to us the case is very simple, and that much of the argument we have heard is superfluous. The Pharmaceutical Society, having been by law constituted the body to prescribe regulations, with the consent of the Privy Council, it is obviously the duty of its members individually to exercise, at the coming meeting, the power they have of deciding the question, in accordance with the provisions of the Charter. To fail in doing this would, we consider, indicate an inadequate appreciation of the privileges belonging to members of the Society. In like manner we cannot attach much weight to the complaint that a large portion of the trade may be legislated for, and subjected to compulsory regulations by, a body consisting only of a much smaller number, for this complaint is urged with an assumption that the Pharmaceutical Society, as a body, is in favour of the proposed regulations, or that its members will neglect to exercise their power of self-government; while, at the same time, it is still more seriously invalidated by the circumstance that those who complain thus fail to avail themselves of that power to influence the action of the governing body which is open to all registered chemists and druggists. Such reticence, in either case, might well be construed as indicative of indifference to the general interests of the trade, or even as a practical disbelief in the objections to any measure complained of.

We feel the more called upon to dwell on this point since there is one feature of the meetings that have been held which we look upon with much satisfaction, as showing that progress has been made towards the establishment of a creditable *esprit de corps* among all classes of pharmacists. We refer to the almost unanimous expression of respect for the Pharmaceutical Society and for its Council, and to the candid recognition of its good intent and of the service which it has rendered to the trade generally.

Although these meetings have represented a certain degree of antagonism, it has not been of an unwholesome nature, and we have had no exhibitions of stump oratory or abuse, neither has there been any opportunity afforded for parasitic attempts to make trade grievances or difference of opinion amongst members of the trade a battening ground for the promotion of sordid individual interests.

We trust that the good feeling thus manifested will become even still more apparent, and that, by the time when the Annual Meeting takes place, all who take a hearty interest in the question now so prominent, will have resolved to avoid the reproach of unseemly contention—that in place of joining with the medical journals in censure of our Society and its Council, they will devise means of supporting the view they take to be the right one, by a peaceful exercise of their privileges in a way calculated to command respect as well as the confidence of the public in the propriety of British pharmacists being, as a body, entrusted to provide for its safety in regard to the sale, storing and dispensing of poisons or medicines of dangerous potency.

DISPENSING.

WE have much pleasure in drawing the attention of our readers to the remarks upon dispensing, by Mr. W. J. HALLIDAY, in our issue of last week. Our younger friends in particular may peruse some of them with profit, especially those parts drawing their notice to care in dispensing, cleanliness in the matter of labels, bottles, etc., the weighing of powders, and the best mode of proceeding in mixing ointments, essential oils, etc.; but there is a great deal more to be learnt, as the paper explains, than mere manipulation, although dispensing has occasionally been spoken of as a mere mechanical operation. Mr. HALLIDAY points very clearly to the fact that the art of dispensing prescriptions is not born with a youth, and that there is no royal road thereto; on the contrary, that it requires much care, tuition, practice, and discrimination,—that not only the desire, but also the actual opportunity, of practising and perfecting it are necessary. We go further than this, in thinking that, to make a thoroughly good dispenser, it is necessary that he should have some opportunity of seeing, not only how dispensing is practised in different localities, but also the systems adopted at different establishments in the same locality; and here Mr. Halliday's caution to young men not to commence business too soon comes in with good force. But even this is not all, for the mode of prescribing, and the remedies employed, are constantly varying; the formulæ of prescriptions used a quarter of a century ago are nearly obsolete now, and so a similar change may follow in another quarter. Thus, he who was a pupil years ago, finds himself a pupil once more with regard to the material upon which he operates. It is not our intention to specify now these particular substances or forms of medicines; sufficient has been stated to show the kind of training a good dispenser requires, and the material of which he should be made. However, it is not to be expected we can all be A 1 dispensers, neither is it needful that it should be so. But it is desirable that the time should come when all dispensing should be performed by those educated and trained for the purpose; and whether the prescriptions in particular towns or districts be few or many, or not even one a week, taking an extreme case, it is still desirable that the one should be dispensed with as much care —for it may be a most important one—as though there were from ten to twenty per diem. This is only one part of the duties of a pharmaceutist, to this only at present do we desire to point our observations.

We have reserved for the last that portion of our correspondent's communication which is surrounded with the greatest amount of difficulty. Thus far we have sailed with him in still waters. The difficulty is this: how are our apprentices to learn the art and practice of dispensing in those places where there is none to be done, or rather where it is monopolized by the apothecary? Well, we confess this is a very difficult question—almost a poser. Our correspondent offered two suggestions: one, that the Pharmaceutical Society should use its influence to alter the system of dispensing by apothecaries, or, in other words, to obtain the dispensing in its entirety for the chemists. Now, without desiring to throw one drop of cold water upon this suggestion, we think he can scarcely recognize the full difficulty of the task. We conceive that to accomplish this the apothecary must be somewhat raised in his position, so as to be able to live without dispensing, and the public convenience also consulted; in some places, especially poor ones, the inhabitants with large families can hardly do without the apothecary and his annual, ofttimes small and sometimes unpaid account. Our correspondent's second suggestion is that the Manchester Chemists and Druggists' Association should establish a dispensing counter where associates might obtain the required knowledge. We think such a course would not be necessary in London, as pupils attending Bloomsbury Square have already many advantages, and London is, *per se*, the very place where junior assistants of every standard may, if so disposed, find situations to suit them. Help, when required, should be given, and we think freely given, where it can be done advantageously and fairly. We are now entering upon more delicate ground still. The pharmaceutist who takes an apprentice should have within his reach the means of teaching him the business, not the preliminary education,—he should have gained that at school,—but the actual business. There are many things to be taught besides dispensing, and at a very small outlay. Upon a future occasion our attention may be turned in the direction of those other points, and not dispensing. Upon this but a few words more. We have, in our experience, known small establishments where the dispensing formed but a minute portion of the business, and where the opportunities of acquiring practical dispensing knowledge were very limited. The following plan was adopted:—Pharmacopœia pill-masses were dispensed, and the ingredients mixed in small quantities, as if from a prescription, divided, put up and directed in due course, though never sent out; imaginary mixtures and lotions after the same process; plasters were spread upon brown paper, and without shapes. When cold, the plaster was recovered, and worked over and over again, until the tyro could spread a good plaster, with a steady hand and straight eye, without a shape. An intelligent industrious youth with practical business habits, will make himself a good dispenser, but he must be content to become so by degrees. We prefer, as we believe many others do, a *well-trained* country youth, pliable and not wedded to preconceived ideas. Such a junior will, with perseverance and good guidance, make a first-rate assistant, not merely able to dispense, but also to attend to his employer's interests in every department of the *shop* or pharmacy.

PHARMACEUTICAL LEGISLATION IN AMERICA.

In continuation of our *résumé* of the Ontario Pharmacy Bill, we now give the substance of the two clauses relating to the sale of poisons. In a schedule attached to the Act, these are divided into two classes. The first class is subject to precisely the same regulations as apply to the sale of poisons contained in part 1 of Schedule A of the English Pharmacy Act. This class includes hydrocyanic acid, aconite and compounds thereof, tartrate of antimony, arsenic and compounds thereof, corrosive sublimate, digitaline, ergot, Indian hemp, morphia and its salts and solutions, strychnine and nux vomica, savin and preparations, veratria, and oil of cedar. The second class includes those articles which can be sold without restriction by registered druggists, but cannot be sold by any other. They are oxalic acid, belladonna and compounds thereof, Calabar beans, cantharides, chloroform and ether, conium and preparations thereof, croton oil and seeds, cyanide of potassium, euphorbium, elaterium, Goulard's extract, hyoscyamus and preparations, hellebore, iodine, opium and its preparations (not including paregoric), podophyllin, iodide and bromide of potassium, St. Ignatius's bean, santonine, scammony, stramonium and preparations, valerian, verdigris, sulphate of zinc, acetate of lead, and pink root. The Council of the Ontario College of Pharmacy is empowered to add to the number of the above poisons, and from time to time to declare, by resolution, that any other article ought to be deemed a poison within the meaning of the Act. Such resolution, subject to the approval of the Lieutenant-Governor, to take effect one month after it shall have been advertised, together with the Lieutenant-Governor's approval, in the *Ontario Gazette.*

Compounds mentioned in the British Pharmacopœia are to be dispensed according to the formula directed in the latest edition of that work, unless the College of Physicians and Surgeons shall select another standard, or distinct instructions are given to the contrary.

A clause allowing chemists and druggists to sell wines and spirits, and another exempting them from penalties for selling adulterated drugs were struck out while the Bill was in committee.

In various parts of the United States, there is considerable agitation just now in reference to the enactment of laws regulating the practice of pharmacy and the sale of poisons.

We read in a New York contemporary, under the heading "The Murdering Drug Clerks," that a Bill has been introduced into the Legislature for the purpose of shielding the "public from the ignorant drug "clerks, who manage from time to time to kill some "miserable patient of a neighbouring physician by "mistaking a poisonous drug for a gentle physic "powder." The Bill refers only to New York city, and directs the mayor and commonalty to appoint two skilled pharmaceutists, two practical druggists and two regular physicians as an examining board for the examination and licensing of all persons now or hereafter to be employed by any druggist or keeper of drug stores. It enacts that, thirty days after the organization of such board, it shall be illegal to employ any person as a clerk in a drug store who has not passed an examination and received a certificate of competency. It is also made illegal for any other than a prescription-clerk to make up prescriptions. The penalties proposed for the infringement of the provisions of this Bill are a fine of not less than five hundred dollars, or six months' imprisonment, or both, at the discretion of the Court. This Bill, which we are told will undoubtedly become law, does not appear to deal with the qualification of principals, but only of the persons employed by them.

In New Jersey a Bill has been brought forward, which has met with strong opposition on the part of some physicians, from its requiring all to pass an examination who shall hereafter open apothecaries' stores; the physicians claiming that they should be exempt and at liberty to open as many stores as they please.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

March 15th and 17th, 1871.

Present (15th)—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present, on behalf of the Privy Council.

(17th)—Messrs. Allchin, Bird, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Hanbury, Haselden and Ince.

Five candidates presented themselves for the Major Examination and thirty-four for the Minor; the following twenty-four passed, and were declared to be duly qualified to be registered:—

MAJOR (as a Pharmaceutical Chemist).

Scott, Walter ....Elgin.

MINOR (as Chemists and Druggists).

	*Howorth, George Buxton	Chertsey.
	*Hulme, Richard Gleave	Hammersmith.
	*Ground, William Davie	Grantham.
	*Clarke, George Ernest..........	Stowmarket.
	*Hetherington, Martin Luther ..	Highbury.
	Holmes, Nathaniel Wheatcroft ..	Grantham.
	Jaques, William	Beverley.
	Maddison, Henry Gildon	London.
	Hill, William	Louth.
Equal.	Bothamley, Richard Broughton ..	Guildford.
Equal.	Wrighton, Charles Edward	Birmingham.
	Woolley, Harold	Manchester.
	Miller, Nathaniel.............	Preston.
	Guy, Frederick................	Louth.
Equal.	Bird, Matthew Mitchell	Lynn.
Equal.	Constance, Herbert Edward	London.
	Earee, Edwin Thomas..........	Staines.
	White, William Henry	London.
Equal.	Jasper, Frederick William	Penzance.
Equal.	Wilkins, George..............	Stratford-on-Avon.
	Farrow, Charles Henry	Diss.
	Churchman, James	London.
	Pound, Henry William	London.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

Certificates presented by the undermentioned were accepted in lieu of this Examination:—

Beall, Samuel Smart ....Cambridge.
Evans, Thomas ....Salford.
Harrington, Arthur Lewis ......Rochford.
Kingzett, Nathan Izod ....Birmingham.

* Passed with Honours.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A General Meeting of the Association was held on Friday, March 10th; Mr. Stoddart, President in the chair.

The minutes of the previous meeting were read and confirmed.

The President exhibited and handed to the Honorary Secretary for present custody, the Book of Prescriptions, collected by Joseph Ince, Esq., and presented by that gentleman to the Bristol Pharmaceutical Association; and a resolution was immediately adopted requesting the Honorary Secretary to acknowledge its receipt and to convey the best thanks of the Association to Mr. Ince for his handsome and valuable gift.

The subject of the death of the late Dr. Symonds was introduced by Mr. Giles, and the following resolution was unanimously adopted, the members and associates all rising in token of their assent to the expressions of respect it contained. Resolved,—

"That the Bristol Pharmaceutical Association desires to express its sense of the public loss occasioned by the death of the late Dr. Symonds, and particularly to acknowledge the respect and reverence in which his memory is held by the pharmacists of the city in which his long and distinguished professional career was pursued."

It was also resolved,—

"That the Hon. Sec. be requested to communicate the preceding resolution to John Addington Symonds, Esq., accompanied by an expression of respectful sympathy in the personal affliction which has fallen upon himself and his family."

A lecture was then delivered by Mr. Wm. Lant Carpenter, Esq., B.Sc., upon "Respiration Chemically and Physiologically considered." At its conclusion, a cordial vote of thanks to the lecturer was carried by acclamation.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

An unusally well-attended Meeting was held in the Council Room, Mitre Chambers, on Thursday evening, March 16th, to discuss the "poison regulations" question.

The President, who was in the chair, after making a few preliminary remarks, called upon the Secretary (Mr. B. H. Cowgill) to read a short paper he had prepared upon this important subject. He showed at some length how disadvantageous, to by far the greater number of chemists, any such compulsory regulations for the keeping and dispensing of poisons, as those recommended by Mr. Simon, would necessarily become. He did not think that however severe the regulations might be made, they would in any way diminish the number of accidents which occur under the present system; that number being so very small in proportion to the prescriptions dispensed and the amount of business done with those dangerous drugs, the "poisons." He was of opinion that the great responsibility necessarily felt by each individual chemist, and the great precautions taken, as a rule, in the keeping and dispensing of poisons, was of far greater importance and much more weight than anything which would be embodied in any "compulsory measures."

Mr. Clark said he should like to be informed what was the good of all future chemists being obliged to educate themselves to pass examinations, which examinations are considered to be the test as to their capability of becoming chemists, if such regulations as those previously mentioned are to be imposed upon them.

The Secretary was also supported in his views by Mr. Harrison, Mr. Lane, Mr. Yeats and others.

The following resolutions were then put to the meeting and passed unanimously:—

First resolution, moved by Mr. Midgley, seconded by Mr. Yeats.

"That this meeting is of opinion that any compulsory regulations for the keeping and dispensing of poisons are entirely unnecessary, either as a safeguard for the chemist or in the interests of the public."

Second resolution, moved by Mr. Lane, seconded by Mr. Clark.

"That this meeting is of opinion that the standard of efficiency required by the Pharmacy Act, 1868, is a sufficient guarantee as to the fitness of a chemist in the keeping and dispensing of any poisonous drugs required in the transaction of his business.

Third resolution, moved by Mr. Harrison, seconded by Mr. Allcock.

"That this meeting is of opinion that, should any such regulations be enforced, they would be most offensive and objectionable to members of the trade generally."

Fourth resolution, moved by Mr. Lane, seconded by Mr. Midgley.

"That a special fund be raised in connection with this Association, to be called the Defence Fund,—the proceeds of which, after paying any incidental expenses, shall be handed over to the Chemists and Druggists' Defence Association to aid them in their object."

The Secretary proposed, which met with the entire approval of the meeting, "That the above resolutions be formed into a petition and signed by the chemists' assistants of Manchester as an expression of their views upon this subject; that Mr. W. S. Brown be invited to present the same at the Council Meeting of the Pharmaceutical Society."

The proceedings then terminated.

Proceedings of Scientific Societies.

QUEKETT MICROSCOPICAL CLUB.

The Annual Conversazione of this Club took place at University College, on Friday evening, and was very largely attended, as it usually is. The objects provided by the club for the entertainment of its guests, comprised all the optical novelties of the year, and the members as well as the leading opticians did all in their power to exhibit objects worthy of the position the Club claims in the encouragement of microscopical science. Photography was on this, as at the last Annual Soirée, well represented. A large and interesting series of photographs of Indian temples and scenery was kindly lent by the India Office, also frames of photographs were lent by Mr. J. Van Voorst, Mr. John Foster, Mr. E. Kiddle and Mr. A. Shapcott. Mr. Apps exhibited, at frequent intervals, the marvellous electrical effects produced by means of his well-known induction coil.

In the midst of so many attractions it is difficult to single out for especial mention any one feature of interest, but that which seemed possessed, at this time, of surpassing interest was an exhibition on the screen by the oxy-hydrogen light of a series of transparent photographs illustrative of the scenery of the late lamentable Franco-Prussian War, contributed by the London Stereoscopic Company, with an explanatory lecture by Mr. James Martin, and which commanded crowded audiences all the evening.

Obituary.

We regret to have to record the death of Mr. Robert Westwood, of 16, Newgate Street, London, aged seventy-three. Mr. Westwood was one of the founders of the Society, and for the last seven years has been annually elected one of the auditors.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. Robert R. Welborn, Associate of the Pharmaceutical Society, to the office of Dispenser at the Dispensary of the St. George's Union, Mount Street. There were six candidates, amongst whom was a medical officer of the Leeds Dispensary.

VACANCIES.

The office of Dispenser at the Leicester Provident Dispensary. For particulars, see advertisement in last week's Journal.

Compounders of Medicines required for the Convict Service. For particulars, see Advertising Sheet, p. 18.

MEETINGS FOR THE ENSUING WEEK.

MONDAY, March 27. — *Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"On Astronomy." By Mr. R. Proctor.

TUESDAY, March 28. — *Royal Institution*, at 3 P.M.—"The Nutrition of Animals." By Professor Foster.
Royal Medical and Chirurgical Society, at 8.30 P.M.

WEDNESDAY, March 29. — *Society of Arts*, at 8 P.M.—"Woman's Work, with Special Reference to Industrial Employments." By Miss Emily Faithfull.

THURSDAY, March 30. — *Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"Davy's Discoveries in Chemistry." By Prof. Odling.
London Institution, at 7.30 P.M.—"Economic Botany." By Professor Bentley.

FRIDAY, March 31. — *Royal Institution*, at 9 P.M.—"Solar Myths." By Professor Max Müller.

Parliamentary and Law Proceedings.

POISONING BY PRUSSIC ACID.

On Thursday, February 9th, Dr. Lankester held an adjourned inquiry into the death of Mr. Lorenzo Adolphus Staunton, who was discovered, on the morning of his intended marriage, dead from the effects of poison. The deceased was bookkeeper at a mercantile house in Great St. Helen's, and on the evening previous to his death was in good health and in high spirits about his marriage, which was to be celebrated next day. In the morning, breakfast was taken up to his bedroom, according to custom, by the servant, who noticed a bottle beside the bed, since found to contain prussic acid. Shortly afterwards, a jeweller called with some ornaments ordered by the deceased for his bride, and when the servant went upstairs to inform him she discovered that he was dead. The *post-mortem* examination made by Dr. Vans Christian Clarke proved that the cause of death was prussic acid. It was also shown that deceased suffered from a cough, for which he was in the habit of taking diluted prussic acid and ammonia in seltzer water, and also that he was suffering from consumption. The contents of the stomach were analysed by Professor E. Rogers, who stated that it contained prussic acid, and that there was enough to cause death. A letter written by deceased to his mother on the morning of his death, spoke of his joyous anticipation of wedded life. It was also shown that deceased was in the receipt of nearly £400 a year. The jury found that death was caused by an overdose of prussic acid taken by deceased for medicinal purposes, and arose from misadventure.—*Times.*

ATTEMPTED SUICIDE BY CARBOLIC ACID.

At Westminster, on Monday last, Maria Norman, aged fifty, was charged with attempting to commit suicide by taking a large quantity of carbolic acid. It appeared that the prisoner was found on the previous Tuesday insensible. She was conveyed to Westminster Hospital, where she said she had taken some carbolic acid.

Mr. F. Wallace, the house physician at Westminster Hospital, said there were severe excoriations in the mouth, lips and throat of the defendant, produced by carbolic acid. He could not tell how much had been taken, or how much would destroy life, as there was only one instance of suicide by this acid, and that in a lunatic asylum.* He administered olive oil as an aperient and to produce reaction. Carbolic acid was an irritant, not a narcotic, and he had great difficulty to prevent the closing of the windpipe, as it produced great irritation of the mucous membrane. The prisoner had suffered from bronchitis since, but was now out of danger.

The prisoner was remanded for a week.—*Times.*

A CHEMIST FINED FOR SELLING A TOOTH-POWDER WITHOUT A LICENCE.

At Richmond, on Wednesday, the 8th inst., Mr. Lloyd, chemist, was summoned by the Excise authorities, under 42 Geo. III. c. 56, for selling patent medicines without a licence. The defendant admitted the sale, but submitted that the article (a box of "Rowland's Odonto") was not a patent medicine within the meaning of the Act, but a tooth-powder. He was further summoned under 24 & 25 Vict. c. 91, for selling methylated spirits without a licence. He contended that he had a right to sell methylated spirits for mixing with varnish, or for similar purposes. The Bench held that all tooth-powders came within the meaning of the Act as patent medicines, and they fined the defendant in the mitigated penalty of £17. 10*s.*—*Medical Times and Gazette.*

HOUSE OF COMMONS.

WINES IN BOND.—*March 16th.*—Sir J. Lawrence asked the Chancellor of the Exchequer whether the Board of Customs had been authorized to sanction the admixture with wines in bond of tannin, ether and other chemical preparations, provided the owners declared that such a mixture was necessary for fining and flavouring the wines.

The Chancellor of the Exchequer said there was no such authority.

THE METRIC SYSTEM.—*March 21st.*—Mr. J. B. Smith obtained leave to bring in a Bill to establish the metric system of weights and measures. The second reading was fixed for the 18th of April.

ADULTERATION OF FOOD, ETC., BILL.—*March 22nd.*—This Bill was read a second time, with the understanding, suggested by Mr. Muntz, that the discussion upon it should be taken on the motion for going into Committee. That stage was fixed for the 18th of April.

The following journals have been received:—The 'British Medical Journal,' March 18; the 'Medical Times and Gazette,' March 18; the 'Lancet,' March 18; the 'Medical Press and Circular,' March 23; 'Nature,' March 16; the 'Chemical News,' March 17; 'Journal of the Society of Arts,' March 16; 'Gardeners' Chronicle,' March 18; the 'Grocer,' March 18; 'Produce Markets Review,' March 18; the 'English Mechanic,' March 17; the 'American Chemist' for March; the 'Chicago Pharmacist' for February; the 'American Journal of Pharmacy' for March; the 'New York Druggists' Circular' for March; the 'Doctor' for March; the 'Brewer's Guardian,' March 15; the 'Journal of the Royal Institution;' the 'Photographic Journal' for March; Draft of a proposed Law for Regulating the Practice of Pharmacy and the Sale of Poisons in the State of Illinois, from Mr. Ebert; the 'Portsmouth Times,' March 18; the 'Newcastle Evening Telegraph,' March 20.

* See, however, another case, reported *ante*, p. 508.

Correspondence.

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

The Proposed Poison Regulations.

Sir,—It will be a matter much to be deplored if the negligence of a careless few should necessitate the infliction on the careful many of the observance of possibly irksome abstract rules, which, so far from being in their case a *desideratum*, may prove in many instances a positive detriment. No doubt in hundreds and thousands of well-regulated establishments throughout the kingdom the rules that therein obtain—though possibly varying considerably, being adapted to the special requirements of each—are in practice far superior to any fixed rules the Council of the Pharmaceutical Society can frame for the observance of all.

I believe that no code of rules will ever prove a perfect, or, indeed, any material safeguard. Improved education, and firmness in coroners' and common juries, in declaring every man tried by them, in cases of gross carelessness, guilty of manslaughter, are likely to prove infinitely greater safeguards. The laxity of juries in cases such as I refer to, is a great scandal, and fraught with ill consequences. Some few years since a druggist's assistant, while engaged in dispensing a 6-oz. mixture, one of the ingredients of which was Scheele's acid, was called upon to supply an ounce of castor oil in a 6-oz. bottle brought by the customer. He weighed the oil into the bottle into which he had put the *quantum* of prussic acid. The result was that the patient got no acid in his medicine, and the customer who swallowed the oil was killed. And what was the further result? Was the assistant sentenced to six or twelve months' imprisonment, as he ought to have been? Not a bit of it. The trial in some of its incidents resembled that celebrated one of *Bardell* v. *Pickwick*, and proved that fiction to be no exaggeration of actual fact. The counsel for the prisoner deeply sympathized with his "unfortunate" client, who, according to him, ought never to have been placed at that bar; but in his place ought to have stood his employer, who stored prussic acid in such a manner as to render such an accident possible. Having elicited the fact that the castor-oil bottle stood upon a shelf within two yards of the poison (he took no heed of the further fact that the prussic acid was kept in a locked cupboard), he denounced the reckless conduct of the employer in no measured terms, whom, when in the witness-box, he browbeat in a most brutal manner; but he thereby succeeded in securing the acquittal of his client. A slight additional result of his forensic eloquence—to him, doubtless, of no import whatever—was the commercial ruin of the truly unfortunate employer.

It is obvious that the regulations proposed by the Council could not prevent such an accident as the above. What could? Simply sufficient education on the part of the dispenser. Education enough to teach him that the prussic acid was the last instead of the first ingredient that should have been put into the mixture, and sufficient conscientiousness to observe the obligation.

Assuming it to be true that, unless the Council do something in the matter, more rigorous measures will be insisted on by the Medical Department of the Privy Council, the question comes what is best to be done? And when it has been made patent that some druggists are so scandalously reckless, as to keep cyanide of potassium in gallon stone jars, without any label at all being on them; and while, as I happen to know, another is anxious to get into business for himself, who actually is ignorant that muriatic acid is synonymous with hydrochloric acid, one can hardly deny that there is necessity for something to be done. Are the regulations proposed by the Council unexceptionable or desirable? Assuredly not.

Accidents having occurred from the reckless administering of medicines to patients during the night, perhaps in the dark, or when "a light" was burning which only made "darkness visible," it was a sensible suggestion to send out lotions and embrocations, especially when accompanied by draughts or mixtures, in bottles as dissimilar in shape and to the touch, to the bottles which contained the latter as possible. But, unless it is intended to legislate for blind dispensers or for dispensing to be carried on in the dark, I think it would be an absurdity to insist on druggists dispensing any medicines from such bottles, however advisable it may be to dispense some of them into such.

The very regulation must be framed on the belief or supposition that druggists do not infrequently substitute, by mistake, the contents of one bottle for another, when dealing with more or less potent articles, kept in bottles similar to those in which they may keep morphia, ant. pot. tart., strychnine, veratria, etc. And if, unfortunately, this be the case, how much more frequently must it occur with non-poisonous articles, especially liquids,—say, tinct. sennæ for tinct. rhei, tinct. aconiti for tinct. arnicæ, tinct. capsici for tinct. cantharidis, vin. colchici for vin. ipecac., etc.! If such blunders do now occur, they would be likely to be increased fourfold, by a certain number of articles being kept in bottles, "readily distinguishable by touch," by inducing a laxity and carelessness with all others, which otherwise would not be likely to obtain.

The blind and purblind should have no place behind a druggist's counter; all persons there should be especially enjoined to make the utmost use of their eyes,—that those members should not only inform the brain of what is required, but that the brain should, through their medium, direct the hands.

The whole of regulations 2, (A) and (B) as well as (C), would be likely to tend to more blunders than they would prevent. If a goodly number of bottles are to be treated as proposed, they would frequently, especially in establishments where much business is done, be left "untied over," or "uncapped," or "unlocked," or left out of "the cupboard."

Allow me to suggest a much more simple, and likely to prove a more efficacious code of regulations. I would premise that all bottles and even drawers, should as a rule, be kept in alphabetical order. Exceptions, the tinct. opii to be kept in a cupboard with bottles totally dissimilar in size and appearance, or on a shelf with colourless liquids, as spirits or waters, or with dry articles, or with articles for outward application only.

The liq. plumbi bottle not to be placed on the same shelf with liq. plumbi dil. Arsenic, if kept in a drawer, not to be allowed loose in it, but either tied up in paper and labelled, or in a labelled bottle in the drawer, and no other article to be kept in such drawer. If kept in a bottle, not to be allowed to stand on the ordinary shelves, but kept in a cupboard or locker, with bottles and substances totally dissimilar. That strychnia, veratria and atropia be kept in a locked cupboard out of the shop, and set apart for dangerous articles. That certain articles—to be enumerated—be distinctly labelled "Poison," the least potent of them with a black printed label, the more potent with a red printed label, and the most potent ones with a red printed label, with the addition of a death's head and cross bones.

If such simple rules as these I indicate had been universally adopted, I believe scarcely any, if any, of the sad accidents occurring by substituting one article for another would have occurred. "Some distinctive mark indicating that it is poison" is very vague, and scarcely less absurd than the proposition of one of your correspondents who proposed to stick a triangle on poisons, the apex to be up or down (I forget which, and so would many if the proposal were in operation), according to their greater or less potency.

Southampton, 14th March, 1871. Rob. Chipperfield.

Sir,—I have hesitated to add to the extended correspondence with reference to the proposed regulations for keeping and dispensing poisons, but, feeling that it is decidedly unwise to make them compulsory, I am induced to trouble you with this note. Unanimity should be secured if possible. I am sorry to see so much divergence of opinion on this subject, and can only attribute it to want of clear understanding of the necessities of the case. The interests of both sides are really the same, and both, doubtless, are only seeking the best interests of all. I am sure all who are fit to be in the business recognize the absolute need of careful regulations in their establishments. In fact, most of your correspondents seem to think that the proposed regulations are in general use. I hope some united plan of action may be arrived at, and should be glad to see such regulations as may be deemed really necessary issued as recommendations only, backed by all the weight of experience. I feel sure that there would be no further need to attempt compulsion. If, however, there should be any obvious and extensive neglect of wise precaution, then in two or three years the subject can be dealt with.

as may then appear best. Owing principally to the wise action of the Pharmaceutical Society, the condition of things is vastly improved, and progress is by no means stayed. The Council of the Pharmaceutical Society, elected by the free votes of members, are fully qualified to regulate all matters connected with the business, without any interference by outsiders, medical or other.

Education and self-interest are, in my opinion, quite sufficient to lead to the adoption of wise recommendations. But if laws are to be made, they should be absolute, and must affect all alike. It is worse than useless to make laws with no provision for carrying them out. I have been much surprised to see it stated that allusion to dispensaries, etc. is not appropriate here. I presume the safety of the public is the object to be secured. Assuredly, then, wherever poisons are kept and dispensed, the same laws should apply. I was surprised at the character of the remarks quoted from the *British Medical Journal.* There is such an imputation of unworthy motives, and use of threatening language, as is quite unworthy of any honourable journal.

I append my name, as I think it best that the names of your correspondents should be given.

Pendleton, March 15th, 1871. SAMUEL GILL.

Sir,—I believe that poison regulations are certain to be enforced upon us, and that the regulations proposed by the Pharmaceutical Council are such as should be adopted in every well-conducted pharmacy. I do not believe that the better education of chemists is the best security against mistakes: note the strychnine poisoning case at Liverpool and the cyanide of potassium case at Dublin. There was no want of education in either establishment,—might there not have been better regulations?

I hope the Council will succeed in making their proposed regulations compulsory. I am satisfied chemists would feel more secure against the carelessness which it cannot be doubted exists, more or less, where apprentices are employed.

March 16th, 1871. WM. HOUGHTON.

Sir,—I am induced to take up my pen, and reply to the letter signed W. H. P. in your last week's Journal, inasmuch as he makes a statement that might be challenged by hundreds of chemists in the provincial towns. He writes, "All will admit that at the present time more precautions are taken against accidents in the better-class, dispensing businesses." Now I for one do not admit it; and in looking over the record of disasters, *i. e.* mistakes which have occurred during the last twenty years, the greater number will be found to have taken place in the so-called better dispensing businesses, and not in the unfortunate mixed country businesses, where we should be willing to accept 1*s*. 6*d*. for the drops as recipe with which his letter is headed. If we all could find a better-class dispensing business, and get 2*s*. 6*d*. for ℥iij of tr. gent. co., we might then try our hand at country legislation, and suggest a plan for ending the great poison-storing question, especially if a cupboard three feet square would contain all the poisons we required in stock. It is simply nonsense to talk about consigning poisonous acids and alkaloids to a cupboard; and, presuming arsenic would come within this catetory, what kind of a cupboard would be required where half a ton is kept in stock, and must the master always remain at home to unlock this treasury of death? The thing is simply preposterous. Why all this ado about the storing of poisons? Has the business care and vigilance so depreciated, or has the number of poison cases so increased as to call for this change? Why not include guns, pistols, and rope? For there are more deaths from their abuse than all the poisons put together. The sooner this outcry is hushed, and the Council at some different work, the better. We may, I think, safely leave the matter in the hands of individual chemists, for the law and self-interest guard the matter sufficiently.

I am free to confess that I am exceedingly jealous of the Pharmaceutical Council, and it seems clear that unless they are resisted they will throw their silken web around the hundreds of unsuspecting country chemists, and finally bind them hand and foot. Country chemists who are not favoured with better-class dispensing businesses had better look out ere it be too late, and the Council had better look more to the interests of the general trade than try and toady favour with the Privy Council.

Sleaford, March 16th, 1871. GEO. WESTON.

Sir,—Having taken as much interest in trade matters for years past as most of my fraternity, and perhaps more on the poison question, I may venture to express my opinions upon the reasons why the Council have been induced to suggest regulations concerning the keeping and dispensing of poisons after giving them my earnest consideration.

I am quite willing to admit that, by the decision of the members at the last Annual Meeting, the Council was bound to consider the subject, but their decision should have been arrived at by ascertaining the sentiments of those who had sent them to the Board to represent their requirements. The "Reasons" reveal many things not creditable to a body representative of chemists and druggists.

When we read that in 1865, "the Council, encouraged by public opinion (but more especially by the opinion of the medical profession)", it sounds reasonable, as the Council at that time was a select few, representing a small section of the trade intimately associated with the medical profession; but in 1871 the Council, being no longer only the executive of a society, but the governing head and constituted protector of all registered chemists, should receive its encouragement, not from the public, not from the medical authorities, but from its own constituents. When will the Council comprehend that its duties are no longer to legislate so that the Society may be enriched and exalted, but to secure the advancement and benefit of every chemist on the register?

In writing history, even of trade progress, it is well to be accurate; and I endorse Mr. Reynolds's remark, that allusion to the United Society was uncalled for. Before the Bill of the Pharmaceutical Society was made known, that of the United Society had been suggested by our energetic Manchester brethren; and it was the existence of that Bill, even more than the opinion of the medical profession, which compelled the Council to legislate. The promoters of the United Society's Bill have no desire to shirk the responsibility of having defeated the Pharmaceutists' Bill, but rather to take credit for comprehending that Government would not sanction any Pharmacy Act which did not include a Poison Bill also.

Experience at that time had not taught the Council that, although in league with the medical authorities, the outsiders were too strong for it; but this it discovered in the end, and was compelled to accept the tactics of its opponents; and yet it has already forgotten that salutary lesson, and is again attempting to yoke all members of the trade to its restrictions, when all they ask is to be left alone. When defeated it talked of uniting the whole trade, and so accepted the policy of its opponents, by whose efforts we became a corporate body. Yet, no sooner was that happy result of their combination achieved, than, forgetful of its obligations, it returns to its former policy, is influenced by the opinion of the medical profession, and makes tacit understandings with Government medical officers, without considering how far its constituents desire it. It is with much regret that those who laboured hard and long in opposition to the old Council see the reformed government acting in such a manner as to create fresh factions, and give encouragement to agitators and the formation of new societies, when there was an opportunity to cement the whole trade under a liberal and consistent government.

If proper representative men were chosen, we should not behold the lamentable spectacle of a Society divided against itself, but, by judicious conduct, they might bring the whole of the trade to their support.

We want on the Council men who will take a broad and liberal view of all sections,—men, not influenced by the medical profession, but having a clear understanding of what a shop in the country is like as well as a pharmacy in town; who know that the regulations suited for the one would be totally inapplicable to the other, and that—even if suitable to both—interference of any kind would be intolerable.

It is easy enough to classify all under the head of chemist and druggist, but what a diversity of character there is among them! The pharmaceutist in a rich neighbourhood; the prescribing chemist in a poor district; the retail druggist in a mixed locality; large sellers of chemicals; those who include seeds, oils, confectionery, etc.,—all are chemists, but the regulations suitable to one would be utterly impracticable to all the others; and yet we are threatened with compulsory rules for one and all! There is but one remedy. The question at the Annual Meeting must be handed over to the new

Council, and the Society will have the opportunity of placing on the Council fourteen men who will determine not to have our liberties infringed.

March 18th, 1871. JOHN WADE.

Sir,—The question of the proposed new regulations as to poisons has been well discussed in the Journal, but as I felt it my duty strongly to oppose all coercive measures at the meeting of Liverpool chemists on the 16th inst., as one of the founders of the Pharmaceutical Society I wish to give a few reasons for thus differing from the Council.

Firstly.—The Pharmaceutical Society was formed expressly to oppose all compulsory legislation from without. At its formation it completely succeeded in defeating very similar oppressive measures to those now threatened, and up to the passing of the Poisons Bill it effectually protected the trade from this class of legislation. The Poisons Bill was thrust upon it by the non-pharmaceutists, backed by the Government, and now there is strong evidence that the Council is about to leave dependence upon its first principles, viz. improved education and status, with self-control and government, and to adopt or accept a course of obnoxious interference and control, which, however mild at first, will certainly prepare the way for future tyrannical interference, until all self-government is destroyed, and the calling is degraded.

Secondly.—The mechanical arrangement of bottles, and all similar distinctions, as every chemist must know, will utterly fail to add any efficient protection against accidental errors. Before the end of a busy day, or even during a few hours of active and pressing business, any possible arrangement of bottles, caps, or cupboards will be utterly broken into and destroyed, and all safeguards from such a system will entirely break down. Even the poison bottle, when once in the hands of the public, will be used freely for all purposes; servants, nurses, and juniors will be quite accustomed to drink the contents of such bottles, and the poison bottle which came in a few days ago from the chemist with deadly contents will be as much, if not more, likely to be taken in mistake for the vinegar or linseed tea, simply because the shape of the bottles rather than the labels is to be trusted to.

Thirdly.—If some slight protection can be proved to be thus afforded, even this does not justify the infliction of a degrading and insulting system of legislation which will expose chemists, above all other class of men, to pains, penalties and oppression, and make it impossible to conduct the business lawfully. My own business is not so difficult as many, but I have found it impossible in every instance of urgency fully to carry out the present Poison Bill, and the poison book is most obnoxious to many customers; but should any chemist, in any hasty or forgetful moment, send out an article which, from the carelessness of the public, afterwards causes the death of a valuable life, the outraged feelings against him for any trivial omission will know no bounds, and the whole trade may prepare for still further oppressive laws.

Lastly.—Such legislation is un-English, and belongs only to despotic governments. If the Pharmaceutical Council cannot or will not any longer protect us, the chemists of the United Kingdom must and will rise up, and tell the Privy Council and the House of Commons that we are doing all we can to protect life and health, but we will not be hampered and degraded by oppressive enactments. If this is done, there is no fear whatever that the House of Commons will ever attempt such tyranny, while the House of Lords has already decided that the chemist himself must know better how to arrange his bottles than they can tell him.

As one of the founders of the Society I beg a small space in the Journal.

Oxton, 20th March, 1871. JOSEPH BALL.

Sir,—Minute legislation is always burdensome and vexatious, and often futile. We have an illustration of this in the late Cab Act. I was astonished when a cabman placed in my hands a small pamphlet containing a number of regulations he was to observe in his daily avocation. On my remarking the perplexing complexity of these regulations, and asking him what he intended doing, his reply was characteristic, "Take no notice and go on as usual." I fear if pharmaceutical legislation becomes microscopical, we shall have, in sheer self-defence, to "take no notice and go on as usual." It is hard enough to have to carry in our memory the Pharmacopœia without having a cabinet lawyer in addition.

We were told, before the passing of the Poison Act, that our business would be increased at least one-third, but I think the majority of us, if candid, would confess that the reverse is the case. We are now told, if we will suffer a strait-waistcoat to be placed on our internal arrangements and movements, it will not be so in reality. For my part, I believe it will be as stringent as the enforcement of the Poison Act, and ten times more worrying. All legislation ought to be based on broad principles, not minute and tiresome regulations. Whatever regulations are made ought to be within the easy obedience of struggling tradesmen as well as the fops of pharmacy. Take the poison cupboard recommended in the *Lancet*. Many of us could not find room for such an apparatus in our shops if we wished, and the expense of it to some of us would be irksome, nay, impossible. Such complicated gear is likely, by constant working, to get out of order, and while it is being repaired, where are the poisons to be placed? A cupboard is at all times stuffy and inconvenient. Poisons are far better on a shelf by themselves, where they can be plainly seen. As the labelling every poisonous article sold "poison," is considered sufficient for the public safety, surely the same regulation ought to be sufficient for our safety in selling and dispensing. In legislating for us, our legislators must remember we are thinkers and not *automata*.

Bottles of a peculiar form or colour for poisons would be troublesome to the pharmacopolist and burdensome to the public. The word "poison" on any bottle, whatever its shape or colour, ought to be a sufficient safeguard.

I fear this pother about poisons, if carried too far, will lead to a reaction. Wealthy chemists will be having two shops, the poison shop and the safe shop. All diseases, doubtless, can be cured without the use of any poison, and the public will naturally ask, "Why should we take a poison to kill a disease, and thus run the risk of being killed ourselves?"

Were a surgeon to announce that he cured disease without any poison, I have no doubt he would soon obtain a large practice, for the public are becoming uneasy at having to take medicine which requires such careful manipulation, and may, through misadventure, give them their death-blow.

March 21st, 1871. E. K. C.

Sir,—If asked to vote on the poison question, I really could not do so, I should be obliged to remain neutral; such is the position, I am sure, of hundreds besides myself.

If the question were merely the introduction of measures, voluntary or not, conducive to safety, there would be no difficulty in deciding what to do.

The proposed regulations, in themselves, are not so much objected to, from what I can make out of the correspondence on the matter and the opinion of numerous pharmacists (employers and assistants) as to the consequences which would result from their adoption.

The Council of the Pharmaceutical Society should, I think, take chemists generally more into its confidence, and tell them more about the matter than it has. Is it afraid of, or does it despise, the opinions of the many thousands not connected with the Society?

As all chemists really now constitute one body, the body as a whole should be consulted; if it is, all will be knit together in one bond of fellowship, and forgetting bygones, all will work together for good and be one united society.

What will the adoption of the regulations lead to? seems to be the question: to the appointment of inspectors to see that they are carried out, is the reply that comes from most. The Council has not enlightened us on this point. We must not take a leap in the dark. If there are to be inspectors, who will they be? A decided objection is made to the inspecting business, but I do not stick at this myself. Who will the inspectors be? Will the Council appoint them? Many, I dare say, would not object much to have their arrangements overlooked by a brother pharmacist, who, knowing more about the profession or trade, would of course be the best judge of matters and understand any difficulty that may arise; but if medical men are to be the inspectors, I would most decidedly oppose, in every way, the adoption of the regulations at the very outset.

Another objection is that the regulations at present are not intended to apply to other than pharmaceutical and registered chemists. You, Sir, have said that this is no argument against their adoption, and the *Chemist and Druggist* has said that if chemists (proper) adopt them, medical shopkeepers will be left out in the cold. But a friend reminds me that the public may take this sense of the matter: Oh, you see that these men are not to be trusted; the Government is even obliged to make laws to compel them to conduct their business with more care. Go to So-and-so, who is considered properly qualified and competent to prepare medicines without being so looked after. We are told that probably Government will see that the regulations are enforced in all shops or dispensaries, by whoever kept, but of this we wish to be assured.

I have remarked that the Council has not taken care to consult the opinions of the whole body as it should. Although I do not question the result of the Annual Meeting in May next, yet it will be a farce if the voice of the meeting, which is to be held in the small theatre of the Society, is taken as representing that of many thousands who cannot possibly be present at it. The Council should, if it wishes to better the unfortunate position it is in, retrieve its character and fulfil the bright hopes formed of it at the commencement of its term of office, engage a larger room for the meeting, and invite all chemists, whether connected with the Society or not, to attend and express their opinions. This is the more necessary as the Council itself is divided in opinion, and from the fact that two eminent pharmacists, who have just retired from it, express themselves so unequivocally against the adoption of any regulations whatever. The Council would thus in a great measure relieve themselves of the heavy responsibility of allowing regulations to become law without consulting the wishes of chemists generally.

You will gather, Sir, from some of my preceding remarks that I do not object to the regulations themselves, and I would remind those that do, and argue that few mistakes occur, to remember that there are hundreds committed of which we hear nothing. The object of regulations is not only the prevention of fatal mistakes, but the prevention of mistakes of any kind as far as is possible. I am convinced that many are made (it may be by ignorant pharmacists, and there will be none, of course, in a few years) which could be prevented by a few simple rules.

Many already, since the agitation on the subject, have "set their house in order." Laws are not made for good men; regulations are not for those who adopt precautions, but for those who have none and who almost criminally despise all law and order.

With regard to the compulsory adoption of regulations, and the perhaps consequent necessity of seeing that they are enforced, I beg to suggest the following feasible plan, which I have brought forward elsewhere, and which, if carried out, would answer every purpose, and almost do away with the necessity of framing any special regulations:—"To each district let a pharmacist (not a resident in the district) be appointed, who shall inspect the arrangements of every pharmacy in it, and who shall, if he considers that arrangements conducive to safety are carried out, give a certificate signifying that such is the case."

This I firmly believe would satisfy all,—the Privy Council and its medical officer and the public, whose attention has unfortunately been drawn to the matter. Mr. Reynolds' assertion has not been refuted yet.

"When a new pharmacy is opened, the Pharmaceutical Society to be communicated with, and some one appointed to see that suitable arrangements have been made."

Such inspection, or certificate, might last for all time; convenient and proper arrangements once made are not likely to be done away with. But if an inspection took place at stated intervals, say once in five or ten years, no conscientious man, I think, would take it either as a hardship or a troublesome interference.

Should you deem this letter worthy of insertion in the Journal, I may be bold enough to address another to you upon other features in the poison question. E. B.

Sir,—As regulations for the keeping and dispensing of substances, so-called poison, if enforced, must be as simple as possible to ensure their general adoption, let me suggest for consideration whether the following will not meet the case. Let there be no restriction as to shape of bottles, sandpapering, colour of labels or poison closet; but strictly enforce that all vessels containing dangerous remedies be distinguished by a round label (on any ground, gold, or painted any colour, as may suit the taste of the chemist), with "for internal or external use" so expressed above the name; and if for internal use, the minimum and maximum dose expressed below. These labels to be in use for stand vessels.

For dispensing in bulk, the same form of label to be sent out with the necessary directions, and if required, "Poison—care," be printed on the labels in addition to the directions for use.

In the hope that some conclusion may be come to, satisfactory to all parties, I remain, A Founder.

36, *Sloane Square, S.W., March 20th*, 1871.

1. For Outward Application only.
2. Not to be taken Internally.
3. Not for Internal Use.

Sir,—As I expect at our Annual Meeting a precautionary label will be recommended for general adoption for all liniments, etc. containing poison, I beg to state that I consider No. 1 of the above by far the best. Outward remedies are often but partly used, the remainder put aside for another time, and if the word *not* become defaced, the label might lead to the mischief it was intended to avert; but no such result could possibly attend No. 1, which I have used for years and which answers remarkably well.

Thomas Kent.

226, *Blackfriars Road, London, S.E.*
March 21st, 1871.

Poison Bands *v.* Poison Bottles.

Sir,—Of the three clauses (Pharm. Journ., Feb. 11th, 1871, page 653) that are proposed to regulate the safe keeping and dispensing of poisons, the last seems to create by far the greatest opposition.

Every experienced pharmacist knows that neither tri-, quadr-, nor pentangular bottles, blue, "actinic" nor any other coloured glass, rough, smooth nor parti-coloured labels, are of the slightest use in dispensing unless uniformly adopted by each and every member of the whole trade; and consequently no suggestion can ever find favour with all classes, unless it is inexpensive as well as intelligible.

Of the "thousand and one" suggestions that have been made to effect the above purpose, I do not remember one that bears favourable comparison with the simple and inexpensive plan originated by Mr. Jos. Goddard, of this town, viz. that a solution of red sealing-wax in methylated spirit (=the red varnish of the electrician) be painted round the neck and over the stopper's head of the shop or dispensing bottle containing any poison; and for dispensing "external applications" a band of blue paper (about one-third the height of the bottle) be pasted round its lower part, on which band the following label (in black letters on a red ground) should be printed or gummed:—

The Blue paper on this Bottle
is to show that its contents are
NOT TO BE TAKEN.

Specimens of Mr. Goddard's suggestion have for some years been exhibited in the poison bottle section of the Society's Museum.

It is not every one that can find the room, if they can the means, to add a series of poison bottles to the arrangements of the shop; but what druggist is there, worthy the name, who has not an abundance of seidlitz paper in his drawer?

The method suggested in no wise interferes with the usual position of the direction label, nor with the dispatch of business, since it only requires the demand to raise a host of neatly-printed "poison-bands," ready cut and gummed if required. The present difficulty also with which we have to contend, viz. the use of poison bottles by the public for improper purposes, would be avoided, a wash being all that is necessary to convert the dangerous into the usual white or flint-glass bottle.

Finally, this suggestion has the twofold advantage of being, not only "distinguishable to the touch," but appeals at the same time to the sight of the patient, who, with these precautions before him, if he still persists in drinking his liniment, and rubbing in the mixture, stands in need to have his cranium "examined by two duly qualified medical men."

16, *Gallowtree Gate, Leicester*, Jos. Young, P.C.
March 14th, 1871.

Clause 16, Pharmacy Act 1868.

Sir,—If your interpretation, as I understand it, of clause 16 of the Pharmacy Act of 1868 is correct, viz., that neither the widow nor any other unqualified person can legally continue the business of a deceased chemist (even if managed by a properly qualified man) except as a trustee, in which case it can only be for a limited period, I would ask why the Pharmaceutical Council takes no action in the case of co-operative stores retailing and dispensing poisons, where neither trusteeship nor any other qualification obtains?

The case may be put thus, either co-operative stores are illegally constituted, or they are not. If they are, then the Council is bound to prevent any violation of the Pharmacy Act; but if they are not, then the Pharmacy Act is a mere sham, and not worth the paper on which it is printed, since any man or woman, or any association of them, or any relative of a deceased chemist, can keep "open shop for the retailing and dispensing poisons," exactly as the co-operative stores are now doing, *i. e.*, by employing, as dispenser, a registered chemist and druggist.

It seems to me that clauses 1 and 15, taken in conjunction with clause 16, are quite sufficient to prevent any irregular associations from practically evading the law, and I think the Council ought to put in force the powers intrusted to them to this end, or give some valid and sufficient reason for permitting what appears to be, not only a gross violation of the spirit and letter of the Pharmacy Act, but also very damaging to the interests of legally qualified men.

There can be no doubt but that these societies are, in fact, "open shops kept," by certain persons *not on the register*, for the "retailing, dispensing and compounding of poisons," in defiance of the 1st clause of the Act of 1868.

Torquay, March 21st, 1871. EDWARD SMITH.

Dispensing in Surgeries.

Sir,—The instance quoted by Mr. T. C. Jones (in last month's Journal), of a medical man inducing a boy, by the offer of higher salary, to leave his employer is not a solitary one. I experienced the same treatment myself a few months since.

In my case the inexperienced boy was not to take charge of a surgery merely. The medical gentleman (although the place was well supplied with druggists) was starting a regular drug-shop, for the sale and dispensing of the medicines. He has a large out-door practice, and during his necessary absence on his professional rounds this mere boy (who had been with me some twelve months, running messages and occasionally entrusted with the sale of hair oil, logwood and some of the rough drugs) is left in charge of the establishment, and, assisted by a youth of even less experience, compounds the patients' prescriptions, sells patent medicines, and dispenses drugs and poisons to the villagers.

Of course, when a surgeon or doctor keeps open shop his patients have no alternative, but must get their medicines compounded there, be the assistant competent or incompetent. Should a serious mistake ever happen, it will be very difficult to prove that it was not "unfavourable symptoms set in." How different would be the position of the regular druggist under similar circumstances!

Cases of the above kind show the absurdity of imposing restrictions ("for the safety of the public") on a portion of the drug sellers only.

A COUNTRY DRUGGIST.

Bathgate, N.B., February 15th, 1871.

An Advertisement.

Sir,—The fate of a house divided against itself would certainly fall on chemists, if many of them could advertise as follows:—

EASY INSTRUCTIONS FORWARDED TO PREPARE AN ESSENCE OF SARSAPARILLA for 1*s.* pint, equal to that sold at 4*s.* 6*d.* or more. Infallible restorer of Broken-down Health and Blood Purifier. Free for 14 stamps.—REGISTERED CHEMIST.

The Council, I presume, has no power to interfere in such a case, but it is as well the profession should be made aware of this peculiar phase of self-destruction. AVALON.

Adulteration of Food, etc., Bill.

Sir,—As the Bill on the adulteration of food and drugs may probably be passed, it will be advisable that the answers to the following questions be well known:—

Who are eligible for election as analysts?

What person or persons have the power of appointing the analyst?

Are the existing analysts known as the "county" analysts to have the work in this Bill?

May not the examined pharmaceutists compete for the appointment under the Act?

OLD STUDENT.

The Case of Poisoning at Falmouth.

Sir,—In your report of "Suicide by Prussic Acid," in Journal No. 36, date March 4th, Mr. Mitchell is stated to have produced his register signed "Isabella Vaughan (*alias* Mary Pitts)" as the purchaser of the poison. It is not stated who witnessed her signature. Had the Pharmacy Act been complied with in the production of the witness, would the fatal results have followed? Or was the purchaser known to the vendor?

March 8th, 1871. J. BARKER.

Dispensing.

Sir,—I was much pleased to read the paper on "Dispensing" in your last number, and I hope that the subject will often be brought into the columns of your valuable Journal. It is a most important and essential qualification of every young man who is connected with pharmacy. But it does not seem to meet with the attention its importance demands, especially in the matter of apprentices. A great many, after spending a term of several years with a chemist, seem to know comparatively nothing of the practical part of dispensing, and generally have to gain their knowledge in that department from experience in after situations, when they are supposed to be practically acquainted with all the branches of their business. When I left my first master, and went to a situation where dispensing formed a large part of the work, I was at a loss in many respects; and I may say, without exaggeration, that I learnt more practical lessons that would stand by me in after life during my first six months there than I did the whole of my previous term. And this is not a solitary case, but many such could be found daily, and shows a want of attention in this respect on the part of the masters. But it should be a duty incumbent on every master to qualify his apprentice as much for practical dispensing as for the ordinary routine of a chemist's business; and I hope we shall often have a paper or a few suggestions from those who are competent to give them, and they will, I am sure, prove of great benefit, especially to your youthful readers and subscribers.

Allow me, Sir, in conclusion, to say a few words on the almost worn-out "poison" topic. I believe that, to a great extent, the restrictions which many wish to put upon us are unnecessary and superfluous. After the examinations which persons are obliged to pass before they can enter into business, which must ensure a practical knowledge of all articles they have to deal with, every man would take what precautions he thought necessary for preserving his own reputation and the safety of the public. Notwithstanding the stringent rules already adopted, you can scarcely take up a paper but you read some case of poisoning or of suicide. And is the fault the chemists and druggists'? Decidedly not; and nothing that the law can do will effectually remove it. If a man or woman has really made up his or her mind to get a poisonous article they will do so, no matter what burden is laid upon the chemist, and nothing in the shape of coercion or law will do anything to mitigate the evil. It lies with those who wish to procure it; and as long, Sir, as there are people who contemplate self-destruction, or the destruction of others, so long will the evil last.

GEORGE G. JEFFRIES.

51, *Old Market Street, Bristol, March 21st*, 1871.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. Doubell, Mr. J. L. Roberts, Mr. W. B. Orton, Mr. W. W. Stoddart, Mr. C. B. Allen, Mr. C. R. C. Titchborne, Mr. E. Fox, W. H. H., G. W.

WATER ANALYSIS.

THE ESTIMATION OF ORGANIC MATTER AND NITRATES IN POTABLE WATERS.*

BY CHARLES EKIN, F.C.S.,

PRESIDENT OF THE BATH CHEMISTS' ASSOCIATION.

Whilst referring for details to the several memoirs that treat of the subject, I propose to pass briefly in review the various methods now or lately in use for the estimation of organic matter in potable waters, and then to make a few remarks on the value to be attached to the presence of nitric acid.

The old process of incineration, so far as the loss of weight bears any proportion to the amount of organic matter, is now universally discarded, and no doubt rightly so, at the same time one is much helped in forming a judgment of the wholesomeness of a water by heating to redness the residue obtained by evaporation. If it blackens or has a decided empyreumatic odour, there cannot be much doubt as to its character.

The permanganate test, though not by any means to be relied upon by itself, sometimes gives valuable confirmatory evidence. The deoxidation may, however, be due to the presence of a proto-salt of iron or of alkaline nitrites. If the latter, the bleaching takes place in a very few seconds, and it can consequently be at once distinguished and measured separately from the reducing effect occasioned by organic matter, which is always gradual. I find iron to be frequently present in waters which have passed through iron mains, and when we consider also how widely-distributed this metal is, it is manifest that we must be very careful to ascertain its absence before we attribute any bleaching of the permanganate to organic matter. All the strata, and therefore the springs in and about Bath, contain very appreciable quantities of iron; and where this is the case, the permanganate test is almost useless. Yet, notwithstanding this, Dr. Letheby, relying upon this method alone, undertakes to speak authoritatively upon the purity of waters, as in the case of the samples sent up to him by the Bath Corporation a year or two ago.

Frankland and Armstrong's method—although in the hands of such excellent chemists as themselves it may yield good results—is altogether too elaborate and troublesome to come much into use, especially as the alternative process of Wanklyn offers so many advantages. The details of this latter process, which is now generally acknowledged to be the best yet devised, has been so thoroughly explained in Wanklyn and Chapman's little treatise that I need not take up your time by dwelling on it here. Having had a tolerably extensive experience in working it, I can thoroughly indorse all that has been said in its favour as an *improvement* upon the older methods; but I hope the day is not far distant when this even will be replaced by a process yet more satisfactory.

Where sewage is present in a water, it is invariably accompanied by an abnormal quantity of chlorine, but the reverse by no means holds good. I find that the quantity of soluble chlorides varies so much in different strata, that the estimation of chlorine is quite useless as a comparative test between different waters; but it is certainly valuable when it is wished to examine the same water at different times. Thus, the Birmingham water last autumn was regarded with more than suspicion when it was found that the chlorine had increased in it from 1·41 parts in 100,000, in May, to 7·44 parts in 100,000, in August.

Last autumn, too, the Bristol supply, generally so good, was found to be offensive, and to contain a good deal of ammonia, and Mr. Stoddart was requested to investigate the cause. Finding that the quantity of chlorine in the water had not increased above its normal rate, he was enabled at once to say that there was no contamination by sewage; and it was then found that, owing to the lowness of the water, and the exceptional summer, there was present in the reservoir a large accumulation of decomposing diatoms, which had, no doubt, given rise to the impurity.

Of the fermentation test by means of sugar I have had no experience, but I am not sanguine that it will be found of much practical use.

The oxygen of atmospheric air is soluble in water in the proportion of one part to two of nitrogen; and if a less proportion than this is found, it may fairly be concluded that it has been used up in oxidating sewage or other organic matter present in the water.

The estimation of the proportion of oxygen to nitrogen, in conjunction with Wanklyn's plan, seldom leaves any doubt as to the character of a water.

It has always been supposed that, with the exception of the small proportion of nitric acid present in rain water, the nitric acid to be found in spring- and well-waters is to be referred to the oxidation of sewage in some shape or other, but I have ascertained that this is by no means the case. In a paper read before the Chemical Society last month, I showed that the result of several analyses of rocks and fossils collected in this neighbourhood was to prove that they all contained nitric acid in greater or less quantity. Thus, grey chalk marl contained 1·1 part of combined nitrogen in 1,000,000; Bath oolite, 1·3 parts; fossils from the greensand, 2·23 parts; fossils from the lias, 3·6 parts; fossils from the fuller's earth nearly 3 parts, and inferior oolite rock, which is almost entirely made of fossils, 7·6 parts.

Although it is surprising that such soluble salts as nitrates, which probably resulted from the oxidation of organic beings that existed countless ages ago, should still be found in the different strata, it is not entirely without parallel. In one of the very first formations in which evidence of organic life is found, namely, in the Caithness Flags, Sir Roderick Murchison says that the bitumen found there is undoubtedly due to the numerous fishes of the period, and this bitumen, when analysed by Dr. Hofmann, yielded 30 per cent. of organic matter and ammonia. We find, too, from Watts's 'Dictionary of Chemistry,' that such substances as fossil teeth still contain a large proportion of their original organic matter.

Thus Rhinoceros teeth contained .	23·03 per cent.
Elephas primigenius . . .	15·6 ,,
Cave Bear	23·45 ,,
Fish, Acrodus	2·17 ,,
Fish from the Chalk . . .	·54 ,,

If then organic matter even can exist as such, through indefinite time, we shall cease to wonder that salts, the result of the oxidation of organic matter, should also be found.

* This paper was read at a meeting of the Bath Chemists' Association, February 3rd.

The springs rising at the junction of the Great Oolite with the fuller's earth at the north-east side of Hampton Down, contain as much as ·65 grain nitric acid per gallon, and yet the land is never manured, a few sheep only grazing on it, and there is not a house or any drainage near it.

Again, the Monkswood spring, about four miles from Bath, which is going to form part of our new supply, contains as much as 1·28 grains per gallon, but if you will carefully go over the ground for a mile or two all round as I have done (and the spring, from its splendid volume and picturesque surroundings, will well repay a visit), you will fail to find any sufficient source of contamination. The spring, like all those that have percolated through the inferior Oolite, contains more nitrates than those which rise above that stratum, and this is easily to be accounted for, from the stratum being so very fossiliferous.

According to the reports of the Registrar-General, in the *Times*, Professor Frankland regards the amount of nitrates in a water as necessarily the result of the oxidation of sewage matter; and from the nitrates present he actually calculates how great "the previous sewage contamination" has been.

We have seen, however, that nitrates may be present in a water in very appreciable quantities without there having been any sewage contamination at all, and consequently the term "previous sewage contamination" is, to say the least, very misleading.

THE CULTIVATION OF OPIUM IN CHINA.

BY JOHN R. JACKSON, A.L.S.,

CURATOR OF THE MUSEUM, KEW.

It is interesting to note to what extent the cultivation of the poppy for the production of opium varies in different districts of China. From time to time its growth has been forbidden by proclamations from the Emperor, the penalty for growing it being death. Small quantities have been nevertheless constantly grown; for instance, ten years ago all the opium that was produced in Szechuen was grown in small patches of gardens, ostensibly for the amusement of the owners, but specially for the value of the crop. It is a fact that, though the proclamation is still in effect, the executive authorities have found it necessary to take no official cognizance of the existence of the plants; and it is significant of the impotence or the venality of the Chinese authorities, or the discord between the imperial and provincial governments, that the white poppy fields may be seen on the most conspicuous places on the great river route while the cultivation of it is nominally punishable with death. That the cultivation of opium in China is actually increasing cannot be denied, though it is still, in some districts, planted with great secrecy; small patches of land under its cultivation being hidden by fields of tall millet, and when so situated are quite safe from any interference from revenue officers.

Notwithstanding the increase in the production of Chinese opium, and the consequent decrease during the past year or two of the importation into China of the Indian drug, the question still remains whether the native will drive the Indian produce out of the market, or depress the latter so much as to seriously affect its importation and price. In point of strength or flavour the Indian is far superior to the Chinese, the latter averaging 40 per cent. less in price. It is its cheapness that is one of its chief recommendations in the Chinese market, and, being purchased at such a reduced price, it is often mixed with the Indian drug.

With regard to the conditions under which Indian opium now enters the Chinese market, the following notes contained in a recent report on the subject will better explain them than any words of our own:—

"Malwa opium is cultivated by native growers in the province of Malwa and the adjacent and central provinces of India,—the land upon which the crops are grown paying to the Government the customary ground-rent. The farmers, upon gathering in their crops, offer the juice of the poppy daily upon the nearest country markets, and it is there purchased by other natives (who may be denominated packers), who, in their turn, pack the drug in balls, and thus prepare it for transmission to Bombay. These packers then sell the opium, thus prepared, to other native merchants, who purchase it especially for sale upon the market of Bombay, where exporting and foreign merchants buy it for shipment to China, etc. The importing Bombay merchant, before attempting to take the drug to Bombay from the hand of the packer, has first to procure a pass from the Government treasury, costing 600 rupees per chest, which pass frees the opium from further taxation *in transitu*, certifying that the drug has paid its duty. Upon reaching the market in Bombay, as aforesaid, it is purchased by the exporting merchants, who, before operating, naturally base their calculations on the China demand and quotations; and thus the market in Bombay, and necessarily throughout the producing districts, is governed by the market of China. The quantity placed under cultivation by the growers is also almost entirely dependent upon the demand, both of the present as well as of the preceding season; and thus the crops usually range from 35,000 to 50,000 chests per annum. No opium is allowed by the English Government to be reimported into India. It may be as well here to state that, during the past three or four years, the demand for China having decreased, the cultivation in India has been lessened in like degree.

"Of the Bengal drug there are two descriptions,—one, called Patna (produced in the province of Behar), and the other Benares, from the province of that name, where it is grown. Both descriptions are cultivated entirely by the Government itself, which employs men for the special purpose of cultivating the poppy, collecting the juice, inspecting and packing it into balls. The drug is supposed to cost the Government, laid down in Calcutta, 400 rupees per chest. On arrival of the drug into the Government godowns at Calcutta, it is sold by public auction, in lots of five chests, to the highest bidder. On the fall of the hammer, the buyer has always the option of there and then securing as many succeeding lots as he wishes at the same rate as the lot he has just bought. The purchaser of any parcels has to pay, on the fall of the hammer, bargain money at the rate of Rs. 50.100 per chest, and the balance of purchase money within a fortnight. It is not compulsory, however, to take immediate delivery of the opium, as the Government allow it to remain, free of warehouse charge, for an indefinite period.

"These auctions take place once every month, a limit of 400 rupees per chest being placed on the drug; therefore, all it realizes over and above this price goes towards increasing the revenue, and is a profit to the Government. The crop is apportioned in equal quantities to each month for public competition, and its extent is, in a great measure, regulated by the demand, as in the case of Malwa. No private individuals are allowed to store opium in these godowns; all so found is looked upon as smuggled, and confiscated. When a buyer wishes to export his purchases, they are shipped for him by the Government agent, and delivery cannot be taken in Calcutta."

About fifty years ago, when Patna opium had been introduced and had made some way in Szechuen and the neighbouring provinces, it fetched double its weight in silver, and the people smoked it cut in slices and rolled up in paper like a cigar. At the present time there seems little doubt but that its consumption is increasing rapidly, more especially among the labouring classes. It is said that already eight men out of every ten smoke it, and quite one-half of the women. Irrespective of the moral bearings of the subject, there can be no doubt that if a general and open system of poppy cultivation were allowed in China, it would become a highly remunerative branch of agriculture.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Ferri Oxidum Magneticum.—[§ Magnetic oxide of iron, Fe_3O_4, combined with about 20 per cent. of water of hydration and containing some peroxide of iron.]

Sulphate of iron is dissolved in water and mixed with solution of persulphate of iron [free from nitric acid] and the mixture is precipitated, boiling, by solution of soda. The precipitate, at first brown, becomes black on standing, and is collected, washed thoroughly and dried at a gentle heat.

The iron salts must be employed in such proportion as to contain one atom of iron in the ferrous state, and two atoms in the ferric state. Thus, if solution of persulphate of iron be not ready, a quantity of sulphate may be divided into three equal parts, and two of them boiled with sufficient sulphuric and nitric acids to convert them into ferric salt. Excess of nitric acid must be driven off by evaporation.

The reaction is as follows:—

$$\left.\begin{matrix} FeSO_4 + 2NaHO \\ Fe_23SO_4 + 6NaHO \end{matrix}\right\} = \left\{\begin{matrix} Fe2HO + Na_2SO_4 \\ Fe_26HO + 3Na_2SO_4 \end{matrix}\right.$$
$$= Fe_3O_4 + 4H_2O + 4Na_2SO_4.$$

This compound may be regarded as a kind of salt in which the iron fulfils both the basylous and acidulous function $Fe''(Fe'''_2O_4)$. This view of its constitution is countenanced by the fact that ferric hydrate acts towards metallic iron as an acid; freshly prepared and boiled with iron filings, it evolves hydrogen and gives rise to the production of magnetic oxide:—

Ferrous oxide	FeO
Ferric oxide	Fe_2O_3
Ferrous ferrite	Fe_3O_4

Magnetic oxide of iron is an important and abundant ore of iron; it forms the *loadstone.*

The magnetic oxide of iron, dissolved in acids, forms solutions which give the reactions both of a ferrous and of a ferric salt. Thus a dark blue precipitate forms with yellow as well as with the red prussiate of potash. The latter is Turnbull's blue (see Ferri Iodidum); the former is Prussian blue, a ferric ferrocyanide:—

$$2(Fe_2Cl_6) + 3(K_4FeCy_6)$$
$$= 12KCl + Fe_4(FeCy_6)_3.$$

[§ Two grams dissolved in hydrochloric acid continue to give a blue precipitate with the red prussiate of potash until 8·3 c. c. of the volumetric solution of bichromate of potash have been added.] This amount corresponds to very nearly 9, or more precisely 8·965 per cent., of ferrous oxide. The calculation is precisely similar to that explained under ferri carb. sacch.:—

$$20000 : 8{\cdot}3 :: \overset{6FeO.}{=432} : {\cdot}1793$$
$$\text{and } 2 : 100 :: {\cdot}1793 : 8{\cdot}965.$$

PHARMACY IN PARIS DURING THE INSURRECTION.

The advantages possessed by iron revolving shutters have generally been admitted, but few, I think, ever found them more useful than did the shopkeepers and pharmacists in the neighbourhood of the Place Vendôme on Wednesday last. Since the horrors of the siege, Paris had been gradually sliding into the old grooves; strangers reappeared, letters and telegrams seemed no longer a strange and new pleasure, and commerce had reinstated herself. It was unfortunately but the lull before the storm. Three days before, the Place Vendôme had been occupied by the insurgent battalions of the National Guard, the pretending friends of order, who, at the approach of a peaceful unarmed deputation headed by the journalist Henri de Pène, discharged more than 500 shots into the crowd, killing over twenty and wounding about sixty persons. In an instant the pavement was red with blood, and the dead and dying were carried into the neighbouring pharmacies, to receive what attentions could be given to them, awaiting the arrival of the surgeons. Ambulance stretchers were soon procured, and mournful processions, headed by men bearing large white flags with the Geneva cross, traversed the streets of Paris, exciting the hate and loathing with which all orderly citizens regard the resumption of a new reign of terror at the hands of the Belleville insurgents. All business, excepting the mournful duty of stanching death-wounds, is over for the present in this usually gay quarter of Paris. Half-a-dozen blood-stained mattresses piled in a corner of nearly every pharmacy tell their own sad tale, and the once white marble floors are variegated and slippery as the pavement of the Piazza San Marco, at Venice, on a rainy day. All the shops are closed, and peremptory commands to shut all windows fronting the street are issued in loud tones, accompanied by menaces from loaded chassepots. In comparison with this, the siege was quite enviable; then, at all events, shops were open, and one could walk about the central parts of the city in perfect safety.

And then a certain amount of business was done,—business of the pathetic kind. Wives, sisters and sweethearts came and bought pocket pharmacies, little stocks of lint and plaster, perchloride of iron, etc. for their dear friends about to start for the fields of battle. Many a tear was shed over the purchase, many a wish uttered that those dear to them should never require the sad appliances of modern civilization to heal the wounds caused by the destructive engines of modern barbarity. Alas! how many hopes have been scattered to the wind! How many pale, weeping figures, clothed in black, are daily to be seen carrying in pious hands wreaths of "immortelles," to deck the rude crosses that lie thick at Montretout and for miles around. The past was dreadful enough, gilded over by a coating of patriotism; the present is doubly fearful,—brother against brother, and no canopy of glory, but one reeking shroud of vengeance, hatred and bloodshed.

The siege, by provoking the appetite, instigated curious researches among the edibles generally found in pharmacies. As long as a few tins of concentrated milk remained, we fared luxuriously on arrowroot puddings and oatmeal gruel; in fact, a tolerable pharmaceutical dinner, save the monotony, was daily procurable, and consisted of a soup of Liebig's extract, thickened with tapioca or pearl-barley. A *hors d'œuvre* of anchovy-paste or olives; then a *pièce de résistance*, such as curried horseflesh, or a cat's thigh strong with garlic, a salad of mustard and young flax, which we grew in boxes in the cellars, a dessert of Jordan almonds and conserve of hips, and a strong cup of coffee with which to wash all down. When the bread became almost uneatable, Hard's food was brought into requisition,—the dough was cleanly made in a large pestle and mortar, with a due proportion of bicarbonate of soda and hydrochloric acid, and baked into light little loaves, or rather cakes, of surpassing delicacy of flavour. Our distaste for horseflesh induced us to invent sundry *bouquets*, the success of which was so great in imparting a really pleasant flavour to the insipid meat, that I am sure no *cordon bleu* should ignore their utility. The favourite consisted of a clove of garlic and a pinch of peppercorns, corianders, cloves, parsley-seed, dried thyme and ginger, bruised together and tied in a piece of muslin.

The only article for which an extraordinary demand existed was extract of meat. Tonics were much taken, and resulted in several new specialities, rather more ingenious than tasty, such as a combined essence of calisaya and Liebig prepared with Cognac!

ERNEST J. T. AGNEW.

232, *Rue de Rivoli, March 22nd*, 1871.

HERMODACTYLS.

BY M. C. COOKE, M.A.

It might be supposed that all had been written and said about hermodactyls that could be said, and that the subject had been settled for ever. Such was my own impression until lately, when the notion entered my head that the microscope might reveal something more, and this appeal to the microscope has unsettled the question again. Hermodactyls are eminently starchy products, and, should it be found that there is any peculiarity about the starch granule sufficiently positive to throw doubt upon the generally accepted notions regarding hermodactyls, then it needs no apology to reopen the subject.

The conclusion which seems to be accepted is, that hermodactyls consist of the corms of one or more species of *Colchicum*, one of them being *Colchicum variegatum*. On referring to Pereira we find two kinds of hermodactyls described from specimens communicated by the late Dr. Royle, one of these being the tasteless hermodactyl and the other the bitter hermodactyl. The opinion which seems to have prevailed has been that these are only forms or conditions of the same drug; and that they are two quite distinct sorts of hermodactyls produced by very different plants has never been supposed. That such, however, really is the case is the object of this communication.

In order that the subject may be fairly before us, we give the characters from Pereira:—

1. "TASTELESS HERMODACTYL; *Soorinjan Sheeran* (*i. e.* sweet sorinjan), Royle.—In their general form these cormi resemble those of *Colchicum autumnale.* They are flattened, cordate, hollowed out or grooved on one side, convex on the other. At their lower part (forming the base of the heart) is a mark or disk for the insertion of the root fibres. Their size varies; the specimens I have examined were from $\frac{3}{4}$ to $1\frac{1}{2}$ inches in length or height, 1 to $1\frac{1}{2}$ inches in breadth, and about $\frac{1}{2}$ an inch in depth. They have been deprived of their coats, are externally dirty yellow or brownish, internally white, easily broken, farinaceous, opaque, odourless, tasteless or nearly so, and worm-eaten. They agree precisely with hermodactyls furnished me by Professor Guibourt. They are readily distinguished from the cormi of *Colchicum autumnale* by the following characters, which are correctly stated by Geoffroy:—They are not rugose, are white internally, are moderately hard, easily broken, and form a whitish powder; whereas the dried cormi of *Colchicum autumnale* are rugose, softer, and have a reddish or greyish tint both internally and externally."

This is an accurate description of the tasteless hermodactyls, the starch granules of which are very much like, almost identical with, those of *Colchicum autumnale;* that is, the granules are compound, either binate or trinate, two or three granules being fused together into one mass of an elliptical or triangular, and rarely when four are united, into a quadrangular form. It is not at all uncommon to find mixed up with these corms in the bazaars of India Singhara nuts (*Trapa bispinosa*), which are very similar in size and form, but more distinctly triangular. The starch of these is simple, with a distinct crack or fissure in the centre.

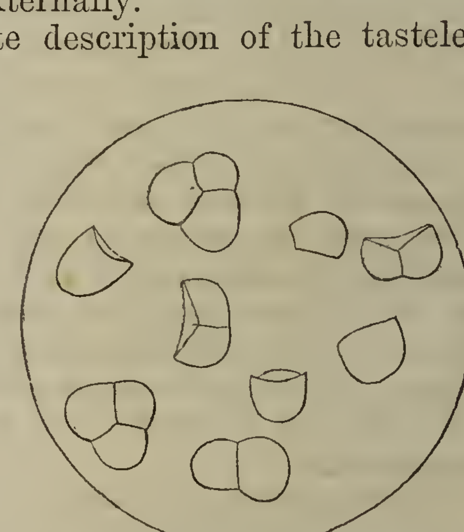

Fig. 1.—Starch-granules of the Tasteless Hermodactyls.

2. "BITTER HERMODACTYLS; *Soorinjan tulkh* (*i. e.* bitter sorinjan), Royle.—The cormi of this variety are distinguished from the preceding by their bitter

taste, their smaller size, and by having externally a striped or reticulated appearance. Their colour for the most part is darker; in some specimens it is blackish. One cormus is ovate cordate; 1 inch in height or length, ¾ of an inch broad, and about ¼ of an inch thick, grooved or hollowed on one side, convex on the other; of a brownish yellow colour, semi-transparent, has a horny appearance, and is marked by longitudinal stripes, indicating a laminated structure. A second is opaque, amylaceous, reticulated externally, white internally, less flattened, and of a remarkable shape, the concave or hollow side of the cormus being continued half an inch below the mark for the attachment of the root fibres. The other cormi are of the size and shape of a large orange-pip, but flattened or grooved on one side; some of them are worm-eaten, and one is blackish-brown externally."

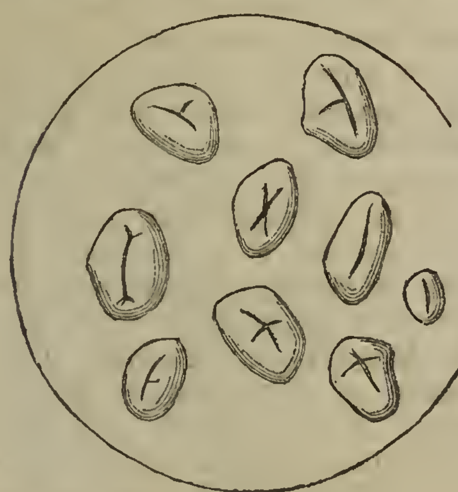

Fig. 2.—Starch-granules of *Trapa bispinosa.*

Whatever these specimens may have been, the description does not agree with the Soorinjan tulkh received from Bombay: the corms are larger than those of Soorinjan shereen, are split, and laid open, yellowish, more horny, quite bitter to the taste, and the starch is simple, elliptical or oblong, sometimes ovate, and nearly of the same size as the granules of *Trapa bispinosa*, but there is no indication of hilum, crack, or fissure of any kind. The starch does not therefore bear the slightest resemblance to that of *Colchicum autumnale*, or that of the tasteless hermodactyls, so that, although I have not the slightest doubt that the tasteless hermodactyls are correctly referred to a species of *Colchicum*, and probably *Colchicum variegatum*, I do not believe that the Soorinjan tulkh of the bazaars of Bombay are the produce of a species of *Colchicum* at all. It is clear that they are entirely distinct from Soorinjan shereen.

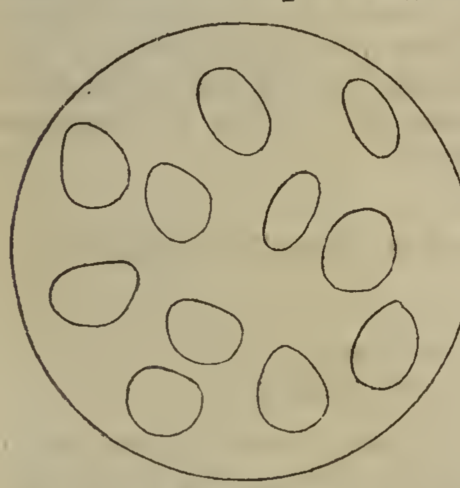

Fig. 3.—Starch-granules of the Bitter Hermodactyls.

I have no doubt whatever that there are two definite vegetable products known in India under the name of hermodactyls, and that they are the produce of very different plants and should be treated as distinct drugs. The character of the starch is quite sufficient to justify this conclusion. At present I am without any evidence as to the place of production, or the plant which yields the Soorinjan tulkh, but it is probably the most active drug of the two, since the tasteless hermodactyls seem to be about as starchy, tasteless, and inert, as fragments of dried potato. From the figures above given it will be observed that the starch of the bitter hermodactyls is nearly of the same size as in the Singhara nuts, but without the characteristic fissure; and that the starch of the tasteless hermodactyls is nearly identical with that of *Colchicum autumnale*. These facts, revealed by the microscope, again partly revive the question, "What are hermodactyls?" or, at least, if we assume that the source of tasteless hermodactyls is settled, the inquiry assumes the more definite shape, "What is the source of bitter hermodactyls?"

THE DIGESTIVE POWER OF COMMERCIAL PEPSINS.

BY J. S. HAWLEY, M.D.

The following remarks upon an article entitled "Liquid Pepsin and Saccharated Pepsin," which has been reprinted in this Journal* from the *American Journal of Pharmacy*, appear in the March number of that journal:—

In a recent number of your journal an article appeared by E. Scheffer, of Louisville, Ky., which not only impeaches my veracity, but is likely to do me serious harm pecuniarily.

This article contains an account of an experiment to test the digestive power of several varieties of pepsin, among others one made by the author of the article and one made by myself.

Of Mr. Scheffer's pepsin I have no knowledge, and am not disposed at present to question his statements concerning it. But in respect to the other varieties, I have made frequent tests of their strength, some of which I have published. To vindicate the truth of my statements I have performed a digestive test, following the method pursued by Mr. Scheffer, and will thank you to do me the justice to give it a place in your journal. In doing this, I wish it to be understood that no unfavourable reflections are intended towards Mr. Scheffer. On the contrary, his article bears intrinsic evidence of candour and scientific accuracy. It is my belief that he unfortunately procured a damaged sample of my pepsin, as he admits he did of Boudault's on a former occasion.

My only object in this communication is to set myself right before the professions of medicine and pharmacy.

In this test the same varieties of pepsin are used, and the same method pursued, as by Mr. Scheffer, except drying the residue, which has been done to secure greater accuracy of result.

In each of four suitable bottles were placed sixty grains of coagulated albumen (white of egg), one fluid ounce of water, five drops of muriatic acid, and five grains of Boudault's, Grimault's, Houghton's, and Hawley's pepsin respectively.

These were kept in the same water-bath, at a temperature of 98° to 102° F., and frequently agitated during the space of four hours. At the end of this time the undigested portions were removed and drained of moisture.

The following appearances were presented by the residua respectively:—

That digested in Houghton's pepsin appeared unaltered in form, colour and quantity, and soon became dry as before digestion.

That digested in Grimault's had lost something of its opacity, the angles were rounded, the quantity sensibly diminished, and presented an appearance of increased softness and moisture.

That digested in Boudault's possessed a slightly translucent appearance, the angles of the remaining pieces entirely destroyed and the quantity decidedly diminished, wet and inclined to remain so.

That digested in Hawley's pepsin had become nearly translucent and amorphous, the quantity much more diminished than the last and very wet, evidently considerable peptone adhering to the undigested portion.

These residua, together with sixty grains of coagulated albumen, which had been subjected to no diges-

* Pharm. Journ. *ante*, p. 666.

tion, were placed separately upon clean earthen plates and desiccated to dryness.

This desiccation was employed to avoid the difference of weight due to the difference of capacity for retaining water possessed by substances in different stages of digestion.

After complete desiccation, the residua weighed as follows:—

The albumen which had undergone no digestion weighed	$7\frac{1}{2}$ grs.
That digested in Houghton's	$7\frac{1}{2}$ "
" Grimault's	5 "
" Boudault's	2 "
" Hawley's	1 "

Now, since it appears that one grain of dry is equal to eight grains of fresh coagulated albumen, it follows that—

Houghton's pepsin is entirely negative or digested nothing.	
Grimault's digested	20 grs.
Boudault's "	44 "
Hawley's "	52 "
One grain of Grimault's pepsin digested	4 grs.
" Boudault's "	$8\frac{4}{5}$ "
" Hawley's "	$10\frac{2}{5}$ "
Grimault's digested of the albumen	$\frac{24}{60}$ "
Boudault's "	$\frac{44}{60}$ "
Hawley's "	$\frac{52}{60}$ "

This last comparison between Boudault's and Hawley's pepsin agrees, within a very small fraction, with my digestive test upon fresh beef, made more than a year ago, and published in my circular. This circumstance is somewhat corroborative of the correctness of both tests.

PHARMACEUTIC NOTES.

BY C. LEWIS DIEHL.

Blue Pill is one of the simple preparations of our Pharmacopœia that is seldom prepared by the apothecary; in fact, its preparation is the exception and its purchase appears to be the rule. There are numerous reasons why it is not generally prepared by dispensers, first and foremost among which may be mentioned the labour attending the extinguishment of mercury. Quite a number of processes for facilitating this have been from time to time recommended, but none seemed to me so simple as one recommended some time ago by a writer in one of our pharmaceutic journals, which consists in agitating the mercury with a small proportion of tincture of tolu, and then incorporating it with the proper ingredients. Another reason appears to be that blue-mass, when made strictly according to the Pharmacopœia, soon becomes hard and unmanageable. Manufacturers, taking advantage of this, aim to produce a blue-mass which, while corresponding in mercurial strength to the officinal article, will retain its plastic condition, and thus they create a demand for their particular manufacture.

While engaged in the manufacture of blue-mass on a considerable scale, I soon found it necessary to change the ingredients in order to obtain a more plastic mass, and succeeded very well, with but one objection, namely, that the mass was liable to become somewhat tough, and consequently more or less difficult to roll out. In other respects the mass left nothing to be desired. By experiments lately made, I believe to have overcome this difficulty; but I cannot say as yet that my experiments with tincture of tolu warrant the assertion that it affords a rapid and convenient medium for extinguishing mercury, without the application of more manual labour than is likely to be bestowed upon the object.

When one ounce of mercury is briskly agitated with half a fluid drachm of tincture of tolu, contained in a two-ounce vial, it soon becomes divided into globules, and in perhaps one or two minutes these globules will be scarcely visible, as such, to the naked eye. Occasional brisk agitation for twenty to thirty minutes, however, is necessary to so far extinguish the mercury as to render globules invisible through a lens of moderate power. After the mercury is so far extinguished, it would appear an easy matter to mix it with syrup, honey or any other desirable fluid that, in the manufacture of blue-mass on a large scale, is employed as an extinguishing medium; but this I have found not to be the case, for when the mixture is stirred into the remaining ingredients for blue-mass, globules of mercury abundantly form, and delay the completion of the process considerably. This is probably owing to the action of the syrup or honey, etc. upon the tolu coatings of the minutely-divided mercury, by which a portion of mercurial surface becomes exposed, and unites with another in a similar condition.

However, something is gained by the use of tincture of tolu, for I have prepared blue-mass in less than an hour,—twenty to thirty minutes of which being consumed in briskly rubbing the mixture to entirely remove globular mercury.

If it were practicable to keep blue-mass in the form of three-grain pills, as provided by the formula of our Pharmacopœia, there would be no necessity for a change in its ingredients. This not being the case, the formula should be so altered as to ensure a mass that will keep its soft consistence for a reasonable period. It may be contended that the ingredients entering its composition are necessary to its remedial properties, for some authorities maintain that blue-mass owes its virtues to the metal in an oxidized condition, and the question may then arise, "*Do the ingredients of the officinal blue-mass specifically tend to promote this oxidation?*" It is reasonable to suppose that such is not the case, for otherwise much of the blue-mass of commerce, in every other respect properly prepared, would be found ineffective. I venture to doubt that either powdered liquorice root or the components of confection of rose are essential to the effectiveness of blue-mass, and propose for its preparation the following formula:—

Take of Mercury,
Finely-powdered Marshmallow root, each 1 troy oz.
Syrup,
Glycerine, each 240 grs.
Tincture of Tolu, 30 minims.

Introduce the mercury into a two-ounce vial containing the tincture of tolu, and agitate briskly, at short intervals, for thirty minutes, or until the mercury shall have become entirely extinguished; then weigh the syrup and glycerine into the vial, agitate briskly, and immediately incorporate with the powdered marshmallow, rubbing the mass until any globules of mercury formed shall have entirely disappeared.

Blue-mass is formed in this manner with less labour, in a shorter time, and of a better consistence, than by any other process known to me. While the mass is decidedly firm, it will remain plastic for a long time, and can be rolled into pills that will keep their shape perfectly. After the addition of the liquid mixture to the powdered marshmallow, the mass retains a very soft consistence for a considerable time, requiring less laborious mixing than when confection of rose is used.

Regarding the use of tincture of tolu in the formation of blue-mass no decided opinion is offered, as I am still engaged with experiments, and hope in the next issue of the *Pharmacist* to present some more satisfactory results.

In connection with this subject, I would offer a few hints regarding other pill-masses that may be familiar to some but new to others.

Quinia pills are dispensed by me preferably, by forming the mass with the aid of glycerine, and rolling the pills in sifted arrowroot. A beautiful white pill is formed, which, by fastidious persons, is preferred to pills rolled in liquorice powder or lycopodium. Some authors object to the use of *glycerine*, on account of technical difficulties, but I have always found it the most convenient excipient for general pill-making, having seldom to resort to any other. Then its tendency to prevent the pills from becoming hard will fully compensate any additional labour that may now and then attend its use.

Several of our physicians prescribe sulph. quinia with tartaric acid, according to a formula published some years ago. Quinia pills so formed may possess some advantage over the simple quinine pills, being probably more readily dissolved and assimilated. The following is the formula:—

Take of Sulphate of Quinia, 30 grs.
Tartaric Acid, 4 grs.
Water, 1 drop.
Mix, and make pills of the required quantity.

The single drop of water is sufficient to form 30 grs. of quinia into a plastic mass, which must, however, be rolled into pills rapidly, else it becomes hard and more water is required.

These pills, like the preceding, should preferably be rolled in sifted arrowroot; in fact, all pills composed of colourless substances should be rolled in this powder, as it, apart from other considerations, necessitates the utmost cleanliness.

Carbolic acid in pills is occasionally prescribed. I have never met with any particular formula, and suggest the following as convenient and satisfactory:—

Take of Carbolic Acid, 1 part
Powdered Elm Bark, 3 parts
Gum Arabic, 1 part
Tragacanth Paste, a sufficiency.
Mix, and make pills of the required size, which may be coated with tolu or silver leaf.

Muriate of Ammonia, when required in form of pills, demands very careful handling, on account of its ready solubility. By adding about ten per cent. of powdered gum arabic, and sufficient tragacanth paste to simply moisten, pills are readily formed by the aid of glycerine.

Ammonio-ferric Alum is sometimes required in the form of pills. A handsome pill is produced by adding about one-eighth part of powd. gum arabic, and making the mass with glycerine, being careful to avoid an excess.—*The Chicago Pharmacist.*

QUINIA, AND SOME ANALOGOUS SUBSTANCES IN PRESCRIPTIONS AS TONICS AND EFFICACIOUS ANTIPERIODICS.

BY J. B. R. PURNELL, M.D.

The object of what follows (a part of which has before appeared in the *Medical and Surgical Reporter*, Oct. 1869) is not to allude to medicine of agreeable taste any more than to speak of certain combinations as more efficacious antiperiodics than quinia sulphate alone. Nevertheless, a knowledge of means of disguising any disagreeable taste—whenever this is possible without damage to remedial power—is and ought to be admitted as important, a palatable remedy being essential in a great many cases to comfort, in not a few to a cure. And, having noticed several accounts of formulæ intended to conceal the bitterness of quinia, I am induced to make some statements—conclusions which I think can be relied upon, being arrived at by some years of observation and many experiments made with care.

Ext. glycyrrhizæ alone (better with a little tannic acid) answers a good purpose with many patients, but a large proportion is usually required (5 grs. may be used for each grain of quinia sulphate or 2 grs. of cinchonia sulphate), and I find the taste of the extract is more often objected to than that of some other things that may be used; hence the importance of a knowledge, if possible, of a variety of substances to be employed to destroy the bitterness.

Tannic acid used in large proportion with quinia sulphate—less for cinchonia sulphate or the alkaloid quinia—conceals the bitterness, and the fact may be well known to the profession generally, or the majority; but it is probably not generally known that a slightly bitter taste of tannate of quinia—more properly a minute portion of precipitated quinine—will be perceived, though not until about half a minute after swallowing the mixture. The same is perceived, to some extent, in the case of any other combination by which the bitterness of quinia or cinchonia is disguised, but is probably more distinct with the tannic acid mixture; to prevent this it is only neces sary to rinse the mouth with water, or with cold tea, which is better.

In the first place, however, it is important to know whether the medical properties of a remedy are at all impaired by the substance used to disguise its taste; and there is evidence that there are many practitioners who would be unwilling to depend upon quinia sulphate combined with tannic acid in large proportion as an antiperiodic.

Quinia in the form of tannate in solution (or rather, in mixture) I have used for several years (in over a thousand cases), and believe it to be in no case less, oftentimes more, efficient as an antiperiodic than sulphate of quinia alone.

Without the aid of any other substance 8 grains of tannic acid will be required to entirely cover the taste of 10 grains of quinia sulphate; it is better, however, to use less, and in combination with aromatics unless an astringent be indicated. But the roughness of tannic acid is unpleasant to many persons. To prevent this, add sugar in abundance and a little aromatic. But if sick stomach should be present much sugar cannot be retained or will be refused (true at least in the majority of cases), and this will be a trouble; and if to the same person the taste of tannic acid should be very unpleasant, there will be another trouble, and the difficulty will be increased. Now in this case, as well as the case of a patient who for any other reason objects both to sweet medicine and tannic acid, if, while employing but little sugar, we use rather less tannic acid and a large instead of a small quantity of aromatic, and dilute the dose sufficiently—though unnecessary to dilute very largely—we shall generally succeed. Though in regard to quinia sulphate directly, a small quantity of aromatic, however used, can accomplish nothing, and the effect of a large quantity, when employed alone, is too trivial to make it useful, the same (large quantity) will nevertheless assist much in disguising it, provided a certain proportion of tannic acid be present.

Some persons who sweeten quinine, expecting by this means to somewhat diminish the bitter taste, only add to the trouble, for the bitterness is increased by the addition of sugar without any other substance, or at least is not lessened in the slightest degree, and is caused to be perceived for a much longer time for the reason probably that it imparts an adhesive property to the solution which, consequently, remains longer on the organs of taste and penetrates.

Cinchona, though containing the alkaloids and not usually requiring tannic acid—a fact readily accounted for from the presence of cincho-tannic acid—will be sufficiently disguised by the use of sugar, cinnamon and orange. Tr. cinchonæ comp., already containing aurantii cort., will require only sugar and cinnamon. For tr. gentianæ comp. tannic acid and sugar may be used, though the addition of syr. sarsaparilla comp. or ext. sars. fl. co. will greatly improve it, or either of the last two named with an aromatic alone can be employed. A palatable and efficient elixir of cinchona may be found in

Parrish's 'Pharmacy.' The following recipes will be adequate to the end proposed:—

℞. Tr. Cinchonæ Comp. f ʒv
Tr. Calumbæ f ʒij
Spt. Lavandulæ Comp.
Tr. Cinnamomi, *aa* f ʒj
Syr. Aurantii f ℥ss
Ext. Glycyrrhizæ ʒss. M.

℞. Tr. Gentianæ Comp.
Tr. Cinchonæ Comp. *aa* f ℥ss
Ac. Tannici gr. ij.
Syr. Sarsaparillæ Co. f ℥i. M.

℞. Tr. Cinchon. Co. f ℥ss
Ferri et Potass. Tart. ʒj
Spt. Cinnamomi f ʒss.
Curaçao f ʒij
Sacch. Alb. ʒij
Aquæ f ℥iij. M.

The fer. et potass. tart. here serves a twofold purpose, since it helps materially to conceal the bitterness. The following formulæ will generally prove efficacious as tonics or antiperiodics, and not unpalatable to the majority of persons, and may be varied somewhat according to the case and the taste of the patient.

℞. Quiniæ Sulphatis gr. xv
Cinchoniæ ,, gr. x
Acidi Tannici gr. x
Syrupi
Syr. Aurantii Cort. *aa* f ʒvj
Ol. Aurantii
Ol. Sassafras, *aa* gtt. iij
Aquæ Cinnamomi f ℥ij Misce.

℞. Quiniæ Sulph. gr. xv
Cinchoniæ ,, gr. viij
Ac. Tannici gr. v
Ext. Sarsapar. Fl. Co. f ʒiij
Syr. Sarsapar. Co. f ℥iss.
Aquæ f ℥i. M.

℞. Quiniæ Sulph. gr. xx
Liq. Potassæ Arsenitis m. xx
Acidi Tannici gr. xij
Syr. Aurantii Cort. f ʒvi
Aq. Menth. Pip. f ℥iij.
M. S. f ʒj ter die. As an antiperiodic f ℥ss–f ℥ij.

℞. Quiniæ Sulph. gr. xx
Cinchoniæ Sulph. gr. xv.
Ac. Tannici gr. vi
Syr. Sarsapar. Comp. f ℥iiiss
Ol. Anisi m. vi
Tr. Cinnamomi f ʒiij.
M. S. f ʒj ter die. As an antiperiodic f ʒss–i.

To prevent the slightly bitter taste which begins to be perceived about half a minute after swallowing the dose, rinse the mouth with water, or with cold tea, which is better.

Coffee (if a good article) in strong decoction, or prepared by displacement or in powder, while it adds to the antiperiodic effect, disguises the taste of a large proportion of the sulphates of quinia and cinchonia and like bitters, as well as some other remedies, not impairing the medical properties, and though not new it seems not to be generally known. It is, perhaps, generally known to have been much used to conceal the taste of senna and magnesia sulphate, and in regard to quinia, Waring mentions the fact on page 229, 'Practical Therapeutics.' He says, "Coffee is of importance as a means of disguising the taste of nauseous medicines, particularly quinine, senna and epsom salts." It is to be remembered, however, that a weak preparation will not do.

℞. Coffee ½ teacupful, Water Oiss.

Use no milk with it unless a very small quantity only is desired to flavour; with or without sugar according to taste.

In relation to this subject there is an important fact to be borne in mind. The quinia or cinchonia sulphate should be put in the coffee in form of powder. If dissolved first with an acid, a decided bitterness will be perceived. So, in the case of anything employed to conceal the taste of quinia sulphate and like bitters, use the bitter in powder, avoiding an acid or (with a few exceptions) any perfect solution.

Cocoa or chocolate, if the quinia sulphate is not in large proportion, conceals the taste to a great extent, provided it be used of a sufficient strength, as in the solid or semi-fluid state. For cinchonia sulphate it will do better, since the taste of this substance is not so difficult to cover.

A decoction—five minutes boiling—of a certain strength (a weak preparation will not answer) of a mixture of green and black teas (I have not succeeded so well with either alone, yet there can be no reason why one will not do), after standing with the leaves for eight hours, disguises the taste of quinia and cinchonia sulphates, though not in so large proportion as coffee. For this purpose:

℞. Theæ V. gr. xxv,—Theæ N. gr. xxxiv, Aq. f ℥iij.
—*American Journal of Pharmacy.*

THE FOOD PRODUCTS OF ST. PETERSBURG.

In a Report on the Food Products of St. Petersburg to the Lords of the Committee of Council on Education, Mr. Andrew Murray has given some very interesting information, the result of inquiries having special relation to the Food Department of the South Kensington Museum and its requirements.

At the Industrial or Agronomic Museum in St. Petersburg he found some curious specimens of what may be called abnormal food, only eaten on occasions of great scarcity, as lichens and sawdust cakes from the north, and different kinds of clay from central Russia; but the normal food was not represented. M. de Solsky, the gentleman in charge of the museum, was engaged in making a collection, and not only gave Mr. Murray every assistance in his power, but insisted on being himself allowed to supply a set of specimens gratuitously to the South Kensington Museum.

The breads resolve themselves practically into different modifications of three chief kinds: tschernoi-chleb, black bread, made of rye; kalatsch, white bread, made of wheat, of which the best kind comes from Moscow; and saika, white bread enriched with raisins or other accessories, equivalent to our buns or Scotch "cookies."

Ices are made in great perfection in St. Petersburg. Those met with in London are all in common use there. In addition, there are some others. One, a very good kind, is made from, or flavoured by, the hazel nut. Another, still better, is a water ice, made from the fruit of the "clucva" or cranberry (gathered after the berry has been touched by frost), sweetened and slightly flavoured by vanilla. In Russia this is much used for invalids, and Mr. Murray thinks it worthy of introduction into this country, or, if already in use, of being more generally known and adopted, not only for the sick-room, where its refreshing coolness and slightly subacid flavour are inexpressibly grateful to the fevered palate, but simply and selfishly for the gastronome. The cranberry is also put to another use in Russia. During the summer months a great traffic in beverages is carried on in the principal streets. Boys with large glass ewers, holding about half a gallon of some coloured liquid, haunt the corners of streets or porticos of buildings. The most common is a rose-coloured drink, which owes its colour and its virtue to the clucva. The other drinks are lemonades and similar concoctions.

St. Petersburg is well supplied with fresh vegetables.

The great vegetable staple of the country, however, is the cabbage, which grows in great perfection, fine, large, solid, white and crisp. It supplies a chief portion of the subsistence of the people all the year round. At the beginning of winter every family lays in a store. At that time the plants are cut down, and chopped up or shred into thin slices. These being packed in barrels with vinegar and salt, a kind of fermentation takes place, the cabbage becoming a kind of sour crout. This is made with meat into a cabbage broth called "shtshi," which is the most characteristic national dish in Russia, and forms the daily food of the mass of the people. Meat is about half the price in St. Petersburg that it is in England, and much more freely used. For 40 kopecks (about 1*s*.) Mr. Murray had a plate of shtshi, with three large pieces of meat in it, sufficient for any average Englishman to have made a copious dinner from. The shtshi is of various degrees of excellence. When the fermentation goes too far, it becomes rather "high;" this, however, is considered a blemish. It also is made to assume various shapes, such as green pea and similar soups, but the subacid flavour is always more or less pronounced. As the shtshi is generally composed of very strong rich bouillon, with only a moderate amount of cabbage, the effect is agreeable. A small dish of sour cream, beautifully white and thick, is placed on the table, in order that the guest may suit the acidity to his taste. Another little dish is sometimes placed alongside the sour cream, and used as a substitute for bread. It consists of a small plateful of fried or roasted groats, which are eaten with a spoon alternately with the shtshi. Garlic is used, if at all, in moderation, and its flavour is not allowed to obtrude itself.

Fungi constitute another food-product which figures largely in the consumption of the upper classes of St. Petersburg. All the chief species used in this country also occur in greater abundance in Russia, and are greatly prized there. The true mushroom (*Agaricus campestris*), the morel and the *Agaricus deliciosus*, are the most generally used, but a great many others are freely eaten.

Leaving the vegetables, and turning to the products which vegetarians look upon as a transition between them and flesh, milk and its phases, it appears that the preparations of milk and curd are more various than in this country. In cheese Russia is making great progress. A kind is now made so like gruyère that it is impossible to distinguish it from it, and it is sold as gruyère. A second variety in the same direction, called meschtschersky, is not unfrequently passed off under the same name. Sour cream is a favourite accessory to many dishes. Its use with shtshi has already been alluded to. It is used with pork as we use apple sauce, and the Germans sour crout.

Mr. Murray found the pork to be very free from trichinæ, a result which he attributes to the precautions taken by the Government to prevent the spread or introduction of diseased meat. The mutton in Russia is much inferior to our own, as it is in all the plains of the North of Europe. The beef and veal appear to be of medium quality.

We can but hurriedly notice the fishes used as food in Russia. The principal of these is the sterlet, a small species of sturgeon, tasting something like an eel, and esteemed a great delicacy. It is taken in immense numbers near the mouth of the Volga at certain seasons of the year. There is also the sturgeon, from which is prepared caviare, pronounced by experts to be the greatest delicacy in existence. This only applies to it in its fresh state, when its green pellets of roe, as large as swan shot, are seen floating in a rich gelatinous menstruum, which disappears in the dried or preserved state. Another fish, called the "schnepel," is cured and smoked, and tastes something between a fresh salmon trout and a kippered herring. Mr. Murray discusses at some length the possibility of naturalizing these and other fishes in the British waters.

Lastly, the drinks of Russia are treated of. The water of St. Petersburg is said not to be altogether wholesome, at least to those unaccustomed to it. New-comers who use it freely usually suffer from diarrhœa. It does not always affect strangers immediately, six months elapsing sometimes before the effects show themselves; these gradually wear off as the stranger becomes acclimatized.

Coffee is generally prepared by the ladies of the household and not trusted to the servants. The material is the same as elsewhere and the product is of good quality.

The tea is very different from that used in England. The strong black high-flavoured Congou, from the south of China, which is most generally drunk here, is almost unknown in Russia. When by accident a Russian has it, such as by present from an English friend, he does not know how to use it; so that the Englishman who wants what he would call a good cup of tea in Russia, must take his tea with him and make it himself. The kind used is the light delicate-flavoured tea from the north of China. However strong the infusion might be made, it would be impossible to make from it one as dark and black as ours. At the strongest theirs never seems to get beyond a light amber colour. A cup of tea of the colour of senna or coffee would revolt them. Hence, when they have English Congou they regulate the strength of the infusion by the colour they are accustomed to see in their own, a standard which, to speak mildly, does not produce strong tea. But their tea has merits not possessed by ours. Coming from the colder districts and more mountainous regions of northern China, it has not the strong aroma of that from the less elevated and hotter slopes of the south, but it has in its place a peculiar delicacy and refinement of flavour. Mr. Murray is inclined to think that this tea must differ also in chemical properties and physiological effects, as the last meal of the Russian is generally a cup of tea, a custom that could hardly be carried out with impunity if our variety were used.

Of the native fermented drinks, there is first a poor beer called "guass," manufactured from the remains of rye used in making bread; it has a muddy appearance and very much the taste and strength of what is known to housewives as "treacle beer." Hydromel is a fermented mixture of honey and water. It is an undecided suppose flat and ungingered ginger beer might be. beverage of a mild character, not unlike what one might

Vodka is a kind of whisky or spirit of wine distilled from rye and usually much diluted. The word is also employed in a general sense. To take a vodka means also to take a dram, and is applied to all kinds of liqueurs. The practice of the Russian is to take a vodka before dinner, and by way of a whet a mouthful or two of caviare and bread, or sardines, or something of that sort. These materials are provided for the guests to avail themselves of before sitting down to dinner; a custom not without its ludicrous side, as we are told that before now strangers have mistaken the "whet" for the dinner and acted accordingly.

With regard to the wines, it is well known that the Crimea, Bessarabia and the Caucasus are becoming great wine countries. Great care has been taken to procure the best vines from France and Germany, and skilled labour has been introduced to instruct the natives in the manufacture. But the result at first was not encouraging. The vines lost their special qualities by the transfer; the grapes had not the same taste, and, as might be expected, the wine was not the same either. By perseverance and continued experiment, a process of selection and elimination being adopted, it was found that, although they could not obtain the old well-known wines, they could produce some well worth drinking, and the wines of these countries are gradually acquiring a character of their own.

TINCTURE OF NUX VOMICA (U.S.).

BY J. B. MOORE.

The tough and corneous character of nux vomica, and the obstacle this offers to the solution of its active constituents, render it one of the most difficult substances in the materia medica to exhaust with a limited quantity of menstruum. It is, therefore, important that the greatest care be exercised in the preparation of the tincture and all the pharmaceutical preparations of the drug.

The U. S. Pharmacopœia directs *fine* powder, No. 60, to be employed in making the tincture, and gives the following directions for its preparation:—"Mix the powder with a pint of alcohol, and digest for twenty-four hours, in a close vessel, with a gentle heat; then transfer the mixture to a cylindrical percolator, and gradually pour alcohol upon it until two pints of tincture are obtained."

Having, in common with many of my brethren in the profession, had frequent difficulty in thoroughly exhausting the drug and obtaining a satisfactory preparation when complying with the above directions, I was induced about two years ago to institute a series of experiments, with the view of so amending the officinal formula and process, that a more uniform and reliable tincture might be made; and, after many experiments with various modes of manipulation, and with powders of different degrees of fineness, I became convinced that a finer powder than is directed in the officinal formula was necessary to ensure the perfect exhaustion of the drug, and that some change in the process was also required. As the result of my efforts, I offer the following modification of the officinal process, as affording the most satisfactory results:—

℞ Pulv. Nux Vomica, No. 80, ℥viij troy
Alcohol a sufficient quantity.

Mix the powder with $1\frac{1}{2}$ pint of alcohol, and digest for twenty-four hours, in a close vessel, at a temperature of 120°, with occasional agitation; then strain through muslin with strong expression, and rub the residue through a No. 20 sieve; then pack it firmly in a glass cylindrical percolator, and gradually pour upon it the expressed liquid, and, when it has all been absorbed, continue the percolation with alcohol until 2 pints of tincture are obtained.

Instead of digesting the drug with only a pint of alcohol, as directed by the Pharmacopœia, I use a pint and a half, as it is desirable to secure the solvent action of as much of the menstruum as is possible during the digestion.

I also direct the mixture to be expressed at the completion of the digestion, as the residue can then be properly packed for percolation. This is of paramount importance to the success of the operation, and is much better than pouring the mixture into the percolator and allowing it to settle and adjust itself, as in the officinal formula, because in doing so the homogeneous condition of the mass is disturbed by the partial separation of the finer and coarser particles.

The residuum should be packed so firmly in the percolator that, when percolation commences, the tincture will not pass at a faster rate than from five to eight drops per minute.

If the above directions are carefully complied with, a good and reliable preparation will result. When the process is completed, the dregs in the percolator will be found to be tasteless, or nearly so.

The almost insuperable difficulties attending the reduction of nux vomica to a very fine powder, with the facilities afforded by any ordinary retail drug store, forbid the idea of any pharmacist attempting to powder the drug for himself; consequently, nearly all are compelled to rely upon the wholesale market for their supply. Therefore, I think that our wholesale druggists should keep constantly on hand nux vomica in *very fine* powder. I presume it is quite a difficult matter to reduce it to so fine a state of division, even by the aid of the appliances of the best arranged drug-powdering establishments; yet, by proper treatment, it can be done.

At the time I was engaged with my experiments I found it impossible to obtain any powdered nux vomica in this market that even came up to the requirements of the Pharmacopœia; and to procure the very fine (No. 80) powder I desired, I was obliged to send to Dr. Squibb, in Brooklyn.

There was but one or two of our wholesale drug houses that had any powder finer than from No. 30 to No. 40. Now, as pharmacists have to depend almost exclusively upon the commercial powder to prepare their tincture from, this would seem to indicate that it is nearly all made from powder entirely too coarse, and must necessarily often be of very deficient strength. To this cause may be attributed the frequent failure of physicians in deriving the desired therapeutic effects from the administration of the tincture. It is not uncommon to hear medical men remark that they have lost confidence in the virtues of tincture of nux vomica, and many have ceased to employ it in their practice. But I believe that if it be carefully and properly prepared, it is as efficient and reliable a preparation of the drug as any that is made.—*Amer. Journ. Pharm.*

Will Snake-Poison Kill a Snake?—Dr. Fayrer, in India, has been experimenting to correct the popular error that a snake cannot kill a snake. He took a young and very lively cobra, fourteen inches long, and which was bitten in the muscular part of the body by a krait forty-eight inches long. The krait had not bitten for some days before. From a detailed report by Dr. Fayrer, it appears that the cobra was bitten at 12.50 P.M. At 1 P.M. it was very sluggish, at 1.3 P.M. so sluggish that it moved with difficulty, could be easily handled, and made no effort at resistance. At 1.20 it was apparently dying, and its movements were scarcely perceptible, and at 1.22 it died, thirty-two minutes after the attack. Dr. Fayrer has found that the water-snakes of India are deadly poisonous. In the Bay of Bengal they swarm, and it is noted as ominous that lately it was proposed to erect a sea-bathing establishment for Calcutta at Barwar, under the assurance that there were no sharks. It is remarked that sharks need not be noticed when a bather may have deadly water-snakes swimming after him.—*Nature.*

Tuba Roots.—The roots of a plant known in Borneo by the name of Tuba or Tooba, are reported to be much valued in that country for destroying vermin on plants or animals. They are thrown into water and allowed to stand a short time, after which the plants or animals are washed with the water. Europeans who have used it say that its effects are sure and instant, and that while fatal to insect life, it does not in the least degree injure the plants or animals to which it is applied. The roots are used when fresh, and evidently lose their properties by drying, as a decoction which had been prepared from some roots received in the dry state has been applied to some plants infested with vermin without the slightest effect. The roots are also constantly used by the natives for poisoning fish in streams and pools. The plant is said to be leguminous.—*The Gardeners' Chronicle.*

Test for Silver-Plating.—In the January number of *Polytechnisches Journal von Dingler* is a simple process by Professor Bœttger for testing the genuineness of silver-plating on metals, which may be of value to many. The metallic surface is carefully cleaned, and a drop of a cold saturated solution of bichromate of potash in nitric acid is placed upon it, and immediately washed off with cold water. If the surface is silver, a blood-red spot of chromate of silver is formed, whereas on German silver or Britannia metal the stain is brown or black.—*Athenæum.*

The Pharmaceutical Journal.

SATURDAY, APRIL 1, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

MR. MUNTZ'S ADULTERATION BILL.

MR. MUNTZ's Adulteration Bill has now been read a second time, and the discussion on its merits is to take place when the Bill goes into Committee. The provisions of the Bill are probably known to our readers, as it was published in a recent number of this Journal. It will be remembered that Mr. MUNTZ intends to deal with the adulteration of food, drink and drugs, and proposes to incorporate in his Bill the Adulteration Act of 1860, and those portions of the Pharmacy Act of 1868 which deal with the adulteration of drugs. The question of the adulteration of food and drink will, doubtless, be discussed in the columns of other periodicals directly interested in the subject; we, therefore, intend to remark more particularly on the regulations for suppressing the sophistication of drugs and the nature of the penalties to be enforced for infringements of the law.

In the Bill are recognized two classes of offenders, namely, those who wilfully admix or who cause to be admixed any ingredient or material with any drug to adulterate the same for sale, and those who sell any drug which is adulterated or not pure. The first class of offenders are for a first offence liable to a penalty not exceeding £50, and for a second to be imprisoned for not more than six months with hard labour. The penalty for a first offence in the second class is a fine not exceeding £20, and for a second offence, in addition to the fine, the justices may cause the offender's name, address and offence to be published in the newspapers.

The provisions of this Bill are certainly not founded on simple justice, for while the adulterator or seller of food or drink cannot be convicted, unless it be proved that he is aware of the adulteration, the vendor of drugs has no such leniency extended to him, as in his case the onus of proof that he had no knowledge of the adulteration rests not with the plaintiff but with the defendant. Why there should be this difference is not for us to say, and probably the framers of the Bill could not give a very satisfactory reply to the question, but we think no distinction ought to be made between such offences, as they are all equally bad, and consequently deserve a like punishment.

It is hoped that when the clauses in the Bill are discussed, attention will be drawn to the fact that by far the greater portion of the drugs used in this country are imported, and that to check adulteration at its source, it is certainly the duty of the promoters of the Bill to take steps to prohibit the importation of all adulterated drugs, and thus give facilities to those dealing in drugs to comply with the law. We hope that this will be insisted on by those anxious to deal justice all round, and it is the more necessary that this all-important thing should be done, because very many druggists have neither the appliances nor the skill to test the genuineness of the drugs they purchase. It will, doubtless, be said that the examination of drugs on importation would cause a great deal of labour and much inconvenience; we are aware it would, but in America the machinery has been devised for such a purpose, and, doubtless, such a thing could be performed equally well in this country. However, of this we are certain, that if adulterated drugs are allowed to be imported without hindrance, and Mr. MUNTZ's Bill becomes law, it will require only a few convictions either to make the law a dead-letter, or to cause the chemists and druggists of the United Kingdom to take a proper view of their position, when their numbers and influence will certainly cause the legislature to pay respect to and redress their grievances.

We are by no means advocates of adulteration, but would gladly do all in our power to assist in its suppression; at the same time it is our duty to point out one of the gravest defects of the Adulteration Bill now before the House of Commons, and we are sure that if this defect be not remedied the Bill will in practice be found unworkable.

PHARMACEUTICAL LEGISLATION IN ILLINOIS.

AMONG the proposals for legislation affecting the practice of pharmacy on the American continent now under discussion is one that has been prepared by the pharmacists of Chicago. The Board of Health of that city having made an attempt to limit the sale of poisons and regulate the dispensing of medicines, failed from not having the necessary powers. Consequently the draft of a proposed law for regulating the practice of pharmacy and the sale of poisons in the State of Illinois has been drawn up, and is now before the State Legislature for adoption. Its principal provisions are—

That on and after the 1st of August, 1871, it shall be unlawful for any but a registered pharmacist or a registered assistant in his employ, or an aid or apprentice under the immediate supervision of a registered pharmacist or assistant, to retail, compound or dispense medicines or poisons.

The persons entitled to registration under the Bill would be (1) "graduates in pharmacy," who have had four years' experience in a store where the prescriptions of medical practitioners are compounded and possess satisfactory credentials of their attainments from a regularly incorporated college or school of pharmacy; (2) "practising pharmacists," who at or prior to the passing of the Act have kept or continue to keep open stores for the dispensing of prescriptions and the sale of drugs and medicines; (3) "practising assistants in pharmacy," of not less than eighteen years of age, who at or prior to the passing of the Act shall have been employed in the compounding of prescriptions of medical practitioners, and who shall furnish satisfactory evidence of their attainments and competency to the Board of Pharmacy. Afterwards none are to be deemed qualified for registration under the Act but "graduates in pharmacy" and persons who have had four years' experience in a store where prescriptions were compounded, and shall pass an examination before the Board of Pharmacy.

The Board of Pharmacy is to consist of three pharmacists, chosen by the Governor of the State from twelve gentlemen to be nominated by the incorporated colleges of pharmacy in Illinois. This Board is to appoint two examiners in each town when necessary, for the purpose of examining candidates for registration as assistant pharmacists. Certain fees are to be paid, and any balance remaining after the expenses of carrying out the Act is to be paid in equal amounts to the library fund of the colleges of pharmacy in the State.

A registrar is to be appointed, who is to prepare annually a list of persons entitled to be registered, a copy of which he is to send free to every registered pharmacist in the State. A registered pharmacist, upon changing his place of business, is to forward a notice of the same, together with a fee of one dollar, to the Board, that the necessary alteration may be made. Once a year every pharmacist is to notify whether he still practises pharmacy at his registered place of business, and to send a fee of one dollar, that his name may be inserted in the register for the ensuing year. The names of persons who do not comply with this regulation, are, after one letter of inquiry from the Registrar, to be omitted from the register.

There are three schedules of poisons attached to the Act, which are as follows:—

Schedule A.—Aconite and its preparations; arsenic and its preparations; corrosive sublimate; cyanide of potassium; hydrocyanic acid; nux vomica and its preparations; opium and its preparations,—excepting paregoric and all preparations containing two grains or less of opium in one ounce; strychnia and all poisonous vegetable alkaloids and their salts; essential oil of bitter almonds, of pennyroyal, of savine, of tansy, and of rue.

Schedule B.—Oxalic acid; sugar of lead; sulphate of zinc; white precipitate; red precipitate; tartar emetic.

Schedule C.—Belladonna and its preparations; cantharides and the tincture; chloroform; cotton root and its preparations; croton oil; digitalis and its preparations; ergot and its preparations; henbane and its preparations; chloral (hydrate); poison hemlock or conium; all mineral acids.

A penalty of fifty dollars is to be inflicted upon unregistered persons keeping open shop for retailing or dispensing medicines or poisons, but provision is made that in rural districts retail dealers may be licensed by the Board to sell the usual medicines and the poisons included in Schedules B and C. Neither of the poisons in the three schedules is to be sold to any person who appears unduly excited or intoxicated; or to a child of less than twelve years of age, or until inquiry has been made of the purpose for which it is required. Poisons in Schedules A and B are to be labelled with the name of the article, the word "poison," and the name and address of the seller. Besides this, an entry is to be made in a book of the sale of poisons in Schedule A, stating the date, name and address of purchaser, name and quantity of article and the purpose for which it is stated to be required.

The dispensing of physicians' prescriptions is exempted from the provisions relating to the sale of poison. It is, however, provided that all prescriptions shall be numbered and filed, and preserved for at least five years; but a copy is to be furnished if demanded by the writer or the purchaser, for which no fee is to be charged.

Another Bill has been framed in Illinois, in reference to the vending of proprietary medicines, requiring that a statement of the ingredients of all such preparations should be filed in the office of the clerk of each county in which they are sold. The *Pharmacist*, referring to this Bill, expresses an opinion that it would not be enforced if passed, and that it would be better to require the formula to be plainly printed upon each bottle or package offered for sale, and to provide a severe punishment for those who do not prepare their nostrums in strict accordance with the printed formula.

In a letter to the *Lancet*, Mr. M. C. Furnell, F.R.C.S., Professor of Physiology at the Madras Medical College, and formerly a student in the Laboratory of the Pharmaceutical Society, has made another contribution to the history of anæsthetics. He says that in 1847, he, being then a pupil at St. Bartholomew's, was trying the effects of sulphuric ether, when he was led by accident to try chloric ether, and found its effect in producing insensibility to be the same, while it was free from the disagreeable taste of sulphuric ether. At Mr. Jacob Bell's recommendation he brought it under the notice of Mr. Holmes Coote, who was then Mr. Lawrence's assistant; and upon Mr. Furnell's assurance that he had tried it on himself, and that it was perfectly safe, it was administered to a patient who was to be operated on that very day. Its success was so decided that Mr. Lawrence subsequently administered it to a lady who could not take sulphuric ether.

We wish to remind our readers that the evening meeting of the Pharmaceutical Society for April will be held on Wednesday next. The papers to be read are, "Alterations in the Pharmacopœia Nomenclature," by Professor Attfield; "Note on Vinum Ferri," by Professor Attfield; and "A Concentrated Form of Mistura Ferri Composita," by Mr. C. A. Staples. The chair will be taken at half-past eight precisely.

General Sir E. Sabine having expressed his intention of resigning the office of President of the Royal Society at the next Annual Meeting, the Council have selected Mr. George Biddell Airy, the Astronomer-Royal, for nomination to the office. Mr. Airy has expressed his willingness to accept office.

The first Report of the Royal Commission was issued on Wednesday. It recommends the consolidation of the School of Mines and the College of Chemistry as a Science School, to be governed by a Council of Professors. It is proposed that mathematics be added to the courses of instruction, and laboratories and assistance for giving practical instructions in physics, chemistry and biology be provided. The Commission recommends that the Science School should be accommodated in the buildings, now nearly completed, at South Kensington, for the projected School of Naval Architecture and Science.

At the semi-centennial meeting of the Philadelphia College of Pharmacy a gold watch was presented to Mr. Procter, the retiring editor of the *American Journal of Pharmacy*, by the members, as a token of their appreciation of the services rendered by him to Pharmacy during his twenty-five years' editorship of that Journal.

According to the *Worcestershire Chronicle*, it having been found by a Board of Guardians that the wine ordered for the patients did not reach them, a resolution was passed to mix an ounce of bark with each gallon of port wine intended for the patients, in the hope that it would thus be rendered unpalatable.

We learn from our contemporary *Nature*, that Mr. Herbert M'Leod, of the College of Chemistry, has been appointed Professor of Chemistry and Experimental Physics at the Indian Engineering College.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Ninth General Meeting of the present Session was held at the Royal Institution, on Thursday evening, March 16th; the President, Mr. John Abraham, in the chair.

The President handed to the Honorary Secretary a Book of MS. Prescriptions, collected and arranged by Joseph Ince, Esq., F.L.S., etc., of London, and presented by him to the library of the Liverpool Chemists' Association. He said the Association would feel much indebted to Mr. Ince for his valuable present, which he trusted students in pharmacy would take advantage of. He also suggested that it would be of service to employers, to test assistants before engaging them. The Council were desirous that the members should have optunity to avail themselves of the benefit to be derived from the collection; and, in order to accomplish this, they had adopted a resolution, which he called upon the Secretary to read:—

"That application for the book be made to the Librarian *in writing*, that no Member or Associate be allowed to keep it longer than three days without being liable to a fine of twopence per day. The written application to be given up when the book is returned."

The President also handed to the Secretary a copy of Bentley's 'Manual of Botany,' 2nd edition, 1870, which the author had requested him to present to the Association.

The Secretary announced donations of the *New York Druggists' Circular*, the Pharmaceutical Journal, etc., to the Library; and a specimen of fresh nutmeg fruit, with leaves, etc., to the Museum, from Mr. Richard Evans.

Unanimous votes of thanks were accorded to the donors for their valuable contributions.

The paper for the evening was read by Mr. James Blair, on "The Chemistry of Calico Printing," No. I. The author very ably showed the various processes from the first stages, describing in detail the chemical composition and combinations of the aniline salts, etc., used to produce the various colours.

The paper was practically illustrated with numerous drawings and photographs of the machinery employed; specimens of cloth, showing the various stages of bleaching and printing, from the raw or grey cloth to the finished pattern of many colours and intricate design.

A short discussion followed, and upon the motion of Mr. Davies, supported by Mr. Garnett and the President, a vote of thanks was accorded to Mr. Blair, for his valuable paper.

BRADFORD CHEMISTS' ASSOCIATION.

At a General Meeting of this Society, held on Friday, the 24th inst.; Mr. Rimmington, President, in the chair, the following resolution was moved by Mr. Joseph Hicks, seconded by Mr. G. H. Whitehouse and unanimously adopted, after a free discussion of the proposed regulations for storing and dispensing of poisons, and ordered to be forwarded to the Council of the Pharmaceutical Society:—

"That this meeting, while wishing to give every reasonable support to the Council of the Pharmaceutical Society in its efforts to promote the interests and the progress of pharmacy, views with regret the decision of the Council to again submit the regulations for storing and dispensing of poisons to the Annual Meeting in May, believing that the education now required now of all who enter the business is the best guarantee of safety to the public."

In acknowledgment of the handsome volume of autograph prescriptions recently received from the parent Society, the following resolution was moved by Mr. J. Hicks, seconded by Mr. F. Bell, and unanimously adopted:—

"That the best thanks of the meeting be conveyed to the Council of the Pharmaceutical Society, for the presentation of the Book of Autograph Prescriptions."

A similar resolution to the last was also adopted, and ordered to be forwarded to Mr. Ince, for his kindness in compiling the collection.

Mr. H. G. Rogerson was elected to fill the vacancy in the Council.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

At the Meeting of this Society on March 2, a paper was read on "The Distillation and Boiling-point of Glycerine," by Mr. Thomas Bolus.

It is well known that when glycerine, subjected to the ordinary atmospheric pressure, is heated so much as to cause ebullition, it is more or less rapidly decomposed by repeated distillations. This decomposition may be, however, entirely prevented by a reduction of the pressure in the apparatus employed to 12·50 mm. The boiling-point of glycerine was determined by effecting the distillation in a long-necked flask, having a supplementary neck attached at right angles to the principal one. In the principal neck, the thermometer was fixed by the aid of a caoutchouc cork, while the smaller neck was connected in a similar manner with a two-necked receiver. The glycerine, together with a few fragments of tobacco-pipe (this latter being required to prevent the bumping which would otherwise occur), being placed in the retort-flask, the receiver was connected with a Sprengel's mercurial pump and a manometer, the caoutchouc joints being made air-tight with glycerine in the usual way. Unless the glycerine distilled had been dehydrated by previous distillation in a vacuum, the first portion of the distillate consisted principally of water; afterwards, when the glycerine in a pure state came over, the temperature indicated by the thermometer was 179·5° C. At this time the pressure on the liquid was 12·5 mm., a pressure nearly corresponding to the tension of aqueous vapour at the temperature of the receiver. A determination of the carbon and hydrogen in the glycerine distilled as above was made; the oxidant employed being copper oxide, followed by oxygen gas (I.), 0·4281 grm. CO_2 and 0·3439 grm. H_2O.

	Theory.		Found. I.
C_3	36	39·1	38·9
H_8	8	8·7	8·9
O_3	48	52·2	
	92	100·0	

Under a pressure of 50 mm., glycerine distils without change at about 210° C. Glycerine, dehydrated by distillation, absorbs water from the atmosphere to the extent of about 50 per cent. of its weight. The amount absorbed is, as might be expected, very variable.

On March 16, Mr. C. Houghton Gill read some notes "On the Examination of Glucose-containing Sugars." Those engaged in the examination of low sugars and molasses have frequently had to complain of obtaining quite unintelligible results. It is well known that the solution of the sugary body is decolorized and clarified by the addition of basic lead acetate before submitting it to optical examination; but Mr. Gill finds that the power of invert sugar to rotate a ray of polarized light is so greatly altered by the presence of this reagent, that the results obtained by the so-called polarization of syrups containing much invert sugar are worthless when the clarification has been effected in the ordinary way. The alteration of rotatory power of pure invert sugar by basic lead acetate is shown by the following experiments:—

15 c.c. of a solution of invert sugar made up to 50 c.c. by water, observed with a Soliel's saccharometer* in tube of 20, read −28·25 at 24° C.

15 c.c. of a solution of invert sugar with water and 2 c.c. of saturated solution of basic lead acetate, observed with a Soliel's saccharometer in tube of 20, read −24·7 at 24° C.

15 c.c. of a solution of basic acetate solution alone, observed with a Soliel's saccharometer in tube of 20, read +57 at 25° C.

These results have been confirmed by many other observations.

The alteration producing this reversal of rotatory power takes place only on the *levulose* of the liquid; the *dextrose* suffers no change of optical properties.

A solution of pure *dextrose* prepared from invert sugar, and reading 60·3, made up to 2 vols. by strong solution of basic lead acetate, read 30·5.

A solution of nearly pure levulose prepared by Dubrunfaut's method, and reading −44 at 20° C., made up to 2 vols. by solution of basic lead acetate, read +6 at 20° C.

The alteration of the rotatory power of levulose is not permanent. On removal of the lead, or on acidifying the liquid, the original rotatory power is restored. The alteration is not due to the alkalinity of the lead solution as regards alkalinity alone, for weak soda or ammonia produce no such change till they begin to decompose and destroy the sugar. It is probable that a soluble lead compound of levulose possessed of dextro-rotatory power is formed.

Now, when a sugar solution containing invert sugar is clarified by basic lead acetate, the invert sugar loses, in part or in whole, its levo-rotatory power, and the first direct reading is too high. When the liquid is acidified and inverted by heat, the original invert sugar has its true levo-rotatory power restored and added to that of the invert sugar proceeding from the cane-sugar, thus producing a greater "difference" in the readings than that due to the cane-sugar alone, and consequently leading to too high a result.

The remedy for this difficulty is to remove the lead and acidify the liquid before making the first reading. For this purpose Mr. Gill uses a strong solution of sulphuric dioxide, which possesses the advantages of removing the lead and bleaching the liquid at the same time, while it is incapable of inverting cane-sugar in the cold even in twenty-four hours. The decolorizing effect is so great that even the worst treacles give liquids of a pale straw colour when thus treated, and, moreover, "inversion" can afterwards be performed without any fear of spoiling the colour, whereas by the ordinary method the liquid frequently becomes too red to allow of optical examination.

Another error also arises from the use of the lead-salt as a clarifier for those sugar solutions in which glucose is to be estimated by the use of Fehling's copper solution. The presence of lead here leads to a result much too low, since it also becomes partly reduced, and thereby necessitates the use of a greater volume of the saccharine solution which is called on to reduce lead as well as the known amount of copper. Sulphuric dioxide serves to remove the lead, while excess of the reagent exerts no other action on the copper solution than that of facilitating the subsidence of the cuprous oxide.

As illustrating the extent of the error which may be introduced by the presence of lead, the following experiment, selected from many others, may be taken (solutions of invert sugar of the same strength used in each case):—

Volume required to precipitate cuprous oxide from 10 c.c. of Fehling's liquid—

(1.) Free from foreign bodies, 10 c.c.

(2.) Containing 10 per cent. of its volume of solution of basic lead acetate, 17 c.c.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Meeting held January 17th, Dr. Pile continued his problems on alcoholic menstrua, for ascertaining the strength of and preparing alcohols of different percentage from a definite strength alcohol.

1. To reduce alcohol to any desired strength.

* The readings of this instrument × $\frac{25·8}{100}$ = angular degrees.

2. To make a definite quantity of any desired strength from a stronger alcohol.

3. To make a mixture of any desired strength by mixing a stronger and a weaker alcohol.

4. To make a definite quantity of any desired strength by mixing a stronger and weaker alcohol.

Answer to Problem 1.—Multiply the quantity of the alcohol (either in fluid ounces or in gallons) by its percentage strength (Tralle's alcoholometer) and divide by the required per cent.: the quotient gives the quantity to which the alcohol must be diluted.

Answer to Problem 2.—Multiply the required amount by the required per cent., and divide by the per cent. of the given alcohol; the quotient gives the quantity to which the alcohol must be made up by the addition of water.

Answer to Problem 3.—Subtract the percentage of the weaker alcohol from the required per cent., the difference indicates the quantity of the stronger alcohol to be used. Next, subtract the required per cent. from that of the stronger alcohol: the result indicates the quantity of the weaker alcohol to be used. Mix the two results together, and as the contraction will be more or less, add sufficient water to make the mixture equal to the quantity of the two liquids before mixing. For example, it is desired to prepare an alcohol of 60 per cent. by mixing an alcohol of 90 per cent. and one of 40 per cent.

$$60\left\{\begin{array}{l}40=20 \text{ of the 90 per cent. alcohol.}\\ 90=30 \quad ,, \quad 40 \quad ,, \quad ,,\end{array}\right.$$

Add water sufficient to make 50 parts.

Answer to Problem 4.—Ascertain the quantity of each alcohol to be mixed (by Prob. 3). The proportion which the required amount bears to the quantity thus shown will indicate the relative proportion of each alcohol to be used. Thus, if 30 parts were required to be made from the two liquids given in the previous example, as 30 is to 3-5ths of the mixture, then 3-5ths of each alcohol must be taken, or 12 parts of the 90 per cent. alcohol and 18 parts of the 40 per cent. alcohol, adding sufficient water to make 30 parts.

These rules comprise most cases which are likely to occur in preparing solutions of alcohol in water, and are interesting problems in pharmaceutical arithmetic.

Dr. Pile described a package of saffron coming under his notice in which covering nearly half an inch of the entire surface was a mass of small worms; in the centre was a mass (about a quarter of the whole) of small specks, which proved upon examination to be excrement of the worms.

Professor Maisch spoke of a sample of adulterated saffron with about 10 per cent. of carbonate of lime fixed to the saffron with some saccharine matter. A sample was also observed in Switzerland containing 3 or 4 per cent. of the same adulteration. Mr. Hanbury, of London, about the same time examined a specimen containing 15 or 16 per cent. of the same material fixed to the stigmas. These specimens had no suspicious appearance until placed under the lens of an ordinary magnifying glass, when the fraud was easily detected. By throwing the suspected samples into water, the carbonate of lime will fall to the bottom of the vessel, while the saffron will float. Prof. Maisch also spoke of a sample, of frequent adulteration,—carthamus and calendula having been dyed with a solution of true saffron. This sample also contained a large quantity of the styles of crocus.

Mr. M'Boring spoke of the difficulty of filtering a tincture of senega after having been evaporated preparatory to making compound syrup of squill, owing to the large quantity of pectin contained in the senega. The question was asked, whether bicarbonate of potash interfered with the tartar emetic.

Prof. Maisch replied that he did not think there was any change in tartar emetic, the bicarbonate only neutralizing any excess of acid that may exist in the preparation.

Dr. Pile inquired for a practical test for glycerine, one that may be employed without delay and with little preparation, one to be proof against the ordinary and most common adulterations.

Mr. Remington, who has been making some experiments in this direction, gave as his experience, after the examination of several (eight or ten) specimens of the most prominent makers, that a glycerine which is not discoloured by nitrate of silver in solution was generally pure; the nitrate will in five minutes show a discolorization should impurity exist. He considers that sulphuric acid is not thoroughly reliable; there is a possibility that the bottle in which it is kept contained straw, cork, or some organic matter, upon which the acid would immediately act, and possibly condemn a pure glycerine in this way. Trommer's test may also be applied to glycerine, and is entirely reliable in determining the presence of sugar.

Mr. Shoemaker produced a circular on "Ætherlidon Chloral," used in Berlin as a substitute for chloroform, without unpleasant result.

Prof. Maisch gave the results of his experiments with hydrate of chloral of different makes generally known as German. The experiments were made with a view to overcome, if possible, the disagreeable pungency found on opening almost every vial of this salt. The pungency is probably due to an excess of hydrochloric acid. Attempts were made to neutralize this with carbonate of ammonia. This seemed to overcome the unpleasantness for a short time; when, however, the bottle was again unstoppered the hydrate chloral possessed the same qualities.

A sample of crystallized hydrate of chloral was exhibited. This preparation is more permanent and may be crystallized from bisulphide of carbon. The chloral fuses by heating the bisulphide to about 60° or 65°. On cooling, the entire solution is filled with crystals. The following process was detailed:—Take a half-gallon retort, with capacious neck; into this place 1 lb. bisulphide of carbon and 5 oz. of commercial hydrate of chloral; stop the neck of retort with a small piece of cotton, to prevent waste of bisulphide; place the bulb of retort in hot water; the chloral will first fuse; agitate the retort until entirely dissolved; set aside to crystallize; by keeping the neck of retort cool during process the vapour of the bisulphide when condensed will flow back into retort; by careful use the bisulphide will serve for several operations. Allow the crystalline mass to remain several hours in retort, when, with a glass rod, the crystals can be removed, dried, and are ready for use. The solution drawn off still contains chloral, which will in time crystallize. The crystals are long, needle-shaped, sometimes reaching 2 or 3 inches in length. In this form chloral is possessed of little or no pungency, and is far preferable for dispensing purposes. By placing aqua ammoniæ near chloral as met with in commerce, dense white clouds are formed, indicative of hydrochloric acid.

At the Meeting held February 21st, 1871, a communication from Mr. Charles Bullock was read, as follows:—

"A disaster, occasioned by the breaking of large show-bottles from freezing, during the late cold weather, led to experiments to determine the congealing-point of mixtures of glycerine with water, with results as follows. Common glycerine, sp. gr. 1·250=29° B., was used:—

½ pint glycerine in	1 gall.	of water	congeals at		.	30° F.
1 ,, ,,	1	,,	,,	,,	.	24° F.
1½ ,, ,,	1	,,	,,	,,	.	18° F.
2 ,, ,,	1	,,	,,	,,	.	10° F.
3 ,, ,,	1	,,	,,	remains fluid at		3° F.

Prof. Maisch spoke of a combination of oil of wintergreen and sesquichloride of iron as forming a very beautiful colouring material for show-bottles. Prof. Procter thought this combination was not permanent enough, as it soon lost its brilliancy by exposure to the sunlight.

Prof. Procter mentioned an article, by Mr. Wharton, of Nashville, Tenn., recommending the use of carbonate of magnesia in making syrup of senega and comp. syrup of squills. The magnesia is used similarly to the process for the officinal waters, and is said to entirely overcome the objectional cloudiness generally found in this preparation, forming, probably, a pectate of magnesia.

Mr. England said he had no difficulty in making a clear preparation, by percolating the senega with diluted alcohol first, then using water, evaporating the watery solution, mixing with the tincture first obtained, boiling, evaporating and allowing to settle, filtering and adding the sugar.

Mr. M'Intyre had used glycerine and carbonate of magnesia; the glycerine to prevent the extract formed by evaporating from becoming too hard and unmanageable. This preparation was pronounced to be very satisfactory.

Prof. Procter spoke of the original formulæ for comp. syrup of squills, as invented by Dr. Cox, which consisted of a watery extract evaporated to syrupy consistence and combined with honey.

Mr. Gailard had used with success carbonate of magnesia in the preparation of tinct. nux vomica, which obviates any cloudiness from fixed oil.

Prof. Maisch made some further remarks upon the crystallization of chloral hydrate from bisulphide of carbon. Not being able to entirely free the crystals from the unpleasant taste and smell of the solvent, alcohol was experimented with. One half-pint was used, and dissolved 17½ ounces of chloral as fast as it was added, the mixture measuring 18 fluid ounces. Prof. Maisch could not report finally on this process until the next meeting. Chloral does not evaporate as fast as is generally supposed.

Mr. Shinn exhibited two lemons which had been wrapped in tinfoil since November. On examination one of them had undergone partial decomposition, while the other remained fresh, having the characteristic odour. They could be bought when plentiful at 15 c. a dozen, and kept in this way for a great length of time.*

Prof. Maisch exhibited some seeds of strychnos, with structure similar to that of nux vomica, which came as ballast from the East Indies, and were bought by a New York drug house. It was supposed to be from the *Strychnos Tieuté;* the fruit of which was about the size of a cherry, having six large seeds. No experiments were made towards obtaining strychnia from this species.

Mr. England suggested a plan for preparing fluid extract of vanilla, by using powdered quartz in connection with sugar. This was thrown into a bottle closely corked and boiled. By this means the aroma of the vanilla is retained, and the bean entirely exhausted.

Prof. Procter spoke of purifying residuary alcohol, and the difficulty in overcoming the odour of some substances—buchu, or cubebs, for instance. He mixed alcohol recovered from many different preparations, added 20 grs. permanganate of potash per gallon in ℥ij of water, and after a day's contact distilled; he could not destroy odour of buchu.

Prof. Maisch exhibited a specimen of cherry grown as an ornamental tree in some Southern cities, but native of West Indian Islands and Panama. This plant has a very strong odour of hydrocyanic acid. The leaves have the margin entire, which was rare in the cherry family. He said it was the *Prunus* or *Cerasus occidentalis.* It could be used in making cherry-laurel water, and for preparing an oil similar to oil of sweet almonds, which is almost entirely derived from peach kernels.

Some remarks were made on a recent law-suit concerning a lot of adulterated assafœtida, which was purchased by a wholesale house. Upon being examined it was found to be largely adulterated with gypsum. From this fact the parties refused to take it. The law was resorted to, and after a thorough examination it was found to contain in some specimens as high as 60 per cent. of sulphate of lime; the case containing the best article, when examined, proved to be composed of 27 per cent. of the same material. The case was decided for the defendants, the jury pronouncing the assafœtida unmerchantable.

Prof. Maisch exhibited a specimen of Tampico jalap, which comes into this market very rarely,—then only as a materia medica specimen.

Mr. England recommended the use of butter in making citrine ointment, being careful to free the butter from salt.

* This is E. Baudriment's method; see *ante*, p. 4.

MEETINGS FOR THE ENSUING WEEK.

Monday April 3. ......*Medical Society,* at 8 p.m.
London Institution, at 4 p.m.—"On Astronomy." By Mr. R. Proctor.

Wednesday April 5. ...*Pharmaceutical Society of Great Britain,* at 8.30 p.m.—"Alterations in Pharmacopœia Nomenclature necessitated by the Advancement of Chemistry." By Prof. Attfield.—"Note on Vinum Ferri." By Prof. Attfield.—"A Concentrated Form of Mistura Ferri Composita." By Mr. C. A. Staples.

Thursday April 6. ......*Linnean Society,* at 8 p.m.
Chemical Society, at 8 p.m.—"On 'Burnt Iron' and 'Burnt Steel.'" By W. Mattieu Williams.—"On the Formation of Sulpho-acids." By H. E. Armstrong.
London Institution, at 7.30 p.m.—"Economic Botany." By Professor Bentley.

Saturday ...*Royal Botanic Society,* at 3.45 p.m.

Parliamentary and Law Proceedings.

A BILL TO ESTABLISH THE METRIC SYSTEM OF WEIGHTS AND MEASURES.

Whereas it is desirable that the weights and measures of the United Kingdom should be decimalized, and made to correspond with those of other countries.

And whereas the use of metric weights and measures is now legal, but no provision has been made for procuring the standards of said metric weights and measures, and for verifying and stamping those in use under the said Act.

Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons in this present Parliament assembled, and by the authority of the same, as follows:—

1. From and after the expiration of —— years after the passing of this Act, the length of the metre to be prepared under the authority of the Privy Council for Trade, verified by comparison with the original standard in Paris, having the words and figures "Standard Metre, 1871," engraved upon it, and kept in the custody of the Warden of the Standards, shall be and is hereby declared to be the unit or only standard measure of lineal extension, wherefrom or whereby all other measures of extension whatsoever, whether the same be lineal, superficial or of capacity, shall be derived, computed and ascertained, and all such measures shall be taken in decimal multiples or decimal parts of their respective units.

2. The unit of the measure of surface shall be the square of ten metres, which shall be and is hereby denominated the "are."

3. The unit of the measure of capacity, as well for liquids as for dry goods, shall be the cube of a tenth of the metre, and the same shall be and is hereby denominated the "litre."

4. The unit of weight shall be and is hereby denominated the "gram." A thousand grams shall be and is hereby denominated the "kilogram." A standard of the

kilogram shall be prepared under the authority of the Privy Council for Trade, verified by comparison with the original standards in Paris, and have the words "Standard Kilogram, 1871," engraved upon it, and the same shall be kept in the custody of the Warden of the Standards.

5. For the more convenient use of metric weights and measures, it shall be lawful to take the double and the half of all the said units, and their decimal multiples and decimal parts.

6. The said weights and measures hereby established shall be and are hereby denominated the standard metric weights and measures, as shown in the table hereto annexed.

7. Copies and models of the same standard metre and kilogram shall be sent to the Lords Mayors of London and Dublin, to the Lord Provost of Edinburgh, and to all counties, shires, stewartries, ridings, divisions, cities, towns, liberties and places in which by law copies and models of the standard imperial weights and measures are required to be kept, and to such other places and persons as the President of the Committee of the Privy Council for Trade may from time to time direct.

8. All judges, magistrates and other person or persons who now are or shall hereafter be authorized by law to order or provide copies of the present imperial standard weights and measures shall at all times hereafter have like power and authority in every respect to order or provide copies of the standard metric weights and measures, and to charge the expenses thereof upon the fund or funds, money or moneys, that would have been liable in case it had been copies of imperial weights and measures that had been ordered or provided.

9. All and every the provisions and provision which are by law in force with respect to the inspection, verification, reverification, stamping, counterfeiting and modes of conviction, with the penalty or penalties relating thereto, of the present imperial standard weights and measures, shall apply to and be in force with regard to the standard metric weights and measures in every respect as if the said standard metric weights and measures were comprised in and designated by the imperial weights and measures in the Acts relating to such inspection, verification, reverification, stamping, counterfeiting and modes of conviction, and the penalty or penalties relating thereto as aforesaid.

10. From and after the expiration of —— years from the passing of this Act, the imperial and all local or customary weights and measures shall be abolished, and every person who shall sell by any denomination of weights and measures other than those of the standard metric weights and measures, or such decimal multiples or decimal parts thereof as are authorized by this Act, shall, on conviction, be liable to a penalty not exceeding the sum of 40*s*. for every such sale.

11. From and after the expiration of —— years after the passing of this Act, if any person or persons shall print, or if the clerk of any market or other person shall make any return, price list, price current, or any journal or other paper containing price list or price current in which the denomination of weights and measures quoted or referred to shall denote or imply a greater or less weight or measure than is denoted or implied by the same denomination of the metric weights and measures under and according to the provisions of this Act, such person or persons or clerk of the market shall forfeit and pay any sum not exceeding 10*s*. for every copy of every such return, price list, price current, journal, or other paper which he or they shall publish.

12. As soon as conveniently may be after the passing of this Act, accurate tables shall be prepared and published, under the authority of the Committee of Privy Council for Trade, showing the proportions between the imperial weights and measures heretofore in use and the standard metric weights and measures hereby established, with such other conversions of weights and measures as the said Committee of the Privy Council for Trade may deem necessary, and after the publication of such tables all future payments to be made shall be regulated according to such tables.

13. And whereas the weights and measures by which the rates and duties of the customs and excise and other her Majesty's revenue have been heretofore collected are different from the metric weights and measures directed by this Act to be used: It is hereby enacted, that so soon as conveniently may be after the passing of this Act, accurate tables shall be prepared and published under the direction of the said Committee of the Privy Council for Trade, in order that the several rates and duties of customs and excise and other her Majesty's revenue may be adjusted and made payable according to the respective quantities of the standard metric weights and measures directed by this Act to be used, and that on the expiration of —— years after the passing of this Act the several rates and duties thereafter to be collected by any of the officers of her Majesty's customs or excise or other her Majesty's revenues shall be collected and taken according to the calculations in the tables to be prepared as aforesaid.

14. From and after the passing of this Act, and until the use of the metric weights and measures shall be made compulsory, the said metric weights and measures shall be deemed and taken to be legal weights and measures, and as such may be used for all purposes whatsoever.

15. As soon as conveniently may be after the passing of this Act, the metric standards to be provided under this Act shall be placed in the custody of the Warden of the Standards, and the Committee of the Privy Council for Trade shall cause the metric weights and measures in use under the present Act to be verified and stamped in the same manner as the imperial weights and measures are now required to be.

16. From and after the passing of this Act the "Metric Weights and Measures Act, 1864," shall be and is hereby repealed.

TABLE OF STANDARD METRIC WEIGHTS AND MEASURES.

Measures of Length.

Systematic Names.	Metres.	Value.
Myriametre . .	10,000	Ten thousand metres.
Kilometre . .	1,000	One thousand metres.
Hectometre . .	100	One hundred metres.
Dekametre . .	10	Ten metres.
Metre	1	Unit of measure of length.
Decimetre . .	·1	The tenth of a metre.
Centimetre . .	·01	The hundredth of a metre.
Millimetre . .	·001	The thousandth of a metre.

Measure of Surface.

	Square Metres.	
Hectare . . .	10,000	One hundred ares, ten thousand square metres.
Are	100	Unit of measure of surface.
Centiare . . .	1	One hundredth of the are.

Measure of Capacity.

	Cubic Decimetres.	
Kilolitre . . .	1,000	One thousand litres.
Hectolitre . .	100	One hundred litres.
Dekalitre . .	10	Ten litres.
Litre	1	Unit of measure of capacity.
Decilitre . . .	·1	The tenth of a litre.
Centilitre . .	·01	The hundredth of a litre.

Measure of Weight.

	Grams.	
Millier or ton .	1,000,000	One thousand kilograms, the weight of the cubic metre of water and of the ton.
Quintal . . .	100,000	One hundred kilograms.
Myriagram . .	10,000	Ten kilograms.
Kilogram . .	1,000	One thousand grams.
Hectogram . .	100	One hundred grams.
Dekagram . .	10	Ten grams.
Gram	1	Unit of weight.
Decigram . .	·1	The tenth of a gram.
Centigram . .	·01	The hundredth of a gram.
Milligram . .	·001	The thousandth of a gram.

Adulterated Tea.

At the Shropshire Quarter Sessions, the report presented by the analyst committee stated that a number of samples of tea, etc. had been submitted to Dr. Johnson and Mr. Blunt for analysis. The former reported that he had analysed fifteen samples of tea and seven of flour; and the latter twelve samples of tea. In four samples of tea a few grains of iron were detected by the use of the magnet, but in such insignificant quantities as not to call for proceedings against the vendors. The remaining samples of tea were of a fair average character. In seven samples of flour which had been analysed no adulteration was found.—*Grocer.*

Death from an Overdose of Laudanum.

At Salford, an inquest has been held upon a child seventeen days old. On Sunday the child became unwell, and continued so until the next day, when its mother administered three drops of laudanum. For a time it appeared benefited, but subsequently relapsed, and died the same night. Verdict, "Died from the effects of an overdose of opium."—*Medical Times.*

Deaths from Overdose of Chloral Hydrate.

An adjourned inquest was held last week to inquire into the death of Mr. Raphael Mendola, surgeon, of Victoria Park. After hearing the evidence of Dr. Letheby, who had analysed the contents of the stomach, the jury returned a verdict "That death had resulted from a dose of chloral, but that there was no evidence to show under what circumstances it was taken."

Shortly after the inquest, a letter was addressed to the newspapers by the solicitors to the deceased gentleman's family, stating that they had discovered that Mr. Mendola had recently purchased an ounce of chloral hydrate from the wholesale druggists with whom he generally dealt, stating that he intended to use it to relieve paroxysms of pain from which he occasionally suffered. It appeared from the *post-mortem* examination that the deceased was suffering from fatty degeneration of the heart.

Another inquest was held on Monday, at the Middlesex Hospital, upon the body of Mr. Edwin Charles Smallman, M.R.C.S. For some time past deceased had been in the habit of taking morphia to induce sleep. On Friday morning he was discovered dead in his bed. By the bedside was a bottle which had contained chloral hydrate. The *post-mortem* examination showed that the deceased had been in a very bad state of health, and that his death resulted from an overdose of chloral, taken while in a state of great weakness, probably for the purpose of obtaining sleep, and relieving pain. The jury returned a verdict of "Death from natural causes."

Suicide by Oxalic Acid.

On Friday, March 24th, an inquest was held on the body of John Lovelace. It appeared that the deceased had been taken into custody on a charge of attempting to murder his wife. When apprehended, a paper and white powder were noticed lying on the floor. Soon after being taken to the station he began to vomit. A doctor was sent for, but before he arrived the man was dead.

Professor Attfield said that he had made an examination of the contents of the stomach, and that there was enough oxalic acid in the stomach to account for death.

The son of the deceased said his father was a shoemaker, and used oxalic acid in his business.

The jury returned a verdict of "Suicide while in an unsound state of mind."—*Times.*

Standards of Weights and Measures.

(*From the London Gazette, March* 28, 1871.)

The following imperial measures of capacity, which have been constructed and duly verified and authenticated in the Standards Department of the Board of Trade, and their capacity accurately determined in relation to the imperial standard measure of capacity established under the provisions of section 6 of the Act 5 George IV., cap. 74, have been declared to be legal secondary standards of capacity, in pursuance of sections 6 and 8 of the Standards of Weights, Measures, and Coinage Act, 1866, viz.:—

Imperial Standard Measures of Capacity.

Liquid Measure.—The quarter-gill, equal to 1-128th gallon.

Bottle Measures.—The bottle, equal to 1-6th gallon; the half-bottle, equal to 1-12th gallon.

Fluid Ounce Measures.—Measures containing respectively the following weight of distilled water, at the temperature of 62 deg. Fahrenheit's thermometer, weighed in air at the temperature of 62 deg. of Fahrenheit's thermometer, the barometer being at 30 inches, viz.:—Four avoirdupois ounces, two avoirdupois ounces, one avoirdupois ounce, half an avoirdupois ounce. Note.—The following ounce measures are already legalized as imperial standard measures of capacity, viz.:—Quart, equal to 40 fluid ounces; pint, equal to 20 fluid ounces; half-pint, equal to 10 fluid ounces; gill, equal to 5 fluid ounces; half-gill, equal to $2\frac{1}{2}$ fluid ounces; quarter-gill, equal to $1\frac{1}{4}$ fluid ounces.

Liquid Measures of Grain Weights of Distilled Water.—Measures containing respectively the following weight in grains of distilled water, at the temperature of 62 deg. of Fahrenheit's thermometer, weighed in air at the temperature of 62 deg. of Fahrenheit's thermometer, the barometer being at 30 inches, viz.:—7000, 4000, 2000 1000 grains; 500, 300, 200, 100 grains; 50, 30, 20, 10 grains; 5, 3, 2, 1 grain.

BOOK RECEIVED.

Handbuch der Pharmakognosie und Pharmakologie für Aerzte, Studirende der Medicin und Pharmacie, Apotheker und Droguisten. By Prof. Dr. Archimedes von Schwarzkopf, Teacher of Pharmacognosy, National Economy and Commercial Science at the University of Basle and Director of the Germano-Swiss Commercial School. Part I. Leipzig und Heidelberg: C. F. Winter'sche Verlags-handlung. 1871.

The following journals have been received:—The 'British Medical Journal,' March 25; the 'Medical Times and Gazette,' March 25; the 'Lancet,' March 25; the 'Medical Press and Circular,' March 30; 'Nature,' March 23; the 'Chemical News,' March 24; 'Journal of the Society of Arts,' March 23; 'Gardeners' Chronicle,' March 25; the 'Grocer,' March 25; 'Produce Markets Review,' March 25; the 'English Mechanic,' March 24; the 'Journal of the Royal Institution.'

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[64.]—COLD CREAM.

℞. Cetacei,
Ceræ Alb., āā ℥ss
Ol. Amygd. D. ℥iv
Otto Rosæ gtt. xx.
M. Geo. B. Gudgen, *Kimbolton.*

[166.]—BLACK INK.

℞. Gallæ Aleppo Cont. ½ lb.
Ligni Hæmatoxyli 2 oz.
Gum. Acaciæ 3 oz.
Ferri Sulph. 4 oz.
Alum. Sulph. 1½ drm.
Cupri Sulph. 1½ drm.
Aquæ Moll. 1 gall.

And a small quantity of muriate of soda dried, and a few drops of creasote.

This is a good ink. It must be done by cold digestion, as heat takes out the starch from the galls, which increases the tendency to mouldiness; and I always dry the sulphate of iron.—J. H.

[183.]—HOLBECK TINCTURE.

℞. Tr. Rhei Co. ℥iij
Tr. Cardam. Co. ℥j
Tr. Opii ℥ss
Sp. Vini Rect. ℥iss
Aquæ Puræ ℥ij.

This is a Leeds form, taking its name, from some peculiarity unknown to me, from a place called Holbeck, near Leeds. It is a stimulant and partly antispasmodic; the dose should be regulated by the quantity of tr. opii it contains.—J. H.

[186.]—BAKING-POWDER.—"*Farina*" will find the following a good formula:—

℞. Sodæ Bicarb. ℥xvj
Pulv. Acid. Tart. ℥xiv
„ Magnes. Carbon. ℥vj
„ Farinæ ℥xij
M. Rub through a sieve.—Harry.

"*Senega*" sends the following excellent receipt:—

℞. Pulv. Acid. Tart. 8 oz.
Pulv. Sodæ Bicarb. 9 oz.
Rice Flour 10 oz.
M. A teaspoonful to every pound of flour.

℞. Sodæ Bicarb. 1 lb.
Farinæ 1 lb.
Pulv. Alum ¾ lb.
Magnes. Carb. ½ oz.

Dry in oven separately. Magnesia may be put on the flour. If Scotch farina can be got, it is better than English ordinary farina. Mix.

P.S.—Acid. tart. may be used, if preferred; but the writer has found quite as ready a sale for it with pulv. alum.—J. H.

[188.]—WATERPROOFING.—

Bisulph. Carbon. ℥ij
Gutta Percha ℥ss
G. Asphalt. ℥ij
(Brown Amber) ℥ss
Ol. Lini ℥xij.
Misce.

Dissolve the gutta percha in the bisulph. carbon., the asphalt and amber in the oil, and mix well.—D. L. Jones.

[198.]—COD-LIVER OIL.—Can any of your readers give a short descriptive process of the manufacture of cod-liver oil at Newfoundland?—Alpha.

[*** Papers on this subject have already been published in the Pharmaceutical Journal: by Professor Soubeiran, 2nd Ser., Vol. VIII. p. 39; and by Mr. Howden, 2nd Ser., Vol. VI. p. 191, and Vol. IX. p. 312. Information as to the different methods of preparation will be found also in Cooley's Encyclopædia.—Ed. Pharm. Journ.]

[199.]—GAS BLADDERS. — Will any correspondent kindly furnish me with a method for keeping bladders in a soft pliable condition, suitablo for experimenting with gases?—Nil sine Labore.

[200.]—LEMONADE.—Will any reader oblige me with a good receipe for making lemonade *without a machine?*—Harry.

[201.]—SOLID YEAST.—"*Aroma*" wishes to be furnished with the formula for solid yeast given in the transactions of the Royal Scottish Society of Arts.

[202.]—SYRUP OF SANTONINE.—*J. E. B. M.* wishes for a form for making syrup of santonine.

[*** Our correspondent will find the information he requires in the abstract from Dr. Harley's paper on Santonin, *ante*, p. 667.—Ed. Pharm. Journ.]

[203.]—MILK OF MAGNESIA.—Will any reader favour me with a receipe for the preparation sold under this name?—Vincit Amor Patriæ.

[204.]—LINIMENTUM RUBRUM.—Can any of our dispensers give me a formulary for this article, used sometimes in prescriptions?—Vincit Amor Patriæ.

[205.]—COD-LIVER OIL AND QUININE.—Can any correspondent kindly oblige me through the medium of your paper with a formula for an elegant preparation of cod-liver oil and quinine or cod-liver oil, quinine and iron?—T. E. R.

[*** Some information on this subject will be found in the Pharmaceutical Journal, 1st Ser., Vol. XV. p. 475, and Vol. XVII. p. 36.—Ed. Pharm. Journ.]

[206.]—PEPSINE WINE.—Will any reader kindly furnish me with a good formula for making pepsine wine?—James Doubell.

[207.]—SOAP POWDER.—I shall feel obliged by being supplied with a receipe for soap powder, suitable as a toilet soap.—D. S. Anderson.

[208.]—ALUMINIUM.—Wanted, the address of a worker in this metal; or where shreds or shavings of same may be cheaply procured.—P. C.

[209.]—CORN SOLVENT.—*T.* would feel obliged by being informed of a good solvent for soft and hard corns.

[210.]—COD-LIVER OIL JELLY.—"*Senega*" would feel obliged if any correspondent would send him a formula for cod-liver oil jelly.

[211.]—HORTICULTURAL INK.—Can any of your correspondents give me a good receipt for making horticultural ink? Beasley has been tried.—A. P. S.

[212.]—WOOD STAIN.—"*Pyroligneous*" wishes for a good receipe to stain wood oak-colour.

[213.]—LIQ. AMMONIÆ VALERIANATIS.—Can any of your readers give me a formula for liq. ammoniæ valerianatis?—A. B.

[214.]—SOLUTION OF ATROPIA.—*Associate P. S.* (Exeter) wishes to be informed how eight grains of atropia can be held in solution in aq. destil. ℥j without the addition of spirit or acid. sulph. dil.? To be used for complaints of the eye.

[*** According to Klever's table, published in last week's Journal, p. 763, it might be effected by glycerine or a mixture of glycerine and water.—Ed. Pharm. Journ.]

Erratum.—On p. 737, No. [159], "Aniseed Cordial," *for* Sp. Vin. Rect. ʒviij, *read* Sp. Vin. Rect. ℥viij.

Correspondence.

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

OUR MONTHLY EVENING MEETINGS.

In the number of this Journal issued March 11th, I read with attention a leader bearing the above title. As a constant attendant and sometimes contributor, I have taken considerable interest in these meetings. Amongst other contributions of mine in the Journal, I find three upon this particular subject, the first dated August 10th, 1857, when I endeavoured to stir up the members, etc. to more energy and better attendances. It appeared to me at that time that the chief reasons which deterred many from contributing, especially the young, were diffidence, the dread of criticism,—it has been sometimes, I have felt, over-sharp,—and the difficulty of finding something new; but I believe I cleared away these seeming impediments.

It is clear, nevertheless, from past experience, that if we are to have papers and good attendances some system must be established for securing them; and it appears to me that the plan of an annually-selected committee for the express purpose, as recommended in the said leader, would be a good one.

Old contributors require whipping up, young ones a little encouragement. *Embryo* authors are naturally timid, and, like exotic plants, want nursing and gentle forcing.

Our Society does not, I feel sure, stand alone in the matter of occasionally flat and uninteresting evenings, and, without descending to particulars, many circumstances during the two past sessions have in some measure tended to the present state of our monthly evening meetings. In the future may there be much improvement!

There is a difficulty; how it is to be got over has to a great extent been suggested.

I intrude again, in order that the matter may be kept prominently before the members, associates, etc. generally and the in-coming Council especially, so that the seed now sown may not be unproductive for lack of encouragement and culture.

18, *Conduit Street*, A. F. HASELDEN, V.P.
March 27*th*, 1871.

A MEDLEY.

Sir,—Si mihi licet "desipere in loco" hoc, I will send you a medley this time, which may serve to relieve the dryness of the present "legal" discussion.

Can any of your readers or yourself tell me why some tinct. cinnam. co., which has been made a long time, has deposited all its colouring matter in the form of a loose brown powder at the bottom, and not upon the sides of the bottle at all? I did not make it, but, knowing who did, I have no reason to believe it otherwise than strictly P. L.

I once removed my bergamotte bottle (containing a very fine sample, I thought) from the shade to a position where the sun during part of the day shone directly upon it. It assumed in a comparatively short time, as seen through a thick incrustation on the sides of the bottle, the appearance of weak muddy coffee, and its fragrance was decidedly impaired. Having previously enjoyed a due north aspect without a ray of sunshine, I was not prepared for this, and cannot account for it. Thinking the sample might be in fault in some way, I placed a second lot of "super." at 18*s*. in the same situation, but soon found it changing, and removed it.

But the following is my greatest puzzle:—Considerably more than two years ago, a painter employed in my house, but not needing for his work with me any such colour, borrowed my gum-brush. It was lost for about a week, but turned up again, stained of a most intense crimson. If this man did not so stain it, I cannot conceive who or what did. It was rinsed out in boiling water, and restored to its former use. Since that time it has been constantly used for the one purpose, repeatedly and well rinsed in hot water as well as the pot, and the gum—tragacanth—renewed on an average once a fortnight perhaps; notwithstanding which, to this day it continues to impart a decidedly pink tinge to every successive lot of mucilage. At first, of course the colour gradually imparted was deep, but I thought I should wear it out, and curiosity impelled me to continue to use it, as it now does to ask, what can the dye be? Any one can see the brush in use.

Any one may also see the following order, distinctly and very fairly written, with two errors of spelling,—transparently such,—only:—

"The high dried up azh poweder,"

as it is in my possession. My customer—for I supplied him with threepennyworth of the article wanted—was a poor Irishman, who had evidently got some better-educated friend to write down the name, probably from his own dictation.

This may exercise the ingenuity of some of our younger friends, and the following will make them laugh:—

A respectably-dressed child, of seven or eight years old, came one day into my shop, and asked for "A pennyworth of Uncle William's pills." I told her I had not the pleasure of knowing her uncle, and dismissed her; but before she got out of the door she returned, saying, "Mother said, Aunty Billy's, but I thought it couldn't be right."

Lastly. As my contribution to the question of dispensing charges, I give this, which happened some years ago. A lady, named Watkin, came to my shop, saying she had heard a good report of me, and intended to bestow her patronage, giving me at the same time a prescription for a single powder of three ingredients, hydr. c. creta and p. rhei, being two of them to make up. I dispensed it, copied and registered her prescription, and sent both, with envelope, etc., by her order, to her residence, charging 3*d*. The next day Miss W. called, and in perfectly grammatical and perhaps elegant (?) language abused me for imposing upon her, asserting that as "I only sent a little paltry boy a few yards, I must have uncommon assurance to charge her 3*d*. for one powder, when Messrs. — and — had sent their man with it more than half a mile for a charge of 2*d*." I never saw her again. I desire to add that I treated the story with contempt at the time, and never believed it.

Within the last eighteen months a 4-ounce bottle was brought to me to be filled with laudanum for a shilling, as the party—tenanting a £40 house at least—"used a great deal of it." I simply refused without stating my price, and, not hearing again from the party, must needs suppose they get it somewhere at or near that price.

Breckfield Road North, Liverpool, THOMAS LOWE.
March 20*th*, 1871.

Suicides by Carbolic Acid.—It is suggested to a correspondent who has sent us a cutting from a newspaper on this subject that 'suicide' and 'fatal accident' are not synonymous terms.

W. Lea will find recipes for Brilliantine on p. 437 in the present volume.

W. B. Orton and *J. L. Roberts*.—As the advertiser did not ask for a chemists' assistant to perform the duties in question, we do not see that there is any ground for complaint.

G. W. (Horncastle).—A pocket lens may be obtained from any optician.

"*Herbarius*."—Cooke's 'Manual of Botanic Terms,' published by Hardwicke, Piccadilly, would meet your requirements and give you the other information you ask for.

F. R. W.—No licence would be required to make orange wine if used for vin. quinæ by the pharmacist who makes it. The orange wine, however, cannot be made and sold as such.

W. B. B., a Junior.—Pil. saponis co. was certainly intended, and not a pill containing two grains of opium.

A. W. V. has omitted to send his name and address.

J. Brough.—See "Colours for Carboys," *ante*, p. 516. We cannot give recipes for sauces; try Cooley, Beasley, or the 'Dictionary of Daily Wants.'

J. S. Harvey.—Ol. laurocerasi is very rarely met with, and is very poisonous, containing 5 per cent. of hydrocyanic acid. It would be an expensive remedy. Try infus. quassiæ.

E. K. Campbell.—We are not aware of the existence of "scientific poisoners," and therefore cannot give you any information as to the poisonous gases they may be in the habit of using.

J. Lewis (Swansea).—The loss amounts to about 23 per cent. by volume.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. G. F. Naldrett, Mr. G. Oldham, Mr. J. Smith, Mr. Fairlie, Mr. F. Johnson, Mr. M. C. Cooke, S. R., B. H. H., A. P. S., W. B. B., C. S., S. T., "A Country Chemist," "Delta," "Beta," "A Nervous Student."

THE CHEMICAL NOMENCLATURE OF THE PHARMACOPŒIA,

WITH SUGGESTIONS FOR ITS REVISION.*

BY PROFESSOR ATTFIELD.

The vocabulary of technical terms, or nomenclature, of a pharmacopœia is chemical, botanical, zoological and galenical. In the following paper chemical nomenclature is alone considered.

Introductory remarks.—The chemical nomenclature of the current Pharmacopœias is mainly scientific, founded on theory, and therefore liable to change. Its one great fault, in relation to medicine and pharmacy, is mutability. A fault, and a great fault, because the life and health of people are largely dependent on the perfect understanding which should always subsist between physician and pharmacist respecting names of medicines which the former prescribes and the latter prepares. But it is a fault which cannot altogether be avoided. For a name is seldom given haphazard; it is commonly designed to express our ideas regarding a thing or substance, and as those ideas are developed and extended, our point of view or theory respecting them necessarily changes; the old name is no longer consistent with our knowledge, and must therefore be also changed. Moreover, there is a limit to the power of language, and desirable as may be a system of names for remedial agents which shall be fixed, abiding, permanent, the production of such a system in the present state of knowledge is altogether impossible. What, then, are pharmacists, medical practitioners and others to do when chemical names they have accepted on authority are, by the same authority, modified or abandoned? Within the last few years the views hitherto prevailing of the constitution of matter have undergone radical alteration, being no longer consistent with ascertained truths, and the nomenclature or language embodying those views has, of course, shared the fate of the theories. Under these circumstances, by what principles are we to be guided in adopting for medicine, pharmacy and the Pharmacopœia, such names as, on the one hand, shall be perfectly explicit, readily understood, unambiguous; and, on the other, consistent, or at least harmonious with prevailing chemical theories as expressed in the educational literature of the science? For not only is it to be remembered that changes must be expected in pharmacopœial names because we have already adopted and employ a nomenclature which, in the nature of things, is liable to change; but we must bear in mind that the successors to men now in practice are learning chemistry by aid of the new hypotheses, and their progress is impeded by old forms of language and by the erroneous notions which that language imparts. This state of things cannot continue; the march of science has ever been aided, never hindered by medicine or pharmacy. But what position are we to take in respect to this subject? The question is one that demands careful attention. I have endeavoured to answer it myself, and now venture to give to others the train of thought I have followed, and the conclusions at which I have arrived.

Outline of the paper.—I intend, firstly, to outline the history and present position of the chemical names already employed in Pharmacopœias, especially the British, and to glance at the causes of the recent revolution in chemical nomenclature; and to do so, not by way of aiding the followers of medicine to criticize matters purely chemical, but to enable them to arrive at sound conclusions respecting the application of modern chemical nomenclature to pharmacy. I shall then shortly allude to chemical notation, which is inseparably connected with my subject; mention disadvantages attending alterations in chemical names; state the functions and positive or negative qualities which names should possess; give a complete list of current pharmacopœial names, with the names now proposed, and their scientific synonyms; and finally refer to names requiring special or exceptional treatment.

History and present position of the chemical names of the Pharmacopœia.—The system of nomenclature hitherto accepted from chemists by pharmacists, practitioners in medicine and the public, that which is employed in European and American pharmacopœias, was mainly devised by Lavoisier, eighty-four years ago. The fundamental principle on which it was founded was, that the name of a salt should express its composition. The many animal and vegetable substances discovered since that time (notably alkaloids and neutral crystalline principles) are designated, perhaps fortunately, by unsystematic names, names which, at all events, are not liable to change, and which may therefore be omitted from consideration in this paper. The great majority of chemical substances employed in pharmacy are such mineral salts as were known to Lavoisier, and their names were given by him on the assumption that they contained, on the one hand, an undecomposable body, generally a metal, common to a whole class of salts (the compounds of *copper*, for example), and on the other, a body, or a group of elements, also common to a number of salts (*sulphates*, for example). Soda, potash, lime, baryta, magnesia and alumina were then considered to be elements; hence, as I shall further show presently, such names as carbonate of soda, nitrate of potash and sulphate of baryta were perfectly consistent with those of carbonate of iron, nitrate of mercury, sulphate of copper. During the twenty years succeeding 1787, Lavoisier's views of the constitution of salts and the language or nomenclature in which those views found expression, were generally accepted throughout Europe. Green vitriol, blue vitriol, Glauber's salt and gypsum, for example, were considered to contain, on the one hand, the "elements" iron, copper, soda, and lime respectively, and, on the other, a group of elements common to each of the four compounds; the four different elements were indicated in the spoken and written nomenclature of the compounds by their four names, 'iron, copper, soda, lime,' while the one group and its presence in each of the four compounds was indicated in the spoken and written nomenclature of the compounds by the word 'sulphate'; sulphate of iron, sulphate of copper, sulphate of soda, sulphate of lime. This change from such trivial names as green vitriol, blue vitriol, Glauber's salt and gypsum to the systematic chemical names sulphate of iron, sulphate of copper, sulphate of soda, sulphate of lime, seems to have been effected without much opposition. At that time comparatively few persons were interested in, or affected by the matter, and radical changes of this kind are made with less difficulty by the few than

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, April 5, 1871.

the many. Afterwards it was felt that the multiplication of chemical substances by discovery rendered adherence to a trivial and arbitrary nomenclature impossible, and the adoption of Lavoisier's scientific plan imperative. Lavoisier got the world out of a difficulty, not placed it in one, when he introduced the principle of scientific nomenclature.

Up to 1807 no necessity arose for interfering with the nomenclature of Lavoisier; but in that and the following year Davy made his brilliant researches on the alkalies and alkaline earths, discovered that potash, soda, baryta, strontia and lime were not elements, as previously had been supposed, but that the true basylous radicals of the so-called compounds of potash, soda, baryta, strontia and lime were metals—to which were given the names potassium, sodium, barium, strontium and calcium. Thenceforward the old names potash, soda, baryta, strontia, lime, were used to designate the oxides of the new metals. Then at once there arose a dilemma in regard to nomenclature. The names of all the salts of Davy's metals were no longer consistent with the names of the salts of all other metals. While on the one hand the names 'sulphate of copper' and 'sulphate of iron' distinctly expressed the compounds formed by the union of metallic 'copper' or metallic 'iron' with a common acidulous group of elements, represented by the word 'sulphate,' the names 'sulphate of soda' and 'sulphate of lime' as distinctly expressed compounds formed by the union of oxide of sodium and oxide of calcium with a common acidulous radical still indicated by the word 'sulphate,' but not having the same composition as (having less oxygen than) the similar acidulous radical united with the copper and the iron. It was felt that either such words as sulphate, nitrate and carbonate must each have two significations, and the salts of the alkalies and alkaline earths be considered as compounds of oxides of metals, and all other salts (sulphate of iron, etc.) as compounds of metals, or such words (sulphate, nitrate, carbonate, etc.) must have a common (though an altered) signification, and all oxygen salts be considered as compounds of oxides of metals. Davy, supported afterwards by Dulong, Clark, Graham, Liebig and Daniell, suggested that *all* metallic salts were composed of metal alone on the basylous side, and a distinct radical on the acidulous side. Unfortunately, however, accurate knowledge of constitution was included in this idea; even definite names being proposed for the said acidulous radicals. Thus blue vitriol was termed oxysulphionide of copper (Daniell), sulphatoxide of copper (Graham) and sulphanide of copper (Otto). Many other objections to the theory arose, and hence salts came to be regarded as compounds of oxides of metals with certain acidulous radicals (now known as anhydrides). But the followers of applied chemistry never took kindly to the nomenclature; such names as sulphate of oxide of iron, nitrate of oxide of silver, acetate of oxide of lead, got shortened to sulphate of iron, nitrate of silver, acetate of lead; a matter of no great moment to any one who had become a chemist, but of considerable importance to every one learning to be a chemist. The names acetate of lead, iodide of lead, etc., logically planted in the mind the impression that the compounds were formed of lead with the radical of acetates and lead with the radical of iodides,—a natural idea, which had to be unlearned, and by considerable effort of memory a mere conventional one put in its place, namely, that certain acidulous radicals (iodine, sulphur, etc.) combined with metals, while certain others (anhydrides, formerly called acids) with oxides of metals. Again, that a yellow granular precipitate, caused by the addition of perchloride of platinum to a liquid sometimes indicated potassium and sometimes potash, or that a certain black coloration sometimes indicated lead and sometimes oxide of lead, were illogical statements against which the mind naturally rebelled. It is true an explanation was afforded of such anomalies by the assumption that even haloid salts (such as iodide of potassium) on dissolving in water became true salts of oxides of metals (hydriodate of potash); but weighty arguments were adducible against this hypothesis. In short, no theory of the constitution of salts was offered, or has yet been offered, which satisfactorily explains and harmonizes all known facts respecting salts. Hence, when a very few years ago chemists were led by irresistible arguments and stubborn facts to double many of the old atomic weights, an opportunity of abandoning existing constitutional theories then presented itself, and was by common consent accepted. The exertions of Dumas, Laurent and Gerhardt bore fruit. The dualistic idea of salts being formed of an acidulous radical with the oxide of a metal, and the not less binary notion of their being composed of a distinct acidulous radical united with a metal, were renounced, and hypothesis altogether rejected, or, at all events, restricted to the idea of *oneness*. These views were, of course, accompanied by a commensurate alteration in chemical notation and nomenclature. Blue vitriol no longer being considered to be the sulphate of the oxide of copper, as shown in the formula $Cu\,O, S\,O_3$, nor even to have the binary constitution implied in the formula $Cu, S\,O_4$, but to be a structure *per se*, or, at least, one whose detail of constitution was unknown,—it became necessary to devise for it and all such salts, a notation and nomenclature which should be consistent with the unitary idea. Strictly speaking, this was impossible. The relationship, nay, the absolute identity of the constituent radicals in whole classes of salts demanded fair representation in notation and nomenclature, a result fatal to pure unitary ideas. Thus, the unquestioned relationship of the cupreous compounds to each other demanded the employment of the word 'copper' in their names and the symbol Cu in their formulæ; while the unquestioned relationship of salts containing the elements which occur in the non-cupreous portion of blue vitriol demanded the employment of the word "sulphate" in their names and the symbols $S\,O_4$ in their formulæ, and with the employment of such names and such formulæ the binary idea is difficult to repress. At the same time all are agreed that the unqualified assumption of knowledge of chemical constitution involved in the old binary theories is wrong, hence professedly binary systems of notation and nomenclature must be relinquished; the names sulphate of oxide of copper, with its formula $Cu\,O, S\,O_3$, and sulphate of oxide of magnesium (or sulphate of magnesia), with its formula $Mg\,O, S\,O_3$, must be given up for sulphate of copper $Cu\,S\,O_4$ (or copper sulphate or cupric sulphate), and sulphate of magnesium $Mg\,S\,O_4$ (or magnesium sulphate). Such names and formulæ sufficiently exhibit unquestioned relationships, while they include the least possible amount of theory.

Chemical Notation.—I would offer a few additional sentences respecting chemical notation. All teachers of chemistry, including the authors of nearly every modern manual, with remarkable unanimity have relinquished the old system of notation, that which was exclusively employed in the British Pharmacopœia of 1864, and have, to a greater or less extent, adopted the new. In the present (1867) Pharmacopœia the new notation is represented by formulæ printed in Egyptian type (**KNO_3**), the old by formulæ in Roman (KO,NO_5); a course suggested by the unsettled condition of the subject at the time this Pharmacopœia was published. It is to be expected that the next British Pharmacopœia—still "representing accurately, yet with caution, the advancement made in chemistry and pharmacy" (*vide* Preface), and reflecting the settled practice of scientific chemists—will employ the usual chemical symbols as expressive of the new atomic weights ($O = 16$) to the exclusion of the old ($O = 8$), and will altogether discard the hypothesis of the constitution of salts involved in such formulæ as KO,NO_5, or (accepting the new atomic weights) K_2O,N_2O_5, using only the less theoretical formulæ (*e.g.* KNO_3) which are now employed by the majority of teachers. The following formulæ will further illustrate what has just been stated:—

Old and New Chemical Formulæ.

	Old atomic weights and dualistic hypothesis.	Old atomic weights and binary hypothesis.	New atomic weights with dualistic hypothesis.	New atomic weights with binary hypothesis.	New atomic weights with unitary hypothesis.
Nitre	KO,NO_5	K,NO_6	K_2O,N_2O_5	K,NO_3	KNO_3
Pearlash (anhydrous) . . .	KO,CO_2	K,CO_3	K_2O,CO_2	K_2,CO_3	K_2CO_3
Epsom salt (anhydrous) . .	MgO,SO_3	Mg,SO_4	MgO,SO_3	Mg,SO_4	$MgSO_4$
Corrosive sublimate	$HgCl$	$HgCl$	$HgCl_2$	$HgCl_2$	$HgCl_2$

Old atomic weights . . . . K, 39; Mg, 12; Hg, 100; N, 14; O, 8; C, 6; S, 16; Cl, 35·5.
New atomic weights . . . . K, 39; Mg, 24; Hg, 200; N, 14; O, 16; C, 12; S, 32; Cl, 35·5.

Little more need be said in favour of the exclusive employment of modern chemical notation in future British Pharmacopœias. Arguments for or against the atomic and other theories and hypotheses concerning the constitution of salts on which this notation is based would be out of place in this paper. The old system is given up by chemists; the new is already officially recognized by the Council under whose authority the Pharmacopœia is issued, and by the various examining Boards,* and is adopted in educational works on chemistry.

These are sufficient reasons for justifying us in the expectation of seeing the new notation, if any, alone employed in the third British Pharmacopœia. This much on chemical notation it was desirable to state; for it is inseparably connected with the chemical nomenclature of a Pharmacopœia. Indeed, notation and nomenclature should obviously harmonize, seeing that they are simply different methods of expressing the thoughts and wants of everybody respecting chemical substances. Formulæ are more comprehensive than names, and convey to the mind far more information, but they are intelligible only to the educated chemist. Names comprise less knowledge, but are more or less understood by all and suffice for general purposes. To formulæ, however, we look to ascertain the views of chemists concerning the constitution of chemical compounds, and it is on these views that chemical nomenclature is founded.

Disadvantages attending alterations in Nomenclature.—Thus far have I endeavoured to outline the progress of chemistry in those directions which affect chemical nomenclature, those which suggest modification in the chemical names of pharmacopœial substances. Such names as nitrate of potash and sulphate of magnesia are unwarrantably theoretic and not now current in chemical literature. How can these and similar names be modified, and to what extent must modification be carried? Before answering the question and proposing a modified system of nomenclature, I would allude to (*a*) the alteration of chemical names as involving disadvantages, and (*b*) the properties of names. The disadvantages are obvious, unquestionable, and to be avoided whenever practicable. Scientific chemists, those with whom originate new discoveries of specific and generic truths, meet with these difficulties to a very small extent. Modification and extension of mental views respecting the constitution of chemical compounds are necessarily accompanied by modification and extension of the language in which those views are expressed; hence alterations in chemical nomenclature are naturally met with in the original memoirs recording new discoveries. Indeed, altered nomenclature is advantageous, rather than the opposite, while confined to the literature of original research, for it assists the mind in comprehending new truths. But such restriction is only possible for a time. Each additional discovery, whether relating to old substances or new, gives additional impetus to the ever-advancing waves of knowledge until the old landmarks have to be removed or relinquished, and reconstruction becomes inevitable. Here commence difficulties; for while alteration in language is easy and convenient to followers of pure science, because a natural consequence of altered mental views, it is excessively troublesome and inconvenient to the followers of applied science, who have to entertain the alterations first and the reasons afterwards.

More than this, most serious consequences have sometimes resulted to patients from one medicine

* Extracts from Letters to the Author.

Royal College of Physicians, London. "I am instructed to say that the Examiners here accept either notation. While themselves adopting the new, they are unwilling to jeopardize the chances of those who have been educated and accustomed to the old."—Henry Moody, Secretary.

Royal College of Surgeons, London. "Only in the Preliminary Examination is chemistry included. The new system of notation is adopted by the Examiners."—Edward Trimmer, Secretary.

The Society for Apothecaries, London. "Candidates are allowed to use the old or the new notation, according as they have been instructed."—R. H. Robertson, Secretary.

The Pharmaceutical Society of Great Britain. "The *new* notation is recognized by the Board, but candidates having an imperfect knowledge of this system are not rejected if they possess a sufficient acquaintance with the *old* notation."—Elias Bremridge, Secretary.

being substituted for another, solely through variation in nomenclature. But I need say nothing further on this head; it has already been adverted to at the commencement of this paper, and has been fully and ably treated, either specially or incidentally, by the following writers on pharmacopœial nomenclature:—

PHARMACEUTICAL JOURNAL: Jacob Bell, Dr. Paris, Dr. Pereira, Vol. II., 1st Ser., pp. 369–374; Mr. E. Thompson, Vol. VIII., 1st. Ser., p. 3; Mr. A. F. Haselden, Vol. I., 2nd Ser., p. 112; "C. W. M." and the well-known initials "C. W. Q.," Vol. III., 2nd Ser., p. 335; Professor Redwood, Vol. VI., 2nd Ser., p. 566; in Vol. VII., 2nd Ser., "On the Vegetable Drugs," by Mr. Daniel Hanbury, p. 96; Mr. Henry Deane, p. 101; Mr. Proctor, p. 381; Mr. T. Lowe, p. 409; Mr. J. C. Brough, Vol. VIII., 2nd Ser., p. 214; Mr. J. C. Wilson, Vol. IX., 2nd Ser., p. 363.

Properties of Names.—The names of pharmacopœial chemicals should fulfil certain functions or possess definite qualities, positive or negative, namely,—

1. The name should, as far as possible and practicable, indicate composition. This Lavoisierian principle is, as I have already shown, one of necessity as well as expediency.

2. One name should be associated with only one substance; but the converse I would by no means urge, namely, that one substance should be known by only one name, synonyms being useful both from a theoretical and a practical point of view.

3. A name, even if fallen out of use, should not be transferred to a substance having properties different from the original substance.

4. The name of an official chemical substance, that is, a name officially recognized in national pharmacopœias, should possess the minimum of instability. This quality is most important. Verbal changes of almost any kind are unpopular; changes in chemical nomenclature have done much to retard the progress of chemistry amongst the people; but changes in the names of pharmacopœial chemicals are objectionable in the interests of medical practitioners, their patients and pharmacists.

The free employment of Latin and Greek numerals in a chemical name was strongly advocated by the late Professor Miller. But though highly useful in general chemical literature for indicating details of composition, the principle is too dependent on hypothesis respecting atomic values and weights, and too susceptible of disturbance caused by new discoveries to possess the element of permanence; hence it must be avoided in pharmaceutical chemistry.

5. A pharmacopœial name should admit of being either easily spoken or written, both in the full and in the contracted form, in modern languages and in Latin.

6. When close resemblance between two salts is indicated by identity in all but one of the syllables of their names, that syllable should be at the commencement of the names and not at the end, where it would be liable to be omitted by a prescriber. Indeed, such variations are often indicated with most usefulness by a separate word altogether, confusion and even mischief being thereby avoided. Thus, for calomel and corrosive sublimate the names *subchloride of mercury* and *perchloride of mercury* are greatly to be preferred to *mercurous chloride* and *mercuric chloride;* for a physician, in writing a prescription, would contract the former to *hydr. subchlor.* and *hydr. perchlor.*, which are still sufficiently distinctive, while the others would *both* be liable to be contracted to *hyd. chlor.*, and a patient perhaps be killed by corrosive sublimate instead of cured by calomel. So *green iodide of mercury* and *red iodide of mercury* are better than *mercurous iodide* and *mercuric iodide*, or *green sulphate of iron* and *persulphate of iron* to *ferrous sulphate* and *ferric sulphate;* any greater precision that may be desired being given by chemical formulæ.

7. A name should not be changed for mere purpose of euphony, real or fancied; thus, chlorhydric for hydrochloric.

8. Names of pharmacopœial chemicals should be consistent with each other.

9. The chemical names employed in pharmacy should be consistent with those used in other branches of applied chemistry, and with the language of scientific chemistry and general chemical literature. I say consistent, certainly not identical. *For I believe the time has come when, by making a few slight alterations in the terminations of a few of our chemical names, we shall have a system of pharmaceutical nomenclature which, while perfectly harmonious with, is quite independent of, scientific chemical nomenclature, and which therefore contains greater elements of permanence than any yet adopted.* These alterations, be it noted, are in the terminations of the names only; hence the contracted names almost universally used by physicians and pharmacists would in no way be interfered with,—an argument which, if somewhat left-handed, must be admitted to be one of great strength.

(*To be continued.*)

A DISINFECTING APPARATUS.

BY A. W. GERRARD.

This little machine is intended to supersede the clumsy and inconvenient method recently proposed for the elimination of carbolic acid vapour and sulphurous acid gas, by means of heated fire-shovels, warming-pans, saucepans, etc. Its parts consist of

the body, which is about the size of a quart measure, its sides being fine wire gauze; it has likewise a lid of the same material. In the interior is a spirit-lamp, and two tin pans, one for the reception of sulphur, the other for carbolic acid.

The method of using it with sulphur is to place one of the pans, containing some of that article, upon the rests provided for it, and ignite; the fumes will readily diffuse themselves. The combustion of this substance is accelerated if the spirit-lamp or a night-light is burnt beneath it.

Carbolic acid can be used in the same manner as sulphur, but either the lamp or a night-light must be burnt; it is best applied in the undiluted form.

The advantages of this apparatus are, that it does away with the necessity of sprinkling, and causes a more general diffusion of vapour, thus attacking the floating germs and purifying the atmosphere. It can be placed between bedding with perfect safety, and there is no occasion for the patient's removal while this is being done. It is well suited for deodorizing rooms, closets, hospitals, vehicles, and all purposes for which disinfection is required, being clean, simple, and efficient in its action.

Another use to which it may be applied is that of a child's food warmer. If a night-light be lit and placed in the interior, a tea-saucer or other vessel containing the food, placed over it, will keep warm until the light has burnt out.

MORPHIOMETRIC METHODS COMPARED.

BY WILLIAM PROCTER, JUN.

The question, "What is the best process for assaying opium to determine its morphia strength, suited for adoption into the United States Pharmacopœia?" was accepted by the writer at the Chicago meeting.

Reflection on the query suggests that it is not so much what is the best analytical process, as to decide what process is best suited for practical use by druggists and pharmaceutists in determining the morphia value of opium for the purposes of the Pharmacopœia. Those who take the view that the process should embody the nicest and most refined manipulations of the analytical laboratory, may not accept this view; but when it is understood that a large majority of the persons needing its use are not analytical chemists, it is believed that simplicity, united to a fair degree of accuracy, is more available than extreme accuracy, beyond the reach of most apothecaries, applied in a complex process.

So many able chemists have published processes, some of which are well known in connection with their names,—as Staples' process, Mohr's, Guillermond's, etc.,—that the ground would appear to be well examined. The process of Staples is that of the United States Pharmacopœia. Its point is in the employment of alcohol to retain the colouring matter in solution during the precipitation of the morphia, and in mixing the ammoniacal precipitant also with alcohol. The process of Mohr avails itself of the selective power of boiling lime-water to reject narcotina and retain morphia in solution. Both of these processes extract the opium with cold water. Guillermond's process employs alcohol of 71 per cent. to extract the opium, which is then precipitated by ammonia. The precipitate, as in Staples' process, contains narcotina.

One difficulty in extracting the portion of opium soluble in water is the caoutchoucoid matter which tends to resist its solvent action. The idea of employing benzine, or light coal oil, to remove this as well as the free narcotina, has been suggested by Albert E. Ebert for another purpose, and has been used by Dr. Flückiger in his examination of opium. It is believed that the preliminary use of this solvent in opium assays may be usefully adopted.

Believing that the best way to arrive at a solution of the query was to try several processes with the same solution of opium, a sample of nearly dry opium, weighing 300 grains, was triturated to coarse powder, and then rubbed with repeated portions of water until finely divided, and macerated in six times its weight of water for twelve hours, then percolated on a filter until the washings were nearly colourless. The united liquids (amounting to 4500 grains) were divided into three equal portions, each representing 100 grains of opium.

No. 1.—The solution was evaporated with moderate heat to half a fluid ounce, mixed with an equal bulk of alcohol (sp. gr. 835), filtered through a small filter, and the latter washed with a little diluted alcohol. 50 minims of solution of ammonia (sp. gr. 960) was mixed with 2 fluid drachms of alcohol. One-half of this was added to the alcoholic solution of opium with agitation, and allowed to stand six hours, when the remainder of the ammonia was mixed in, and the vessel permitted to rest for twenty-four hours. The crystalline matter deposited on the interior of the vial being detached, the contents were at intervals poured on a small tared filter, and the crude morphia washed, first with diluted alcohol and then with water, dried at 120°, and weighed. The product was 9·75 grains. This was treated several times with boiling non-alcoholic ether, and the ethereal solution, evaporated in a small tared capsule, gave 0·31 grain of crystalline prisms, equivalent to 0·31 per cent. of narcotina, and 9·44 per cent. of morphia in the opium examined.

No. 2.—This portion was treated with solution of subacetate of lead till it ceased to be precipitated, the precipitate separated on a filter and well washed, the filtrate treated with diluted sulphuric acid by drops to separate the excess of lead as sulphate, and filtered. The clear solution by moderate heat is reduced to half a fluid ounce, mixed with its bulk of alcohol, filtered, and the filtrate mixed with 50 grains of solution of ammonia containing alcohol, in two portions added half an hour apart, and allowed to stand twenty-four hours. The morphia was deposited in large distinct crystals, very few of which were attached to the interior of the vessel. They were collected on a filter, washed with diluted alcohol and water, dried, and weighed 8·75 grains. This, repeatedly boiled in ether and the ethereal liquids evaporated, afforded but a trace of crystalline matter, too small to weigh and yet distinctly visible in minute prisms.

No. 3.—This was mixed with 60 grains of lime, previously hydrated and boiled for fifteen minutes, the decoction filtered hot from the dregs, and these well washed with hot water. The filtrate, slightly acidulated with muriatic acid, was evaporated to half a fluid ounce, mixed with its bulk of alcohol and filtered; an excess of alcoholic ammonia was added and mixed, and the vessel set aside for twenty-four hours. The coloured crystalline powder and the portion attached as a crust to the interior were carefully collected on a filter, washed, dried and weighed, affording 10 grains of impure morphia, more coloured than either of the other results.

The use of alcohol in this process is intended to retain the colouring matter, yet did not succeed in producing a light-coloured morphia.

The last result, according to Mohr, should contain no narcotina, yet, when boiled to exhaustion in ether deprived of alcohol, the ethereal liquid afforded 0·75 grain of narcotina, making the result of morphia 9·25 per cent., and narcotina 0·75 per cent.

It will appear, by a comparison of these results, that the Staples' process, whilst less complicated than either of the others, yields a purer product than the Mohr process, and a slightly larger yield of morphia; whilst the process No. 2, which is suggested by the writer, affords the purest and best crystallized morphia, but is more complicated than either of the others. Hence it is the first, or Staples' process that is to be preferred, modified by treating the powdered opium with warm benzine as a preliminary operation. The final success is greatly aided by conducting the evaporation of the liquor at a moderate temperature, which renders the product less contaminated with colouring matter. By reducing the bulk before precipitation to the extent noted above, the precipitation of the morphia is facilitated, whilst the crystals are equally light-coloured. By using benzine beforehand, the extraction of the opium will be more thoroughly accomplished.—*Amer. Journ. Pharm., from the Proc. Amer. Pharm. Assoc.* 1870.

THE HONEY TRADE OF THE UNITED STATES, DOMESTIC AND FOREIGN.

BY B. F. STACY, CHARLESTOWN, MASS.

This article, which twenty-five years ago formed quite an insignificant article of trade in this country, is rapidly increasing year after year in domestic production; whilst the amount imported is growing smaller. While less is used for pharmaceutical purposes, it nevertheless is rapidly increasing in domestic use. It is also used largely by confectioners, and is an ingredient of many of the fancy beers which have recently become in vogue. Some dealers maintain that the honey which is the product of a cold climate is vastly superior to that of warmer latitudes, which seems almost a contradiction to nature, as Southern lands teem with flowers far excelling as a base of supplies to the bees. One sample that the writer saw from Canada excelled all others in whiteness, clearness and density. Samples from New York, Minnesota, Vermont and New Hampshire ranked next in order. The only way to obtain pure honey is to buy it in the comb, as nearly all the strained honey sold in the market bears unmistakable evidence of adulteration; this is, however, so well known and so easily discovered that it is unnecessary for me to dwell on it, and as the adulteration is mostly sugar and occasionally a little starch, to give it a whitish appearance, it is at least *harmless;* would that all the adulterations now in use were equally so. Out of ten samples purchased of different dealers, eight of them gave plain evidence of having been tampered with, the remaining two being samples from Cuba, right from the custom-house.

"In 1860 the total product of honey of the United States, reported, was 23,366,357 lb." "New York stood at the head of the list, with 2,369,751 lb., followed in order by North Carolina, 2,055,969 lb.; Kentucky, 1,768,692 lb.; Missouri, 1,585,983 lb.; Tennessee, 1,519,390 lb.; Ohio, 1,459,601 lb.; Virginia, 1,431,591 lb.; Pennsylvania, 1,402,128 lb.; Illinois, 1,346,803 lb.; and Indiana, 1,224,489 lb.; all other States falling below 1,000,000 lb." "Since the census of 1860 the statistics obtained have been partial and fragmentary; the statistics of Massachusetts for 1865 showed an increase of 26 per cent., and that of Iowa for same year an increase of 22 per cent. over the figures of 1860." "In the winter of 1868–69 the Department of Agriculture sent out circulars to known apiarians in most of the States, and received returns from 489 counties in 32 states. The aggregate number of hives reported was 722,385." "Estimating for counties not reporting, and and making due allowance for the fact that many of the counties reporting were giving special attention to bee culture, 2,000,000 of hives were deemed as low a figure as the returns would warrant. Allowing 15lb. of surplus honey to the hive (about two-thirds of the average reported), the total product in 1868 would be 30,000,000 pounds, which at an average valuation of 22½ cents per pound, would give $6,750,000." "In 1868 the quantity of honey imported was 212,176 gallons; value, $117,172; of which 90,452 gallons, value $50,569, were re-exported. A very small quantity of domestic honey was exported the same year. These figures show conclusively that an immense trade in honey has been built up in this country and is constantly increasing, which will eventually supersede all necessity of the importation of any from the West Indies." A small township in Minnesota reports 262 hives; from these hives 2826 pounds of surplus honey was taken in the season of 1869. When we consider that the cost of production is merely nominal, it will be seen that it pays to keep bees.

The writer respectfully acknowledges his indebtedness to the Commission of Agriculture for the statistical information.—*American Journal of Pharmacy, from the Proceedings of the American Pharmaceutical Association,* 1870.

NOTE ON CONFECTION OF SENNA.

BY JOHN W. EHRMAN.

This preparation, when properly made, is an excellent laxative—for habitual constipation superior, perhaps, to any other remedy. It is not in such general use among physicians or the public as it is entitled to, and this probably arises from the fact that much of the confection of senna of the market has little or no resemblance to the officinal article, and is comparatively worthless. Pharmaceutically considered the officinal process yields a result which is unobjectionable, save in two particulars; first, the presence of the powders of senna and coriander (and especially of the latter, which is most difficult to prepare) imparts a degree of "grittiness" which is disagreeable to the patient, giving the impression that "dirt" is present; secondly, the consistence of the confection when evaporated to the specified weight, varies as prepared from different specimens of drugs, and is sometimes too thin, when the mass is apt to go into fermentation. Fortunately, these defects may be easily remedied. In our opinion, the purging cassia, considering that it is so difficult to obtain, might well be omitted and substituted by an additional quantity of senna, particularly as there can be no advantage in multiplying the number of substances having similar therapeutical properties, in this or other preparations. We have used the modified formula given below (the coriander also being omitted and substituted by ginger), which is free from the objections we have mentioned. It is much more agreeable to take than the officinal confection, and is equally efficient:—

Take of Tamarinds	20	parts.
Figs, bruised	20	„
Prunes, sliced	15	„
Fluid Extract of Senna	10	„
„ „ Ginger	1	„
Sugar	30	„
Water, a sufficient quantity.		

Digest in a close vessel, by means of a water bath, the tamarinds, figs and prunes in ten parts of water for three hours; separate the coarser portions with the hands, and press the pulpy mass by rubbing, first through a coarse sieve, and then through a very fine one. Mix the residue with four parts of water, and, having digested the mixture for a short time, treat it as before, and add the product to the pulpy liquid first obtained, evaporate to a syrupy consistence over a water bath, add the sugar and continue the heat for twenty minutes, or until the sugar is dissolved; then remove from the bath, add the fluid extracts of senna and ginger, and mix thoroughly.—*The Chicago (U.S.) Pharmacist.*

SUMBULUS MOSCHATUS.

Inspector Lungershausen, of Moscow, reports in No. 27 of *Wochenschr. f. Gärtnerei und Pflanzenkunde*, that the hitherto unknown plant yielding musk, or sumbul root, is now in bloom in the botanical garden at Moscow. When the Russians occupied Bucharia, the plant was discovered and several roots were sent to Moscow, of which but one arrived in good condition. This new umbelliferous plant it was hoped would produce fruit and thus be propagated in Europe. The root has been used in Russia with considerable success in Asiatic cholera.

Professor C. Koch regards the plant as a very interesting one, on account of the strong musk odour of its root, and because the musk deer lives in the same regions. The root has been known for about thirty-five years, without, however, sustaining the high reputation it has gained in Russia, so that it belongs already to the obsolete remedies. It is now mainly employed in perfumery in place of the high-priced musk. There may, possibly, be two musk roots, both indigenous to Central Asia, one being exported through Russia, the other from the East Indies.

The musk root contains about 9 per cent. of a soft oleoresin, obtainable by ether, which in contact with water has the odour of musk. It contains a peculiar acid, sumbulic acid, which appears to differ from angelic acid and from umbelliferone. It has been long known that the root belongs to an umbelliferous plant; flowers and fruits have sometimes been found with it. The latter differing from those of other *Umbelliferæ*, were made the type of a new genus, and the plant was named *Sumbulus moschatus.*—*Hager's Ph. Centralhalle*, 1870, Nos. 39, 367, 368.

CHINESE PRODUCTS.

In the Reports of her Majesty's Consuls in China, for 1869–1870, there are some interesting particulars respecting the production of several substances which are of interest to the drug trade.

First in interest among these stands opium. The increasing consumption of this drug is now largely met by native cultivation. The native opium is not in favour with those who have acquired a taste for the foreign drug; but it is thought that the adulteration practised in the preparation of the Indian opium for smoking, may tend eventually to make the cheap native article more popular. This adulteration is said to consist of the admixture of various kinds of vegetables, ground nuts, and sometimes even human hair. It is probable, however, that the Indian opium, from its superior qualities, will always hold its own at the point now reached as an article of luxury against the native grown. There seems little doubt that the actual consumption of opium in China is increasing; the Consul at Kiu-kiang reports that "the number of dens for the accommodation of opium smokers has considerably increased within the past few years;" while the Consul at Foo-chow-foo reports that "opium smoking is still the fashion of the elegant and wealthy classes of society in China, no matter in what rank; it is the pastime of the literary man and the mandarin, as well as of the merchant."

The following information concerning the cultivation of opium in the province of Sze-chuen, the result of personal observation and inquiries made on the spot, is given in the report of the delegates of the Shanghae Chamber of Commerce on the trade of the Upper Yang-tze:—

"Cultivation of opium is very profitable, and is, consequently, increasing everywhere. The climate of Szechuen is warm and the season early, so that at least two crops, and probably three, are taken off the ground annually. Where the poppy is grown it is the first crop of the year, and only occupies the ground three months, competing with wheat or beans or some of the other cereal crops which come to maturity in the spring. The seed is sown in the first moon, say February. It is in flower during April, and the juice is nearly all gathered by about the middle of May, when the stalks are taken up for burning. Before this, the succeeding crop has generally been sown, if it is a dry crop, such as Indian corn, tobacco or corn, and the green leaves of the young crop appear as soon as the dry stalks of the poppy are cleared away. Rice may also be seen growing on the field where the poppy has been, as the means of damming up and irrigating the arable patches on the hillsides on which the poppy grows are always at hand, and the time of sowing the rice was found to correspond exactly with the time when the opium fields had been cleared. Very little labour seems to be needed in the cultivation of the poppy, and the gathering of the juice may be the work of the children of the family. The incision in the pod is made in the morning, and in the evening the juice that has oozed out is scraped off into a cup, when it gradually becomes black, and a few days' exposure to the sun renders it dry enough to be packed. The poppy seed is used for food."

For commercial purposes three kinds of opium are particularly worthy of notice, although as far as soil and climate are concerned there seems scarcely any limit to its cultivation. These are the growths of Szechuen (called Chuen-tu), Yunnan (called Nan-tu), and Kweichow (called (Kweichow-tu).

The quality and strength of the Szechuen opium varies according to the district. Fungtoo opium is said to yield 75 per cent. of extract; Foo, 70 per cent; Kai, 80 per cent., but these are vague native estimates. The opium ordinarily produced in Eastern Szechuen is from a large variety of poppy with white petals; but at Patung-hien it is obtained from a smaller kind with pink-tipped white petals, and is dearer than the other. Pink flowers are common amongst the white, and there are, doubtless, many slight differences in the quality of the drug which smokers recognize.

Yunnan is said to produce more opium than Szechuen. This opium, called Nan-tu, yields 80 per cent. of extract, is of finer quality and possesses better medicinal qualities than the Szechuen, and is longer in consuming. It is imported in large quantities into Szechuen, where it is used by wealthy people.

The Kweichow opium resembles the Szechuen. It was formerly largely imported in the latter province; but since the cultivation of the opium has extended there, the demand has fallen off.

Rhubarb is collected and sold in the Kwan-hien district. The price is about 40 taels per picul. (The tael is equal to about 6*s.*; the picul 133⅓ lb.) The finest quality is the produce of Szechuen. A distinction has usually been made between the Szechuen and the Shansi rhubarb, but it is doubtful whether it be a real one. The shipment to London during 1869 amounted to 1290 piculs, against 1910 piculs of the previous year.

Safflower, or Hung-hwa, is another valuable product of Szechuen. The best kind is called Kwa-tsze-hwa. The flowers are rolled together and cut in slices about a mace in weight, which are formed into square blocks. The second quality is called Ko-tsze-hung-hwa, and is made from the heart of the flower dried. An inferior description grows in Honan. A small trial shipment has been made to Marseilles, but the result is not known.

White wax, insect wax or pela, is also produced in Szechuen in large quantities. The insect which makes the wax is found in Yunnan on a tree, which is merely designated the Chung-shu, or insect tree. On this tree the insect forms a case containing hundreds of eggs, which is removed in the fourth moon and placed on the la-shu (wax-tree) in Szechuen. The insects come out of the case and commence secreting the wax round themselves, which operation is finished by the seventh moon, when the insect dies and the wax is collected. It bears a high market value, and is prepared at a trifling cost. The journey into Yunnan to procure the insect includes all that can be called expense or labour in the production. The insect does the rest, and the proprietors have to do little more than take the wax off the tree when it is ready; yet 500,000 taels would probably be a small estimate of the value of this wax exported annually from Szechuen. It is found also in Yunnan and Kweichow, but probably the Szechuen product is the best in quality, as it certainly is the most abundant.

The quantity of cassia has increased year by year since 1864, when the shipment was 13,800 piculs against 40,600 piculs in 1869. The export of musk, too, during 1869, was slightly in excess of that of 1868. On the contrary, the shipments of gall-nuts in 1869, amounted to not quite half the quantity of the previous years.

Sulphur is produced in considerable quantities in the hills near Yun-yang-hien, and a small quantity in Kweichow. Kweichow is also rich in mines of lead, copper, and especially of quicksilver, which latter were being worked with great advantage previously to the late rebellions, but have not since been resumed.

Tung oil is one of the largest products of Szechuen. The tung-shu tree grows everywhere throughout the province, preferring steep places with patches of good soil. The export of this article from Hankow by vessels under foreign flags was, in 1868, 174,000 piculs. Other oils are produced, as tsai-yew (cabbage or rape oil), chema-yew (tilseed oil), hwa-yew (ground-nut oil) and cha-yew (tea oil), but these are unimportant as articles of commerce.

LIME-JUICE AND PEPSINE.*

Besides pepsine and pancreatine, now much used as aids to digestion, there are certain food solvents equally worthy of attention, which have hitherto been somewhat neglected. The gastric juice, besides certain saline matters, contains a free acid and the organic substance called pepsine, both of which are secreted by a healthy stomach during a meal, and are essentially necessary for its digestion. While pepsine always constitutes the fermentive principle, the acid of the gastric fluid varies,—hydrochloric, phosphoric, lactic and acetic acids having been found therein. The gastric juice is in itself antiseptic, and this antiseptic virtue appears to depend greatly upon the acid portion. A few grains of pepsine moistened with water and submitted to a temperature of 100°, will in a short time ferment and emit a strong, almost urinous, odour. But if a few drops of hydrochloric, phosphoric or acetic acid be previously added, no such smell will be perceived. The solvent effect of certain acids upon albuminoids may be shown by coarsely bruising a small portion of meat and adding sufficient water to cover it, acidulated with either of the above-mentioned acids,—hydrochloric acid especially. If the mixture be then digested at the heat of the stomach for three or four hours, it will be found that although not reduced to such a homogeneous as it would have been by pepsina porci, nevertheless the solvent action of the acid is manifest.

In order to test the comparative digestive powers of hydrochloric acid and pepsine, Eberle suspended a solid piece of meat in a solution of each. He found that, in a few hours, the piece of meat in the pepsine solution had wholly disappeared, but the piece in the acid solution remained. Although this experiment proves that pepsine constitutes the digestive principle of the gastric juice, it does not prove that the acid is not a food solvent. Pepsine dissolves by virtue of its fermentive action. There is evidently an attracting affinity between the ferment and the albuminoid resembling chemical affinity, inasmuch as a new compound is the result. The acid, possessing no such affinity, acting on such a complex texture as a piece of meat, and that in a state of rest, could not be expected more than partially to exert its solvent action under circumstances so unfavourable to its action. But if the changes that food undergoes previous to and on entering the stomach—by mastication and by the powerful muscular action of the stomach—be taken into consideration, it will be readily perceived that it is here that the acid of the gastric juice, if it act at all as a food solvent, would be found to exercise its power. This may explain the *modus operandi* of lime-juice and other acids in curing or preventing scurvy. All the acids that have been discovered in the gastric juice are, without exception, antiscorbutics.

Dr. Farr considers that indigestion also may arise almost or quite as frequently from a want of acid as from a deficiency of pepsine in the gastric juice. He has noticed many times that where pepsine alone has failed to relieve dyspepsia, the exhibition of one of the non-astringent acids has been successful. Believing that the prophylactic virtue of lime-juice and other acids depended upon their direct action as food solvents, it occurred to him that an excellent artificial gastric juice might be made by allowing lime-juice to represent the acid portion. Accordingly he had a mixture of lime-juice and pepsine prepared, which he reports that he and many of his medical friends have used successfully in cases of dyspepsia. He says that lime-juice with either pepsine or pancreatine makes a very elegant preparation, is very convenient for prescribing, and may be made to keep almost any length of time without deterioration.

* Abstracted from a paper on "Food Solvents," by Dr. Archer Farr, published in the *Medical Times and Gazette*, March 18th, 1871.

Note on Milk-Ash.—Mr. J. A. Wanklyn writes as follows:—The statement current in the text-books that caseine is kept in solution in milk by means of alkali, with which it forms a kind of salt, cannot be correct, inasmuch as I find, on examining the ash left on incinerating milk, that there is no appreciable quantity either of alkali or of alkaline carbonate. The experiment was made on two specimens of milk, one from Hertfordshire, and the other from Essex. I evaporated down ten grammes of milk in a small platinum dish, incinerated the residue, and then moistened the ash with water, added drops of very dilute standard sulphuric acid, and observed the reaction on litmus-paper. After the addition of 0·5 cubic centimetre of standard acid, the action on litmus-paper is not alkaline; and on the addition of 1 c.c. the reaction is distinctly acid. 0·5 c.c. corresponded to $2\frac{1}{2}$ milligr. H_2SO_4. Milk-ash, if it contain any alkali at all, does not contain so much as 2 per cent. of carbonate of soda, and the ratio of alkali to caseine cannot be so large as 2 to 400.—*British Medical Journal*.

Prevention of "Pitting" in Small-pox.—The *Melia Azadirachta*, L., an Indian plant, is used by the natives to cover the bodies of patients recovering from small-pox, as it is supposed to prevent the mark from becoming permanent. Dr. Wight says of this tree that "the leaves beaten into a pulp and externally applied act like a charm in removing the most intractable form of psora and other pustular eruptions."—*Nature*.

THE PROPOSED POISON REGULATIONS.

MEETING OF CHEMISTS AND DRUGGISTS AT SHEFFIELD.

On Thursday evening, March 30th, a Meeting of Chemists and Druggists was held at the rooms of the Pharmaceutical and Chemical Association, to consider the regulations which have been proposed for adoption by the Pharmaceutical Council as to the storing, dispensing and sale of poisons.

Mr. J. T. Dobb, the President of the Association, occupied the chair, and stated that if the regulations were passed at the meeting of the Pharmaceutical Society in May, they would be sent to the Privy Council and would very soon afterwards become law. Many chemists and druggists thought the regulations were too stringent, that they would interfere with their privileges, that chemists and druggists were sufficiently well educated and qualified to dispense poisons, and that special legislation for them was not required. The subject was a most important one, and the meeting had been called in order to obtain an expression of opinion from the chemists and druggists of the town.

Mr. Wilson moved, "That this meeting regards the proposed compulsory regulations for the storing and dispensing of poisons as an unwarrantable interference with the freedom and independence of the trade, uncalled for by the public and without leading to their greater safety; and further, this meeting desires to impress upon the Council of the Pharmaceutical Society the serious personal and legal responsibility already resting upon chemists and druggists, which naturally makes them adopt the most careful precautionary measures to prevent accidents; and as every business is so varied and peculiar in its character and circumstances, each principal should remain at liberty to make such arrangements as will best suit his own case to secure safety, and therefore the proposed legislation upon the subject would be unwise, inconvenient and unnecessary; and this meeting, while recognizing with respect the Pharmaceutical Council, pledges itself to oppose energetically the proposed compulsory poison regulations."

This was seconded by Mr. Stevenson.

Mr. Preston objected to the proposed regulations, but at the same time thought some regulations were needed, and that certain regulations might be suggested which every member of the trade could agree with. He objected to the clause in the resolution—"and, therefore, any definite legislation upon the subject would be unwise, inconvenient and unnecessary"—and moved, as an amendment, the proposition with the clause omitted.

This was seconded.

Mr. Radley was opposed to the regulations, and suggested that the Pharmaceutical Society should send to every member of the trade recommendations as to poisons which they might adopt or not, as they thought fit.

This was objected to by Mr. Hudson, who considered that if they laid themselves open to receiving recommendations, the Privy Council would think the regulations were necessary.

Mr. Cubley spoke in favour of the resolution, and expressed his opinion that if the regulations were enforced, innumerable accidents with poisons would arise within twelve months after their coming into operation.

After some further discussion, at the suggestion of Mr. Cocking, Mr. Wilson consented to alter his resolution so that the words "the proposed legislation" were inserted instead of the words "any definite legislation."

Mr. Preston then withdrew his amendment, and the resolution as amended was carried unanimously.

Mr. Radley proposed, "That in the opinion of this meeting the best means to prevent accidents in the storing, dispensing and selling of poisons is the improved education of the chemists and druggists, secured by the Pharmacy Act, 1868, which will accomplish all that is required for the protection and safety of the public."

Mr. Ward seconded the motion, and after some discussion it was adopted unanimously.

Mr. Cocking moved and Mr. Preston seconded, "That partial legislation on the subject of poisons is impolitic and unjust, and that any regulations which do not apply equally to surgeons, apothecaries, veterinary surgeons, hospitals and dispensaries cannot be deemed satisfactory to this meeting."

The motion met with cordial approval; and in the course of a brief discussion upon it the Chairman expressed his opinion that some surgeons required to be looked after more than chemists and druggists, as they allowed their medicines to be dispensed by the boys who looked after their horse and carriage, who cleaned their boots, and who filled up the remainder of their time by making themselves useful about the house. The motion was unanimously adopted, as was another to the effect that the resolutions be forwarded to the Pharmaceutical Council.

A cordial vote of thanks to the Chairman concluded the proceedings.

MEETING OF CHEMISTS AND DRUGGISTS AT BIRMINGHAM.

A Meeting, convened by the Midland Counties Chemists' Association, was held, March 31st, in the Committee Room of the Temperance Hall, Temple Street, to consider the proposed new regulations with respect to the sale of poisons. The chair was taken by Mr. Arblaster, President, and there were present Messrs. Palmer, Dymond, Crookes, Miller, Sanderson, Brown, Price, Grieves, Lucas and others.

In commencing the proceedings, the Chairman said the question was one of great importance to all of them. It would be in the recollection of most present that at the meeting of the Pharmaceutical Society in May last the proposed poison regulations were the great subject of discussion. The regulations which were then submitted were negatived after very considerable discussion; but a resolution was passed in the following terms:—"That the subject be taken into consideration by the incoming Council; and that a further report be made to the next Annual Meeting." From that time—from May last till the present time—he believed the subject had continually engaged the attention of the Pharmaceutical Society, and they had again proposed regulations somewhat similar in character to those of last year; but they had tacked on a clause relating to the dispensing of liniments, embrocations and lotions in particular-shaped bottles. With that exception, the regulations were the same as before. They now stood as follows:—

"1. In the keeping of poisons, each bottle, vessel, box or package containing a poison shall be labelled with the name of the article, and also with some distinctive mark indicating that it is poison. 2. Also in the keeping of poisons, each poison shall be kept on one or other of the following systems, viz. (*a*) in a bottle or vessel tied over, capped, locked or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop or dispensary; or (*b*) in a bottle or vessel readily distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop or dispensary; or (*c*) in a bottle, vessel, box or package kept in a room or cupboard set apart for dangerous articles. 3. All liniments, embrocations and lotions containing poison shall be sent out in bottles readily distinguishable by touch from ordinary medicine bottles, and there shall also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label, giving notice that the contents of the bottle are not to be taken internally."

The arguments which had been used against the proposed regulations were many. Some said that a higher state of education would be a better safeguard. But they had continually seen that mistakes had occurred among the best educated and in the best regulated establishments, and he did not think they must look to a higher educational standard for the sole means of preventing those mistakes. Besides which, some years must necessarily elapse before that high standard of education could make itself felt among the thousands of chemists in the country. Another objection was that the surgeons and medical practitioners generally, including veterinary surgeons, were not subjected to the same regulations as were proposed by the Pharmaceutical Society; but this, he thought, was not worthy of consideration, for he was of opinion that if the sale of poisons became the subject of legislative interference, no person, surgeon or otherwise, would be allowed to retail poisons without placing himself under the regulations. Again, objections had been made to the mode of storing poisons; but this might be obviated by the adoption of a particular description of bottles, and taking care that those bottles were properly labelled and placed in a particular spot. If such things as the alkaloids, strychnine, morphia, etc. were put into a cupboard, apart from the general run of medicines, it would be the means of preventing many of the mistakes which had occurred. Looking at the correspondence which had taken place between Dr. Simon and the Pharmaceutical Society, it seemed to him that something must be done. Dr. Simon wrote to the Registrar of the Pharmaceutical Society to the following effect:—

"My Lords believe it to have been the opinion of Parliament that proper regulations in this matter are required for the protection of the public, and as more than two years have elapsed since the passing of the Act without the Pharmaceutical Society having proposed any such regulations, my Lords think it right to inquire whether the Pharmaceutical Society intends, within any time you can specify, to propose such regulations to their Lordships. They direct me, therefore, to request that you will have the goodness to give me, at your earliest convenience, the information required by their Lordships."

If that was so, if something must be done, they had far better do what they could to regulate themselves, rather than have regulations forced upon them by the Government. He had drawn up, and would submit for the consideration of the meeting, the following resolution:—

"That from the correspondence between Dr. Simon and the Council of the Pharmaceutical Society, it appears that her Majesty's Privy Council insists on regulations being framed for the vending and dispensing of poisons; and it is the opinion of this meeting that the regulations proposed (with the exception of the third) by the Pharmaceutical Society are such as will be the least objectionable to chemists, and at the same time satisfy the requirements of the Privy Council."

Several gentlemen present expressed an opinion that the regulations would be found to work very harshly upon the trade, and suggested many minor difficulties which would present themselves, especially in the poorer districts.

Mr. Dymond said he was glad of the present meeting, because he valued a free expression of opinion on a question of such importance as this. He had read with interest the reports of the various meetings which had been held throughout the country, and had been impressed, with what seemed to him, an absence of such an impartial view of the subject as would enable chemists justly to appreciate the difficulties of the question. No doubt chemists, like many other classes of the community, were mainly influenced by what was convenient to themselves in the conduct of their affairs. This was not unnatural, but they ought at the same time not to ignore what was passing, or had passed, outside their own circle. The Pharmaceutical Council, upon whom had devolved the duty of suggesting these regulations, contained men of long experience and high standing in the trade. They had, with special opportunities, watched the progress of Pharmacy Acts and legislation on poisons, and had laboured in their behalf for many years. These men knew intimately what the determination of the Government was, that it absolutely demanded regulations to be observed by chemists in the use of poisons. They saw that the press demanded it (and Mr. Reynolds was quite mistaken when he declared that only two papers had spoken on the subject), and they knew that the public approved it. These various considerations must be allowed weight in considering the question. Regulations of some kind would, no doubt, have been contained in the last Pharmacy Act had not the Privy Council, on the urgent recommendation of the Pharmaceutical Council, that *they* were the best judges of what was possible and practicable to chemists, surrendered to them the duty of framing regulations. The Pharmaceutical Council, therefore, were bound by the highest considerations of honour to suggest such regulations as they conscientiously believed to be just, as well as of value to the trade. Very little objection, indeed, had been made to the regulations themselves. It appeared that most chemists adopted them in one or more ways. What the chemists objected to was compulsion and interference. He believed the fear of interference was groundless. But subjection to law was not an evil. The whole of our liberties were based upon the restraints of law, which prevented one man from injuring another. It was illegal for one person to injure another with smoke or an offensive smell; but these were imaginary nuisances compared with that of one man poisoning another, or even with the possibility of doing so with an unprotected array of poisons. The present fact, however, before them was this,—the Government were determined that chemists should observe some regulations in the keeping and dispensing of poisons. They had now the opportunity of regulating themselves. Would they accept this golden chance, or by waiting a little longer have to submit to Government regulations with results which no one could anticipate?

The resolution was seconded by Mr. J. Lucas, who said he could see no hardship in having to comply with the regulations. For himself he did not think they were necessary; but if regulations were to be framed, he believed that those proposed were as easy as any that could be devised for the general good. There was much misconception abroad as to the sale of poisons, some persons still believing that the sale of paregoric and pennyworths of laudanum and the like, must be in particular poison-bottles, and not in bottles or vessels that their customers might bring for the articles.

No other resolution being proposed, it was submitted to the meeting, and declared to be carried by a majority of eight votes to four votes.

Some of the dissentients said that the resolution would not express the general feeling of the trade in Birmingham.

The Chairman said he had advertised the meeting in the daily newspapers, and had sent out 120 post cards of invitation. Those who were absent could not find fault, and he thought they would be right in assuming that many of them were satisfied with the regulations.

The proceedings terminated with a vote of thanks to the Chairman.

The Pharmaceutical Journal.

SATURDAY, APRIL 8, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE LAST STEP IN POISON REGULATION.

BETWEEN the Scylla and Charybdis of displeasing the governing body of our Society and of becoming obnoxious to the reproach that we do not purvey information with such promptitude as befits this age of progress, we are irresistibly impelled to commit what may be deemed a breach of the regulations with which we ought to comply. But as the occasion is one that we may fairly term exceptional, we trust that the balance of opinion will be in favour of our disobedience,—since the majority of our members, as well as the great body of the trade, must be anxious to hear of anything taking place in reference to a question that interests them so profoundly as that of poison regulations.

We understand that in the Council Meeting of last Wednesday, Mr. SUTTON's motion that the sense of the members be taken on the question at issue, was followed up by an amendment, proposed by Mr. DYMOND, to the effect that the Council perceiving the opinion entertained by members of the Society to be so decidedly antagonistic to the application of compulsory regulations, should, therefore, suggest the issue of the proposed regulations simply as recommended by the Society. This amendment was put to the vote and carried with only one dissentient vote—that of the PRESIDENT.

We may at least congratulate our readers that the question which has for months agitated our Society and the entire trade is thus finally disposed of. There is no longer any ground for hostility. We trust that we may also, by anticipation, congratulate them on the removal of all reason for future antagonism between town and country, and on the possibility of provincial and metropolitan energies being hereafter united to promote the general interest of pharmacy rather than directed to hostile efforts.

We have now learnt to appreciate the power of the country members, and may therefore take this opportunity to urge upon them not to neglect its exercise in all matters which affect the advancement of the trade.

And though last, not least, we would most sincerely express our regret that the attainment of the result we now record involves a loss which it may be long before the Society can make good—we refer to the resignation of the Presidency by Mr. SANDFORD, which followed immediately on the carrying of Mr. DYMOND's amendment. Mr. SANDFORD's labours for the good of pharmacy are far too well known and appreciated by the trade to need any reiteration here, and we feel confident that few will hear of his resignation without profound regret that his strong sense of duty has rendered it impossible for him to be any longer the leader and representative of British pharmacists.

MEDICAL DRUGGISTS.

WE commend to the consideration of our medical contemporaries the state of things described in Dr. CAMPBELL BLACK's paper* as existing in Glasgow, more especially since the reverse of the picture was not long since prominently dwelt upon in the columns of the *Lancet* in a manner which, we think, was wanting in fairness to the general body of pharmacists.

Having but recently expressed our opinions on "the relations of pharmacy to medical practice,"† we will not again enter upon the arguments which we then adduced in answer to the complaints of our contemporary on the subject of counter-prescribing by druggists. We are no advocates of the practice, but while we know that under some conditions it would be studiously avoided, we cannot shut our eyes to the fact that under other conditions, probably of most frequent occurrence, it is unavoidable and, if only for that reason, not properly a ground for reproach by medical practitioners. Indeed, we believe that all reasonable men, whether medical or pharmaceutical, would agree in the opinion that no precise rule can be laid down in this matter as to what is proper and what improper, but that under the guidance of mutual respect and consideration between medical men and pharmacists, the individual judgment of those concerned is the best means of preventing any interference with the proper functions of either class.

The circumstances described by Dr. CAMPBELL BLACK, however, are of such a nature as not to be regulated by any such principle of action. The keeping of open surgeries—as they are called—or, in plainer terms, druggists' shops, by medical men is an open invasion of the pharmacist's business, not a mere shifting of the demarcation between that business and the sphere of the medical men, determined by local conditions. We would willingly entertain the idea that the practice described by Dr. BLACK was confined to Glasgow; but though we know this is not the case, we trust that city is unequalled in regard to the extent of the evil.

* See p. 812. † See p. 410.

MEDICINAL PLANTS.

There are but few plants with which we are acquainted that have not, at some time in the course of their history, had a reputed value for the cure of some complaint or disease. This is notably the case in India and other parts of the tropics. If good for no other purpose, they are invariably said to cure snake-bites. The reason why so many Indian plants of reputed medicinal value are not used in this country is, we suspect, not so much on account of the want of a proper trial of their properties, as to the fact of our having already articles with similar properties of recognized and proved value. Considering the number of members of the medical profession now scattered over India, we might reasonably suppose that as good a test of the properties of medicinal plants can be made there as in England.

Occasionally, however, new medicinal agents are brought to this country from various parts of the world,—one of the most recent of these introductions which has come to our notice being a packet of sticks of irregular length, each about three-quarters of an inch in diameter, with a thick whitish-grey bark. They are sent under the name of condor or vulture cane, and are said to be a valuable medicine in cases of cancer, in the Republic of Ecuador. The plants, we are told, grow in the province of Loja, but, as nothing but the mere sticks have been received, we are unable to give even a clue to their botanical affinities.

Professor Frankland, in his latest report to the Registrar-General, states that the quality of the Thames water has greatly improved during the past month, but that the best water supplied from that source still contained more than four times as large an amount of organic elements as that present in water obtained from wells sunk into the chalk.

In a letter which we publish elsewhere, Professor Frankland corrects the statement in Mr. Ekin's paper, that he regards the amount of nitrates in water as necessarily the result of the oxidation of sewage matter, and points out that the data given by him as representing antecedent contamination of water are reported under the general heading of "Previous Sewage or Animal Contamination (Estimated)."

As a proof that it is not intended to allow the new law for sustaining the better education of apothecaries in Baltimore to become a dead letter, it is stated that a druggist doing business in the western section of that city has been arraigned upon the charge of prosecuting his business without having undergone the examination prescribed by the Act of last year, and fined fifty dollars and costs.

In reference to the paper on "Sumbulus Moschatus," at page 807, we may remark that a specimen of the plant yielding this drug has, we believe, been received from St. Petersburg, and is now growing at Kew Gardens, but has not yet flowered.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The usual Fortnightly Meeting of this Association was held in Anderson's University, 204, Georges Street, on the 22nd of March; Mr. Thomas Davison, President, in the chair. There was a very large attendance, several medical gentlemen being on the platform: D. Frazer, Esq., P.C., and Messrs. Beattie, Scott, Peacock, Symington and Nelson were elected members. On the motion of Mr. J. Fergus Wilson, seconded by Mr. W. R. Kermath, a large and influential Committee was appointed to endeavour to extend the early closing movement to all branches of the drug trade in Glasgow and neighbourhood.

D. Campbell Black, Esq., M.D., was then introduced, and delivered an address on "The Relations of Prescriber to Dispenser."

Mr. President and Gentlemen,—As a practitioner, a comparative stranger in this city, the request that I should deliver a short address before the members of this Association I received as a compliment. I received it in that spirit, on the reflection that it emanated from a Society representing now a large and intelligent section of the community, and one entitled at the hands of the medical profession to the most courteous consideration. If I ask myself on what grounds I merited this honour, I confess to feeling somewhat puzzled for an explanation, if it be not, perchance, that a report of my pugnacity—which let me do myself the justice to inform you much belies me—has reached you, and that towards the termination of your course of lectures you were solicitous of a little mental relaxtion. Be that as it may, it is nevertheless true that I hold, on some medical questions opinions which some are pleased to term extravagant and Utopian. Whether they are entitled to be so designated it is not for me to say, while I am satisfied that they are the expression of a sincere conviction, and that, as such, I have never exhibited timidity in proclaiming them, but have ever regarded personal consequences as of subsidiary moment. Well, Gentlemen, you have heard that in the culinary achievement of making hare soup, the first part of the process is to catch your hare; and having in an evil hour, perchance for myself, acceded, so to speak, to the flattering dalliance of your secretary, the question of a subject presented itself. In this several things had to be considered. Prominently among these, the limited time at my disposal; and, again, the desirability that I should endeavour to entertain you with a subject mutually familiar. Perhaps you are aware, some of you at least are, that in a paper which I read before the Medico-Chirurgical Society of this city in October last, and for portions of which I had to submit to the usual amount of abuse,—a task which I congratulate myself on having survived,—I animadverted on some of the relations which subsist, in this city, between the dispenser of medicine and the prescriber. The limits of my paper on that occasion permitted but a cursory allusion to this important subject; and it occurred to me that on this occasion which you have done me the honour to place at my disposal, I ought profitably to enlarge on that portion of the subject treated of in my paper on "Medical Reform," and endeavour to show, not that the present relations between prescriber and dispenser are desirable, but that they are extremely unsatisfactory, and that the public benefit, and the dignity of the profession, demand of a large number of my professional brethren concessions which they appear extremely reluctant to make. There was a time in the history of medicine when dispensing was exclusively in the hands of medical practitioners. As medical science extended, and as investigations into physiology and pathology were more assiduously prosecuted for the purpose of unravelling the hidden symteries of disease, and basing its treatment on rational principles—an object at present the most prominent and most praiseworthy of modern medicine,—what might be called the manipulatory portion of our art became discarded by the heads of the profession, and was confined in England and Ireland to the licentiates of the Apothecaries' Company in the respective countries, such licentiates possessing, according to law, certain privileges; while in Scotland the same conditions developed the drug trade, in addition to the shops of medical practitioners. Corresponding to the licence of the Apothecaries' Company in England and Ireland, there was no analogous qualification in Scotland, save, perhaps, that the licence of the Royal College of Surgeons of Edinburgh and of the Glasgow Faculty conferred the right to deal in pharmacy. In the latter country a physician, *i. e.* a graduate of medicine of a university considered it quite honourable and legitimate to keep open shop; while in the former the apothecary was almost exclusively what might be called, with a violation of gender, in these primitive times when ladies attended to their household duties, the handmaid to the physician, or pure surgeon. To indicate how defined the duties of apothecary were even in the sixteenth century the following quaint rules for an apothecary's life and conduct merit quotation:—

"1. Must fyrst serve God, forsee the end, be clenly, pity the poore.

"2. Must not be suborned for money to hurt mankynde.

"3. His place of dwelling and shop to be clenly to please the sences withal.

"4. His garden must be at hand with plenty of herbes, seedes, and rootes.

"5. To sow, set, plant, gather, preserve and keep them in due tyme.

"6. To read Dioscorides, to know ye nature of plants and herbes.

"7. To invent medicines, to choose by colour, taste odour, figure, etc.

"8. To have his mortars, stilles, poltes, filters, glasses, boxes, clene and sweette.

"9. To have charcoles at hand to make decoctions, syrups, etc.

"10. To keep his cleane ware close and cast away the baggage.

"11. To have two places in his shop, one most cleane for the physic, and a baser place for the chirurgerie stuff.

"12. That he neither increase nor diminish the physician's bill, *i. e.* (prescription) and keep it for his own discharge.

"13. That he neither buy nor sell rotten drugges.

"14. That he peruse often his wares, that they corrupt not.

"15. That he put not in *quid pro quo* (*i. e.* use one ingredient in the place of another when dispensing a physician's prescription) without advysement.

"16. That he may open wel a vein for to helpe pleurisy.

"17. That he meddle only in his vocation.

"18. That he delight to reede Nicolaus Myrepsus, Valerius Cordus, etc. etc.

"19. That he do remember his office is only to be ye physician's cooke.

"20. That he use true measure and weight.

"21. To remember his end and the judgment of God; and thus do I commend him to God, if he be not covetous or crafty, setting his own lucre before other men's help, succour and comfort."

The apothecaries to whom these rules were given were merely grocers, who elected to perform the meaner duties of the physician or surgeon. In the fourth year of James I. a charter was obtained that "willed, ordained and granted, that all and singular the freemen of the Mystery of Grocers and Apothecaries of the City of London, should and might be one body, corporate and politic, in deed, fact, and name of the Warden and Commonality of the Mystery of Grocers of the City of London." And in the thirteenth year of the same King and reign these so-called mysteries were disunited, this being the origin of the London Apothecaries' Company. For a considerable time after their formation as a company, the apothecaries were kept closely under the surveillance of the College of Physicians; but as time wore on, they began to assert their independence, and took to prescribing after the fashion of the physicians. This, of course, applies to England, but I refer to the circumstances in order to indicate that originally the Society of Apothecaries was intended to be subservient to the physician and surgeons. In Scotland the conditions to which I have already adverted, developed a large commercial enterprise, independent of the Scotch physicians and surgeons, but possessing no chartered privileges. Public benefit at length demanded—the trade having become such an extensive one—a guarantee of knowledge of the business, and ability to dispense physicians' and surgeons' prescriptions, and through the exertions of the Pharmaceutical Society, an enlightened measure was carried through Parliament in 1868, whereby it is, *inter alia*, provided "That it shall be unlawful for any one to sell, or keep open shop, or to assume the title of 'chemist and druggist' or the like, unless he shall be properly registered under the Act," and in order to obtain proper registration under the Act the passing of a very stringent examination is a necessity. Now, Gentlemen, I look upon the Pharmacy Bill as having entirely superseded the charter of the Apothecaries' Company in England, and as having virtually cut the connection between the practice of medicine and surgery, and pharmacy as a trade in Scotland; and as the result of some attention to the subject, I am firmly persuaded that it is expedient that this separation should exist. I shall not take up your time by animadverting upon the hue-and-cry raised against the Bill by the medical practitioners. You may remember the widespread consternation as to the shutting of their shops. I thought the agitation discreditable to the profession, and I, for one, extremely regret that the Act was not enforced in its primary interpretation. I therefore think the Pharmacy Bill an enlightened measure, for if there is any one belief that I hold stronger than another on medical matters, it is this principle, that no medical practitioner should have a pecuniary interest in the drugging of his patients. This being the case, I maintain that indiscriminate drugging is too much the custom both in England and Scotland (I cannot speak for Ireland); that it does much to subvert a rational faith in medicine, and that, to a great extent, the shop system is chargeable with the offence. In the face of the Pharmacy Bill, and for sundry other reasons which I shall refer to in the sequel, I hold that it is highly discreditable to the city of Glasgow, that out of a total of 190 practising practitioners, not less than 120 should put themselves in open competition with qualified druggists. In the discussion raised upon my paper, read before the Medico-Chirurgical Society, the President of the Faculty contended that I exaggerated and misrepresented the condition of the profession in Glasgow, and by implication admitting the shop system to be inimical to the interests and dignity of the profession, held that there was not now one medical man's shop for eight that previously existed. I now tell you that this is a great mistake, for there never were more doctors' shops in Glasgow than at present.

But, Gentlemen, if I denounce this system of practice I must justify my denunciations of it. For the shop system, so far as several medical men in this city are concerned, I plead the apology of necessity, but this is quite beside the question of principle, and in what respect I plead this necessity I have in my paper on "Medical Reform" endeavoured to point out, and your time will not permit me to enter on this part of the subject on this occasion.

Well, I charge the shop-system with slipshod treatment of disease, indiscriminate drugging, and a downward competition. You may find in some of the surgeries of Glasgow, so-called, of an evening, perchance from a dozen to two dozen people waiting to see the mysterious person ensconced beyond the green door, on which "Consulting Room" shines so prominently. It takes time to arrive at a correct diagnosis, it takes time to prescribe suitably to the disease, and this time being taken, an honest advice should be given, and an honest advice is worth paying for. It is the merest farce in the world, and it is an outrage on medical science, to prescribe for a crowd of an evening, and dole out to a credulous multitude a heterogeneous mixture from this bottle and the other; and I deny that in the majority of cases this system of treatment can be reconciled to any physiological, pathological, or chemical principle. No; the threshold of such establishments is like Pluto's portals—

"Smooth the descent and easy is the way;
But to return (without the bottle) and view the cheerful skies,
In this the task, the mighty labour lies."

No fee being exacted in the back room, "the bottle" is sure to be advised "to be got at the counter." It is what might be called a case of *double do;* the patient endeavours to *do* the doctor, and the doctor in return *does* the patient. This is what is called "the bottle system," and is one for which Glasgow holds conspicuously an unenviable notoriety; and it has ingrained into the minds of so many in the city the belief that medical men should be paid for their medicine, that a medical man without a shop is a *rara avis in terris.* But if he be asked why this system is so much in favour here, the only explanation vouchsafed is, that it will not do to practise otherwise in Glasgow. Well, I have only to remark, that I am not aware of any physiological peculiarity in Glasgow citizens compared with the denizens of Edinburgh or Greenock; in the former of which there are but few doctors' shops, the number not above four, if I am correctly informed, and in the latter only one. I believe these towns have an equal proportion of poor people as we have, and in Greenock especially there are none of those self-seeking excrescences on modern practice—Special Institutions. Yet we never hear complaint that the humbler orders do not receive adequate medical attendance. In a word, medical practice in Greenock is conducted on the purest method—considering the size of the town and the large proportion of the artisan class—perhaps in Scotland.

But further, the shop system encourages a downward competition, and, in consequence, an adulteration of drugs. I am of those who believe that if a thing is worth purchasing it is worth paying for; and if this principle hold good in any commercial transaction, it assuredly obtains in the purchase of medicine. Unfortunately, however, "common sense" is a very *un*common attribute of modern humanity, and ten to one, the chances are, that the man who asserts most strongly in perfect disregard of an ancient virtue, called truth, or who most conforms to the claptraps of a Cheap-John, is the man who will be most generally patronized. If the power of assertion was ever of service, it is eminently in this age; lying, to use a plain term is, *par excellence,* one of the most profitable avocations in these latter days. In an age, therefore, when people do not hesitate to stuff life buoys with other material than cork, and even tamper, according to the sage of Chelsea, with the very composition of bricks, we need not be surprised if what is termed a colocynth pill is *not* a colocynth pill. In the adulteration of medicine the man who is both prescriber and dispenser has an obvious advantage over the simple compounder of medicine; the former, trusting to the beneficence of the *vis medicatrix naturæ,* and having an eye to a plethoric till, often goes on the principle that a rose by any other name will smell as sweet, finds, by experience,—a much abused term by the way,—that it is immaterial whether his compounds are made according to the Pharmacopœia or not. You will not be surprised, therefore, to learn that I know of an instance where a surgeon represented to a pharmaceutical chemist that he must reduce his pills to three-halfpence per dozen, a price at which, I am told, it is perfectly impossible to make up colocynth pills according to the Pharmacopœia, not to speak of the trifling profit which every reasonable person will, as a matter of justice, ungrudgingly allow the compounder. In these cases, I am informed, the scammony is either all or in part left out,—a veritable case, Gentlemen, of the play of 'Hamlet,' with the ghost omitted.

Now, medical science may suffer in this respect, and if I were at a loss to draw an inference, I might contend that practices such as these conspire to make Glasgow practitioners so little known beyond the good old city of Saint Mungo. I am, at all events, informed, on excellent authority, that druggists are worse remunerated here than in any city in the kingdom, and that, as we might consequently expect, we excel likewise in the adulteration of medicines. Not only does medical science suffer in this manner, but the reputation of a gentleman who simply prescribes is imperilled if his prescriptions lucklessly find their way into any such establishment. It is in my recollection that while the Pharmacy Bill was passing through Parliament, one of the grounds of opposition to it was that there was no clause in it rendering the compounding of medicines according to the British Pharmacopœia compulsory; and I remember that on this point the *Lancet* very sensibly suggested that any such procedure was like putting the cart before the horse, for if physicians prescribed according to the British Pharmacopœia, the necessity of compounding medicines according to it would be forced upon druggists; but it is surely breaking faith with us, and is a violation of a public trust reposed in druggists, if physicians so prescribe, and their patients are not supplied with what is so ordered. Now, is it a fact that the existence of medical practitioners' shops to the extent that we have them in this city fosters indiscriminate medication? My experience decidedly confirms this belief. Repeatedly have I witnessed an ominous row of bottles, so significant of wry faces, adorn the mantelpiece of poor patients' houses; and how often is the confiding remark made that Dr. So-and-so is a very fine man,—"a skilly doctor,"—that no one grudged him his fee, but had an awful horror of the bottles! I have elsewhere endeavoured to show that by this system a great injustice is done to the public, and that it is a method of practice the most powerful of any I know in pauperizing people of slender means, and subverting professional integrity and honour. Human nature will be human nature to the end of time; and be a man however estimable and upright in his inclinations, circumstances have a proverbial influence in altering cases; and when a certain amount of money is invested by a medical man in a drug establishment, looking at the question from a commercial point of view, he must to a great extent be influenced by a good return. I hold that this inducement—be it an unconscious bias—is not compatible with the honest practice of the medical profession. This, of course, leads to the incessant changing of bottles, powders, etc. Now one bottle, to-day another, and so on. It is a case of—

"At nine these powders let him take,
At ten the draught, the phial shake:
And you'll remember at eleven
Three of these pills must then be given.
This course you'll carefully pursue,
And give at twelve the bolus too.
If he should wander, in a crack
Clap this broad blister on his back;
And after he has had the blister
Within an hour apply the clyster.
I must be gone; at three or four
I shall return with something more."

To my mind, the man who so acts,—and this is no imaginary picture,—if he be honest, can at least have no well-founded conception either of disease or its appropriate treatment; and the intelligent patient will not fail to discover that his medical attendant is a man fighting an unseen enemy in the dark, or is solicitous of pushing the trade in which he has so immediate an interest, that medical science must suffer. That will be apparent to any one; for how is it possible to deduce any reliable inference from such heterogeneous treatment?

But, Gentlemen, to give you a home thrust now, the complaint is frequently urged against you by my professional brethren, that you encroach on the province of the physician in counter-prescribing, and that opportunities are afforded you of doing so in a peculiarly favourable manner in this city, where a drug shop and a medical man are with the great bulk of the population identical. Let me remind you of the rules of Bullyen above-quoted, "That the apothecary meddle only in his vocation," and "That he do remember that his office is only to be ye physician's cook." You will accede to me the right to contend that if I consider it expedient that we should leave the pharmaceutical department to you, you must meet us in an equally liberal spirit.

And I will say this for the most respectable druggists with whom I have conversed on this subject, that they discourage counter-prescribing, and reprehend its performance in others. To me it is quite clear that it is only by mutual concessions between dispenser and prescriber that their relations can be satisfactorily adjusted. It is thus that we must endeavour to wipe out the stigma against medicine,—that the ancients endeavoured to make it a science and failed; the moderns to make it a trade, and succeeded.

But, Gentlemen, while I am opposed on principle to the shop system, you will not be surprised if I fail to find words to express my indignation at the sale of quack medicines by duly qualified medical practitioners. It appears to me to be a lamentable manifestation of professional degeneracy that so many doctors' shops in this city should display the meretricious tinsel of the impostor; nay, further, that registered practitioners should stoop to the issuing of circulars for the purpose of bringing quack medicines under the notice of the public in conjunction with their names. There has been, and ever will be, a section of the public which *will* be gulled, and that section, I regret to say, not the most illiterate; but, above all others, should we not expect members of the medical profession to spurn the puffing of quack medicines? What can be expected of the public, in the face of such conduct by medical men? I cannot witness without a feeling of profound humiliation such cards as, "For a Cough, try Gibson's Lozenges," exhibited in surgeons' windows, and, with like feeling, "Rooke's Pills" and "Solar Elixir" or "Whelpton's Purifying Pills," pressed into the service of surgeons' shop-window ornamentation. Of a surety Ichabod has been inscribed on the Æsculapian temple in modern times. Let me refer you to the birthplace of our science in the island of Cos, 400 years before the Christian era, for a nobler example. Here Hippocrates, in the grey dawn of history, dedicated his best energies to the cultivation of our science, with that object which, above all others, should be paramount with the honest physician, the amelioration of suffering; and to the immortal honour of our father be it said that, diligent and skilled in his profession, he openly avowed the measures he had taken to cure diseases. And even in the fourteenth century a righteous detestation of imposition manifested itself in such punishment as the following:—It is recorded that one Roger Clerk professed to be learned in the art of medicine, and prescribed for a woman suffering from fever the hanging of a certain document round the neck, containing certain herbs, which he stated were an antidote to the disease under which she suffered. The charm did not work. He was summoned before the Mayor and Aldermen of the Guildhall of London, at the instance of the husband of the patient, to show upon what authority he practised the art of medicine. His own statement was sufficient to convict him of being a rogue and an impostor, and he was forthwith ordered to be placed in the pillory, and therein to be punished for the offence he had committed against society. His progress to the pillory is thus described:—"It was adjudged that the same Roger Clerk should be led through the middle of the city with trumpets and pipes, he riding on a horse without a saddle, and the said parchment and a whetstone for his lies being hung about his neck, a urinal also being hung before him and another behind." Oh for some such punishment in these days of boasted progress! Only I would extend the treatment to all abettors of quackery; and you can fancy, gentlemen, if such treatment were enforced in Glasgow, what an imposing procession would be thus formed.

Time compels me, however, to draw these remarks to a conclusion; but I may observe that I find it far more excusable on the part of the pharmacist to sell quack medicines as a branch of his business. This is a question with him regulated by the law of supply and demand, and one over which the druggist has no control, save at considerable sacrifice, which his refusal to sell patent medicines would entail. The ignorance and gullibility on the part of the public is an antecedent condition, and it is his as a matter of business to meet the demand so created. The case is very different with the medical man, whose duty it ought to be to dispel delusion and error. I am of those who believe that no enlightened Legislature should afford its protection to any secret preparation, and on this point the law of France is worthy of imitation. As there is no law to which exception may not be taken, and no principle which is universally applicable, there may occur certain cases in which it is impossible to practise medicine without dispensing also, as in rural districts and in connection with appointments to large public works. I will go a little further than this: if a medical man chooses to supply medicine to his own patients from his private dwelling, I do not think, looking particularly at the matter, as a step further advanced in the severance of the duties of medical practitioners from that of the pharmacien, that the practice is so objectionable.

Gentlemen, these then constitute some opinions I have long entertained on the relations of prescriber and dispenser, and you will do me the justice to believe that I have come here neither to flatter you nor to traduce my professional brethren; my endeavour has been to follow the sound rule of nothing extenuating, nor setting down aught in malice. I cordially sympathize with you in asking my brethren to move on—to give up merchandise—and I am firmly persuaded that medical science and the public would be the gainers. Perfection, it is true, does not pertain to things terrestrial, but that is no reason why we should not vie one with another in the degree to which our actions should incline towards the most honourable conduct, even at the risk of being classed as I have been among the "fussy grievance-mongers."

I console myself with the reflection that I am actuated by no envy, while it is a well-known truism—

"How rarely, friends, an honest man inherits.
Honours and wealth with all his toils and pains,
It sounds like language from the land of spirits,
If any man obtain that which he merits,
Or any merit that which he obtains."

Gentlemen, I am exceedingly obliged to you for the courteous attention with which you have listened to these my fragmentary observations.

The President, in proposing a vote of thanks to Dr. Black, stated that he could corroborate many of Dr. Black's remarks with reference to both surgeons and druggists keeping very inferior drugs; it was only the other day, he said, that a medical practitioner who held his diploma from the University, called upon him and wanted colocynth pills at 1*s*. per gross; and though he was glad to say such a state of things was gradually dying out, he thought it was a disgrace to the profession that they should encourage such a state of things.

Mr. Kinninmont, in seconding the motion, also referred in humorous terms to the unhappy state of matters between prescriber and dispenser. With regard to counter prescribing by the druggists, he said that respectable chemists were very often placed in an awkward predicament; for, through the great number of surgeon-druggists in the city, the public had got accustomed to look upon the counter as the proper place to get prescribed for in any but serious ailments, and that if a druggist refused to prescribe bilious pills or a calomel powder when asked, the customer would invariably go to the nearest surgery and get supplied there with what he wanted. He also pointed out that people when they asked a druggist's opinion on anything, generally had their mind made up as to what they wanted, and merely wished the druggist to assure them that the medicine they had made up their mind to take was the proper thing.

After some amusing remarks by Dr. Moffat, the vote of thanks was heartily responded to.

The Secretary afterwards, with permission of Messrs. Evans, Sons and Co., Liverpool, presented one of their Five Guinea Cabinets of materia medica to the Association.

The President, in accepting the cabinet in the name of the Association, said he had no doubt the members would all make a good use of it; and those especially who had examinations to pass, would find it of great benefit in assisting them in their studies.

Mr. Paterson seconded the motion, and suggested that a brass plate be engraved with names of donors and date of presentation, to be placed on top of cabinet, so that "he who runs may read."

The suggestion was supported by Mr. M'Millan, and agreed to with acclamation.

A special general meeting of pharmaceutical chemists and chemists and druggists on the "poisons" question was announced for Monday, 3rd April; and a paper on "Volatile Oils" for next ordinary meeting of the society.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Anniversary Meeting, March 30th; Prof. Williamson, F.R.S., President, in the chair.

The President delivered the following address:—

"Gentlemen,—I feel much pleasure in congratulating you on the rapidly increasing prosperity of our Society and the enlargement which has taken place in its sphere of usefulness; for, on the one hand, the number of our Fellows continues to show a most satisfactory increase; and, on the other hand, your Council has made arrangements for carrying out the system of monthly reports which has been for some time in contemplation. It was hoped that the Chemical Society of Paris might, from the first, co-operate with us in the preparation of these monthly reports, but circumstances beyond their control have prevented the sister society from joining us in the beginning of this year. Deeming it undesirable to delay the commencement of the reports, your Council still look forward to the future co-operation of the Paris society in their preparation.

"You are aware that the present available income of the Society was not considered to be sufficient to defray the additional expense of writing and printing these reports, and I have the pleasure of informing you that contributions to the extent of £1175 have been promised by members of your body towards supplying the deficit during the first five years of the appearance of these reports. The British Association has, moreover, granted us the sum of £100 for this year in aid of the undertaking. We hope that in five years the funds of the Society may have sufficiently increased to enable us to pay the whole expense of the reports, and that their publication will be valued by the members of our Society, and promote the advancement of our science, wherever the English language is read. The next number of our Journal, which I hope to see in a few days, will be the first to contain the monthly reports in addition to the original papers contributed to the Society.

"At the last anniversary meeting, we numbered 551 ordinary members and 36 foreign members; 6 of the former have withdrawn from the Society. On the other hand, 42 new members have been elected into the Society. We have lost 5 ordinary members by death, viz. Mr. George Tolley, Dr. W. A. Miller, Dr. Aug. Matthiessen, Dr. J. S. Muspratt and Mr. W. W. Rouch; and it is also my painful duty to record the death of two of our foreign members, viz. Prof. Gustav Magnus and Prof. Weltzien."

After the delivery of the address, the Treasurer read his account of the Society's finances, which shows a balance of more than £1300 at the Society's bankers.

The election of the President, the officers and the other members of Council for the ensuing year was then proceeded with, and the following is the list of the gentlemen elected:—

President: E. Frankland, D.C.L., F.R.S.

Vice-Presidents, who have filled the office of President: Sir B. C. Brodie, F.R.S.; Warren De la Rue, Ph.D., F.R.S.; A. W. Hofmann, D.C.L., F.R.S.; Lyon Playfair, Ph.D., C.B., F.R.S.; A. W. Williamson, Ph.D., F.R.S.; Col. P. Yorke, F.R.S.

Vice-Presidents: H. Debus, Ph.D., F.R.S.; J. H. Gilbert, Ph.D., F.R.S.; H. M. Noad, Ph.D., F.R.S.; W. Odling, M.B., F.R.S.; T. Redwood, Ph.D.; J. Stenhouse, Ph.D., F.R.S.

Secretaries: A. Vernon Harcourt, M.A., F.R.S.; W. H. Perkin, F.R.S.

Foreign Secretary: H. Müller, Ph.D., F.R.S.

Treasurer: F. A. Abel, F.R.S.

Other Members of the Council: E. Atkinson, Ph.D.; H. Bassett; C. L. Bloxam; A. Dupré, Ph.D.; F. Field, F.R.S; M. Holzmann, Ph.D.; H. M'Leod; E. J. Mills, D.Sc.; H. E. Roscoe, Ph.D., F.R.S.; W. J. Russell, Ph.D.; R. Angus Smith, Ph.D., F.R.S.; A. Voelcker, Ph.D., F.R.S.

The meeting terminated with the customary votes of thanks to the retiring President, the Secretaries, the Treasurer, etc.

MEETINGS FOR THE ENSUING WEEK.

Tuesday April 11.	*Royal Medical and Chirurgical Society*, at 8.30 p.m. *Photographic Society*, at 8 p.m.
Wednesday April 12.	*Society of Arts*, at 8 p.m.—"Boiled Oil and Varnishes." By C. W. Vincent. *Microscopical Society*, at 8 p.m.
Friday April 14.	*Quekett Club*, at 8 p.m.

Obituary.

AUGUSTUS DE MORGAN.

Although not connected with the particular branch of science which is of most interest to the readers of this Journal, the late Professor De Morgan was a man of such eminence, and had secured to himself the admiration and respect of so large a portion of the community, that no apology is needed for giving more than a bare notice of his death.

Augustus De Morgan was born at Madura, in Southern India, in June, 1806, and was the son of a colonel in the Madras army. On the maternal side he traced his descent from the mathematician, James Dodson, F.R.S., many years master in the mathematical school of Christ's Hospital and author of the 'Antilogarithmic Canon,' a circumstance to which he regarded himself as indebted for his particular bent of mind. Sent early to England, in 1823 he went to Cambridge, where he became fourth wrangler in 1827, before he was twenty-one years of age. Conscientious scruples preventing him from subscribing to the necessary tests, he was debarred from the college fellowship to which his high position would have otherwise entitled him. He afterwards entered Lincoln's Inn and commenced the study of law, but he soon left this and devoted himself to his favourite study. In 1828, he became Professor of Mathematics at the London University—now University College,—which office he held, with the exception of the five years from 1831 to 1836, until 1866; when, not approving of the course adopted by the Council in an appointment to one of the professional chairs, he resigned and left the College, of which he had been for nearly forty years one of the most distinguished ornaments.

Professor De Morgan was the author of several well-known treatises on the various branches of mathematics and logic, and a contributor to the *Penny Cyclopædia*, Knight's *British Worthies*, the *Philosophical Magazine*, the *North British Review*, the *Transactions of the Cambridge Philosophical Society*, the *Athenæum*, etc. He was also resorted to for advice by many of the principal life assurance companies.

Professor De Morgan had been ill for a considerable time previous to his death. An attack of paralysis was followed by a disease of the kidneys, and he died on Saturday the 18th of March, at sixty-five years of age.

M. Émile Hepp, the well-known pharmaceutical chemist, of Strasbourg, while labouring to extinguish the fire caused by the German artillery in the civil hospital, on the night of the 25th of August, received an injury which has caused his death, after more than five months' suffering, at the age of fifty-two. The *savants* of Strasbourg assembled around his grave, and several short addresses were pronounced over his remains. M. Hirtz has paid a further tribute to his late colleague by the publication of a careful biography, setting forth Émile Hepp's scientific claims.—*Athenæum.*

The death is announced of Mr. Samuel D. Hendel, a prominent American pharmacist, and member of the firm of Leitch and Hendel, of St. Louis, Missouri. He died suddenly from apoplexy on the 23rd of January, at the age of forty.

Another eminent pharmacist, of the same city, Mr. Eugene L. Massot, died on the 14th of February. At a special meeting of the St. Louis College of Pharmacy, the following resolutions were passed:—

"Whereas, the death of Mr. E. L. Massot having been announced to this college, we feel it our privilege and duty to give some expression to our deep sense of his loss and our affectionate respect for his memory. Therefore, be it

"Resolved—That we bear most willing testimony to his faithfulness and devotion in promoting the interests of this college, he being one of its most thorough friends, who, at all times, spared no trouble and thought no labour too great to advance its interests. The records of this institution recite the confidence placed in him by its members. Filling successively the offices of President and Vice-President, he gave to each position that careful attention so necessary for the successful workings of such an institution as ours is. His blameless and consistent life, his amiable and genial disposition, and his eminently attractive social qualities, rendered his society sought for not only by members of his profession, but by all who came within the sphere of his acquaintance.

"Resolved—That we will attend the funeral and cordially unite in every token of respect to his memory.

"Resolved—That a copy of these resolutions be presented to the family of the deceased, and that the pharmaceutical journals of the country and the city press be requested to publish the same."

The *Chemical News* announces the death of Dr. Charles M. Wetherill, of Bethlehem, Pennsylvania. The deceased gentleman had been a pupil of Liebig, and was esteemed by his American fellow-workers as one of the most active chemists America possessed.

Review.

The New Theory and Practice of Medicine: a Treatise on the Nature, Cause, Cure and Prevention of Disease, with practical illustrations of the medicinal and other uses of Hibbert's Patent Antiseptic Solutions. Published by the Author, W. Hibbert, Cheetham, Manchester. 1870.

At a time when the most accomplished and philosophically-minded physicians are admitting that medicine, as a science, is little more than on the threshold, Mr. W. Hibbert announces his discovery of the true nature and cause of disease in general, and, what is more to the point, the sovereign remedy for its symptoms in particular.

In a preface, the style of which makes us more than dubious whether Mr. Hibbert has received an ordinarily good education, he unfolds what may be regarded as his ideas of "pathology"—ideas, we may confidently assert, considerably in advance of any entertained by the Royal Colleges of Physicians or Surgeons. Dexterously hooking on Professor Lister, of Edinburgh, to his little medical go-cart, he comes to a halt before the British public, and assures them, in genuine showman's language, that the remedy for all their ailments is stowed away in his vehicle, and that they have only to "walk upstairs," and on payment of a small gratuity, obtain the desired relief. Like all others of his class, he is very strong in the kind of phraseology which at once alarms and mystifies the vulgar—"debility," "organic imperfection," "misdirected nervous irritability" (whatever that may mean), "disposition to morbid activity," and so forth—phrases which may signify anything or nothing, but which the empiric is well aware will be interpreted by his appropriate audience on the principle of "omne ignotum pro *horrifico*." It is quite unnecessary to examine Mr. Hibbert's positions in detail. His *ipse dixit* is quite sufficient for us. But before proceeding to burn our Pharmacopœia, throw physic to the dogs, and sign a petition for the ostracism of "duly-qualified" pretenders, we should like him to explain how his antiseptic solution is good at once for diarrhœa and constipation. When he has satisfied us on this point, we shall refrain from inquiring whether or not it is an accidental coincidence that he hails from *Cheet-ham?*

The following journals have been received:—The 'British Medical Journal,' April 1; the 'Medical Times and Gazette,' April 1; the 'Lancet,' April 1; the 'Medical Press and Circular,' April 5; 'Nature,' March 30; the 'Chemical News,' March 31; 'Journal of the Society of Arts,' March 30; 'Gardeners' Chronicle,' April 1; the 'Grocer,' April 1; 'Produce Markets Review,' April 1; the 'English Mechanic,' March 31; the 'Journal of Applied Science' for April; the 'Florist and Pomologist' for April.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[186.]—BAKING POWDER.—
Sodæ Bicarb. 16 oz.
Acid Tart. Exsicc. 8 oz.
Rice Flour, 12 oz.

The acidity naturally present in a mixture of flour and water renders a larger proportion of tartaric unnecessary.—T. S.

[191.]—SOLVENT FOR WHITE SHELLAC.—Perhaps your correspondent is not aware that, unless white shellac is dissolved *within a fortnight of its preparation*, it is not worth 6*d*. per ton; but within that period it is easily soluble in naphtha or finish.—CHARLES B. ALLEN.

[*** White shellac is usually kept in water, by which means its capability of being dissolved is preserved. This property is very soon lost upon exposure to the air.—ED. PHARM. JOURN.]

[192.]—OXYGEN GAS PURE FOR INHALATION.—Take a bottle furnished with a tube and funnel, and put into it a mixture composed of equal parts of lead peroxide and barium peroxide, then add some weak nitric acid: the reaction takes place immediately, the effervescence is performed quietly and the oxygen liberated.—SAMUEL ELIOTT, Jun.

[193.]—LIQUOR OPII SEDATIVUS.—I send the following formula, given by Mr. Cooley:—Dissolve ℥iij of hard extract of opium (prepared by percolation with temperate water) in ℥xxx of boiling distilled water, and adding to the cold and filtered solution ℥vj of rectified spirit, and water to make up exactly Oij.—HERBARIUS.

[205.]—COD-LIVER OIL AND QUININE.—Methods of dissolving quinine and many other alkaloids and metallic oxides in cod-liver and other oils were described by Professor Attfield in the PHARMACEUTICAL JOURNAL, 2nd Ser. Vol. IV. p. 388. Some time afterwards Mr. Daniel Hanbury stated at an evening meeting of the Pharmaceutical Society that he had found the method answer well for cod-liver oil and quinine.—ED. PHARM. JOURN.

[210.]—COD-LIVER OIL JELLY.—The following formula has been published for this preparation:—

℞. Ol. Morrhuæ	75·00	parts.
Sacch. Alb.	14·88	"
Acid. Citric.	0·60	"
Gelatin	2·76	"
Aquæ	6·56	"
Ol. Essent.	0·20	"
	100·00	

[211.]—HORTICULTURAL INK.—I have tried receipt in Beasley, headed "Ink for writing on Steel or Tin Plate or Sheet Zinc," on zinc, and find it answer perfectly if the labels are well cleaned before and baked after writing.—THOMAS STOKOE.

GLYCERINE BALSAM.

This is designed to whiten and soften the skin, remove roughness, chaps, chilblains, and irritations from common causes.

Take White Wax (pure), 1 oz.
Spermaceti, 2 oz.
Oil of Almonds, 9 oz.

Melt together by a moderate heat in a glazed earthenware vessel, and add—

Glycerine (best), 3 oz.
Balsam of Peru, ½ oz.

The mixture is to be stirred until nearly cold, and then poured into pots. [Instead of balsam of Peru, 12 or 15 drops of otto of rose may be employed.]—*Druggists' Circular.*

ALMOND BALLS.

1. Take of Spermaceti, 2 oz.
White Wax (pure), 4 oz.
Oil of Almonds, ½ pint.

Melt them together in an earthenware pot by the heat of a water-bath, and, when the mixture has cooled a little, add—

Essential Oil of Almonds, 1 drm.
Expressed Oil of Mace, 1½ drm.

Stir the mixture constantly until it begins to cool, then pour it into slightly-warmed moulds, which may be ounce gallipots or egg-cups with smooth bottoms. This will form hemispherical cakes.

2. Take of Hard Clarified Suet, 14 oz.
White Wax, 2 oz.

Melt, and add—

Essential Oil of Almonds, 1 drm.
Oil of Cloves (or Pimento), ½ drm.

and proceed as in No. 1. Cheaper and inferior to the first. Rub it into the skin. [They may be coloured by adding the colouring material while the whole is in a fluid state.]—*Druggists' Circular.*

CAMPHOR BALSAM.

1. Take of Spermaceti, 2 oz.
Olive Oil, ½ pint.

Dissolve by a gentle heat, and add—

Camphor (cut small), 1 oz.

Stir the mixture until nearly cold, and then put into short, wide-mouthed bottles, which should be kept well corked.

2. Take of Curd Soap, 1 oz.
Water, 1½ oz.

Dissolve by heat, and stir in of

Camphor, ½ oz.

previously dissolved in

Olive Oil (hot), 3 oz.

When the whole is thoroughly combined and cold, add—

Oil of Origanum, ¼ oz.
Strongest Solution of Ammonia, ½ oz.
Alcohol, 1½ oz.

and proceed as in No. 1. [These are stimulant and anodyne. The first may be used to prevent chapping of the skin, remove chilblains, and to stimulate the growth of the hair. The second is better for frictions in lumbago, rheumatic pains, etc.]—*Druggists' Circular.*

BALSAM OF HONEY.

Take Fine Pale Honey, 4 oz.
Glycerine, 1 oz.

Mix by a gentle heat; when cold add—

Alcohol, 1 oz.
Essence of Ambergris, 6 drops.
Citric Acid, 3 drms.

This is intended to remove discolorations and freckles, as well as to improve the general appearance of the skin.—*Druggists' Circular.*

CALENDULA JELLY.—HOMŒOPATHIC.

Take of Starch in powder, 70 grains.
Glycerine, 1 fluid ounce.

Mix the powdered starch with the glycerine, and gradually heat the mixture to about 240° F., constantly stirring, and when cold add—

Saturated tincture of marigold flowers, 1 fluid drachm.
Tincture of Cochineal,
Oil of Rose, q. s. to colour, and perfume.—*Pharmacist.*

CALENDULA CERATE.

Take of Marigold flowers, bruised, 1 part.
Place into a porcelain dish and add boiling water, 2 parts.
Let it digest for several hours, and add butter, fresh, 6 parts.
Apply heat until all the water is dispersed, and strain through linen cloth with pressure.

Although the above is an authoritative formula for preparing this innocent external remedy, it will not, if prepared by this process, receive the endorsement of the disciples of Hahnemann, with whom it is a prominent remedy "for all the ills that flesh is heir to," for want of the characteristic yellow colour; and as appearances are great aids to strong faith, we will add a formula for a cerate having the requisite colour, and ensuring simplicity and dispatch in its preparation:—

Take of Tincture of Marigold flowers (saturated) 1 part.
Lard (fresh), 8 parts.

Heat on a water-bath until all the spirit is dispersed, and a uniform preparation is obtained.—*Pharmacist.*

SUGARED CALAMUS, OR CANDIED SWEET-FLAG ROOT.

Take of Calamus Root (cut in small pieces), 1 part.
Macerate in 4 parts of water twelve hours.
Add sugar (crushed), 12 parts,

And with constant stirring dry it perfectly, by the aid of a gentle heat.—*Pharmacist.*

SPECIES LAXANTES SAINT-GERMAIN—SAINT-GERMAIN LAXATIVE POWDER.

Take of Senna leaves, previously exhausted with strong Alcohol, and dried, 16 parts.
Elder flowers, 10 parts.
Fennel seed,
Anise seed, of each, 5 parts.

Cut and well bruise them, mix together, and when dispensing add 40 grains of Bitartrate of Potash to each ounce of species. —*Pharmacist.*

CASTILLION'S POWDER.

Take of Tragacanth,
Sago,
Salep,
Sugar, of each, in very fine powder, 4 parts.
Carbonate of Lime (precipitated), 1 part.
Cochineal, q. s. to colour.

Mix them thoroughly, and pass through a fine sieve.—*Pharmacist.*

BLACK CURRANT LOZENGES.

Take of Black Currants, dried, a sufficient quantity; add a small quantity of water, and soften by heating in a water-bath until reduced to a soft, pulpy mass, pass this through a hair sieve, and evaporate to the consistence of a paste.
Take of this Black Currant paste,
White Sugar, in fine powder, of each 1 pound.
Gum Arabic, in fine powder, 2 ounces.
Citric Acid, in fine powder, ½ ounce.

Mix, and make into a mass with Raspberry Syrup, q. s., and divide into lozenges of 10 grains each.—*Pharmacist.*

[215.]—HAIR DYE.—"*Beta*" would be glad if any one will oblige with reliable and not too expensive recipes for black, dark brown, and light brown hair dyes, without using ammoniæ hydrosulph.

[216.]—SHOW COLOURS FOR LAMPS.—Can any of your readers supply me with the formulæ for good red and green show colours for lamps? They must neither fade nor freeze.—C. S.

[217.]—POMADE.—Can any reader oblige me with a form for Sardinian or Zouave pomade for fixing the moustache?—DELTA.

[218.]—INKS FOR DIES.—"*Inquirer*" would be glad to be furnished with recipes for black and coloured inks to use with dies or stamps.

[219.]—DISPENSING.—I received the following prescription to dispense last week:—

℞. Liq. Ammon. Acet. ℥iv
Spt. Camph. ʒss
Aquæ Destill. ℥iiiss.

M. ft. Lotio.

To be applied to the face frequently. Upon adding the spt. camph. to the liq. ammon. acet. and aqua, there was a copious separation of camphor, by the addition of a little tinctura myrrhæ the camphor was taken up and the lotion became turbid.

Can any of your readers inform me if I am justified in either adding the tinctura myrrhæ to, or straining the camphor from, the lotion?—B. H. H.

Correspondence.

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

PREVIOUS SEWAGE, OR ANIMAL CONTAMINATION IN POTABLE WATERS.

Sir,—In your last number, Mr. Charles Ekin states, in an article on the estimation of nitrates in potable waters, that "according to the reports of the Registrar-General, Professor Frankland regards the amount of nitrates in a water as necessarily the result of the oxidation of sewage matter; and from the nitrates present he actually calculates how great the previous sewage contamination has been.

Permit me to say that I do not entertain, or express in my reports to the Registrar-General or elsewhere, any such view regarding the presence of nitrates in water. Mr. Ekin will find, on referring to my reports to the Registrar-General, that he has misquoted the heading of one of the columns in the analytical table, the words being, "Previous Sewage or Animal Contamination (Estimated)." Even if it be admitted (but the evidence adduced by Mr. Ekin on this point is by no means conclusive) that the nitrates in certain oolitic waters are derived from the oxidation of fossil animal remains, my definition of their origin would still be perfectly accurate.

Royal College of Chemistry, E. FRANKLAND.
March 31*st*, 1871.

STORAGE OF POISONS.

Sir,—In looking over the correspondence in your columns on the storage of poisons regulations, it has struck me that the following would be a good way of putting the whole question.

In the management of our railways, two systems of signalling were, and, I believe, still are, in use,—one a "positive," the other a "negative." Under the former, the way is always considered safe unless a positive signal of danger is raised. Under the latter, the danger-signal is kept raised, and the way considered unsafe until it is lowered.

Now it seems to me that in enforcing the storage of poisons regulations, the Pharmaceutical Council (acting as directors) would be adopting the first of these systems. The officials, *i.e.* the apprentices, assistants and working principals would consider themselves quite safe in discharging their duties, until a danger-signal in the shape of a red triangular label, or "some other distinctive mark" were raised; when they would be expected immediately to pull up and look well that their way was clear before proceeding.

On the other hand, by allowing individual responsibility to rest upon every person in the trade, I consider the second system would be put into operation. The danger-signal would constantly be against us, only to be lowered when we were off duty.

As the railway companies, after putting the positive system to a practical test, have almost unanimously abandoned it in favour of the negative, I think the Pharmaceutical Council would do well to profit by their experience, and not make "physic-taking" a more dangerous experiment than railway travelling.

Leeds, March 29*th*, 1871. S. T.

POISON CUPBOARDS.

Sir,—What sort of cupboard would it take to hold half a ton of arsenic? is a question asked in a recent Journal. Having just planned with a friend something of this description, it may be useful to state what was done. In one of the warehouses is a sort of counter, 8 feet long, some old jars and boxes have to be cleared away from under it, it is then boarded up at each end; about 20 inches of boarding nailed up also at each end in front, and a couple of doors hung in the centre; the doors not locked but fastened with a spring-catch. This will hold a ton of arsenic, if need be; at all events it has room for two casks and a half, containing 7 or 8 cwt. in the whole, and for a box of other poison packages.

A cupboard can easily be made wherever there is a blank wall by putting up a shelf of about 2 feet wide, and then carrying out my plan. For jars, etc. in warehouse, a cupboard is at once had by putting a couple of doors in front of the shelves.

I know some have a very heavy trade in these poisonous articles; the plan I have stated would not be suited so well to meet their wants as the appropriating of an entire room in which all poisons could be kept.

Whatever difference of opinion there may be as to the advisability of compulsory poison regulations, all seem to be agreed as to the propriety of adopting, individually, suitable arrangements for preventing accidents. I am, therefore, induced to trouble you with these remarks.

A COUNTRY CHEMIST.

SYRUP OF PHOSPHATE OF IRON.

Sir,—With reference to the article on syr. ferri phosph. by Mr. Carteighe in this week's Journal, I should like to make a few additional observations.

It appears to me to be not so much a stronger acid in itself which is required, as a freshly prepared (or, perhaps, more strictly speaking I should say, freshly diluted) acid; and I was led to this opinion by noticing, that when the syrup began to deposit very soon after being made, it was just at such times as my stock of dilute acid was getting low, and, consequently, what there was of it was comparatively old. On first noticing this, the thought struck me,—why, this acid has deteriorated from repeatedly using and opening the bottle; but upon second thought, considering the stable nature of this acid, I could not fancy it to be so; and upon testing, it proved not to be, but to be as good as ever, with the simple exception, that I could not get a good syrup with it.

Up to the time of my noticing this I had thought the fault was with the phosphate, and I had tried precipitating from hot and cold, concentrated and dilute solutions, with the acetate of soda, and without it; but all these plans made but a trifling difference in the product. However, after I had such good grounds for believing the acid to be at fault, I made the following trial:—I first diluted a quantity of acid to the proper strength, then with a portion of it made some of the syrup, which I found to keep well, and from time to time, as the acid got older, I made more syrup with portions of the same; and I found that as the age of the acid increased, so the liability of the syrup to spoil increased. Since then I have invariably made the dilute acid when wanted for making the syrup, and I have invariably obtained a satisfactory result; with ordinary precautions it will keep good six months, or even longer. I made a batch in September, 1870, which lasted me until the commencement of the present month, and the last bottle sent out was as good as the first; and I have by me now some dilute acid made last summer, which was used at the time of diluting for making syrup which kept well, and yet that acid will not now hold the phosphate in solution beyond an hour or two, the syrup beginning to turn cloudy almost directly the sugar is dissolved. Beyond this one thing I can find no difference between the old acid and the fresh. Can it be a molecular change? The reaction with all tests is identical, and the neutralizing power with alkalies is the same.

So far, therefore, my experience would go to support the formula proposed by Mr. Carteighe, and I scarcely like to find fault with so accomplished a pharmaceutist; but in one particular it appears to me to be not quite what could be desired. In his formula there is 2 fl. oz. of limpid liquid to be mixed with 10 fl. oz. of syrup; this would make an unusually thin syrup, and might, I think, detract somewhat from its keeping quality. I think the following might be recommended as an amendment, which I have tried and found to answer well:—

Phosphate of iron (freshly precipitated)	96 grs.
Phosphoric acid, sp. gr. 1·5	7 fl. dr.
Sugar	$8\frac{1}{2}$ oz.
Water (q. s. to form 12 fl. oz. syr.)	$5\frac{1}{2}$ fl. oz.

Mix the acid with the water, dissolve the phosphate, then add the sugar, shaking occasionally until dissolved.

ALFRED ROSE.

Maida Hill, W., March 29th, 1871.

PRESERVATION OF SULPHATE OF IRON.

Sir,—I beg to make a correction of a statement promulgated by me, and printed in the PHARMACEUTICAL JOURNAL for May, 1868, on the preservation of sulphate of iron. The method recommended was to place a small quantity of camphor in the vessel containing the sulphate. After having given this plan a fair trial (on a good sample of the sulphate), I was led to the conclusion that it answered the intention perfectly, presuming that the atmospheric oxygen was excluded partially, at least, by means of the vapour of camphor.

More recent experience, however, has shown me that camphor has not the smallest effect in preventing oxidation of badly-made sulphate of iron, *i. e.* when crystallized from a solution containing much free sulphuric acid; while, on the other hand, a well-made salt, with hard, brilliant facets, appears to require nothing beyond a good stoppered bottle and a dry situation to keep it entirely free from oxidation.

GEORGE WELBORN.

OBSCURE PRESCRIPTIONS.

Sir,—As an illustration of one of the numerous phases of a provincial druggist's business, I send the following verbatim copy of a prescription lately brought to a druggist's shop in the county of Lincoln to be compounded. It is probable that no other than an agricultural mind could have conceived such a medley of ingredients, or spelt them in a more intensely rural manner.

2 dr. of fabach.
2 dr. of pilochc.
2 dr. of bittirhapple.
2 dr. of colomet.
10 gr. of gold dust.
2 dr. of mercury.
Sprit of buckthorn sufficient for 60 pills.

31*st March*, 1871. G. W.

ONE OF THE CRAFT.

Sir,—Perhaps the following inscription from a tombstone at Broadwater, near Worthing, might interest some of your readers:—

IN
MEMORY OF
MRS. FRANCIS SMITH,
DRUGGIST,
OF WORTHING,
WHO DIED
JULY 4TH, 1837.
AGED 101 YEARS.

An old customer of Mrs. Smith remembers going into the shop sixty years ago for something for the toothache, when the old lady observed, "Now, my boy, the stuff I'm about to give you is as precious as gold, so there's but very little for twopence; but it's sure to do your mother's toothache good." I regret the name of the specific has not been preserved.

J. BURT.

M. F. S.—Most of the information you ask for is usually obtained at school, and may be found in any biographical dictionary. We are obliged for your suggestion, but do not think our readers would generally appreciate such articles as you indicate.

N.—The cloudiness and deposit you speak of probably arise from impurity of the water used in making the lemonade. The change has been noticed by Dr. Heisch in his paper on "Organic Matter in Water," an abstract of which will be found in No. 1, p. 13, of the present series.

A. W. V.—No blame could have been attached to the dispenser for using either of the mint waters, as both are officinal: we should, however, have used aq. menth. pip., as being the one commonly prescribed.

"*Vinum*" will find a letter on the subject in No. 26, p. 519.

"*Parenchyma.*"—The work mentioned is published by Messrs. Macmillan, price 4*s.* 6*d.*

"*Henley.*"—No. 2.

J. W.—We believe an apparatus similar to the one mentioned, of foreign manufacture, was introduced to the trade by Messrs. Gilbertson, of Ludgate Hill.

"*Indoctus*" has omitted to send his name.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. F. Johnson, Mr. M. C. Cooke, Mr. C. R. C. Tichborne, Mr. F. M. Rimmington, Mr. J. W. Jackson, Mr. Hustwick, Mr. J. Winser, M. F. S., J. S., N., "Delta," "Inquirer," "Aqua Pura," "Somerset," "Student."

PHARMACY IN PRUSSIA.

BY ERNEST J. T. AGNEW.

German unification being likely to assimilate all branches of technical education, a description of pharmacy in Prussia, with a few notes on its variations in the other States of the great German Empire, will, we trust, be found acceptable and interesting. A superior medical Council is held at Berlin, and provincial councils (*Regierungs-medicinal-rath*) in the chief towns of each province. Generally there is no special school or college of pharmacy; but students, as in other professions, are expected to follow the usual university courses, before which they must have undergone four years' apprenticeship, and must have been assistants to chemists for three years more before passing the final examination. An apprentice must be over fourteen years of age, and must pass a stiff examination by the *Physicus* of the district in Latin, German, and the elementary physical and natural sciences. On receiving his examination certificate he enters the service of an apothecary, who is bound to instruct him, and even to keep an herbarium of the indigenous medicinal plants for his benefit. How different to the colour-grinding and alum-powdering instruction on which most English apprentices have to base their future pharmaceutical education! On emerging from his apprenticeship, he passes before the Medical Commission, who examine him in chemistry, pharmacy, etc. This assistants' examination is certainly much more searching than the "major" of London. The final ordeal takes place when the student has reached the age of twenty-five, and is held by a special Board at the University. There are eight separate examinations, which are as follows:—

1. Written: Mineralogy, Botany and Toxicology.
2. To prepare a certain number of galenical preparations in the laboratory.
3. To prepare three chemical preparations used in pharmacy.
4. The qualitative and *quantitative* analysis of a mixture of salts.
5. The analysis of some mixture containing one or more poisons.
6. The physiological examination of drugs and medicinal plants.
7. An essay on some chemical subject, to which great importance is attached. The student is allowed every facility for references (which he has to name), and the time is unlimited. These essays are often complete monographs, and are preceded by a *curriculum vitæ* of the student.

The eighth is a *vivâ voce* and public interrogation on all pharmaceutical studies and a discussion on the essays. This last examination is passed before the whole Board, and entails many important and imposing ceremonies. In some parts of Germany there are second-class pharmacists, who pass their examinations before local boards in the chief provincial towns; but their privileges are few, and they can only establish themselves in small country towns or villages. It is easy to see that the eminent position occupied by German chemists is due to their extensive knowledge and the privileges accorded to them in consequence. The Government alone authorizes the establishment of new pharmacies; but such is the degree of opposition on the part of those already in business, that but very few are annually established, although the population of the large towns is rapidly increasing.* Berlin, with a population of 700,000, has 43 pharmacies, Pesth only 14. In Russia, by some most extraordinary anomaly, German apothecaries alone are permitted to practise, to the exclusion even of natives, unless they have been educated in a German university and possess the German diploma. Thus, in St. Petersburg there are 45 pharmacies to 532,000 inhabitants; in Moscow, 30 to 380,000, or over 12,000 persons to support a single druggist. One large shop in the former place keeps over forty assistants, and as the business consists only in dispensing, enormous fortunes are realized. The German Pharmacopœia has long been considered official in Russia; but a new Russian Pharmacopœia is about to be, if not already, issued. In Germany, as in all other countries where the number of druggists is limited, the medical commissioners fix a tariff of prices which is revised every year. At the death of a pharmacist, his widow may carry on the business until her children, should she have any, have attained their majority, by employing a duly-qualified manager. Should it, however, be left to other heirs, it must be sold within a year. Before the druggist commences business, he must take the professional oath before the *Kreis-physicus* or the university authorities.

A peculiarity of German pharmacists is the adoption of a sign. The number of Pelicans, Golden Eagles, etc. in Germany is only to be equalled by that in the Licensed Victuallers' columns of the London Post-Office Directory. In general nothing is exposed in the windows, and the interior seems redolent with professional gravity. The principal pharmacies consist of two or more rooms; the first, a kind of waiting-room for the public, who dare not penetrate into the sanctum where a number of silent and spectacled assistants dispense the prescriptions brought to them by a kind of shop-walker or "provisor," who returns them with medicines to the customers. The law compels them to write on each label the name of the medicine, that of the person for whom it is intended, how to be taken, and the date of its preparation. Coloured labels are used for poisons and external remedies. The apothecaries (as pharmacists are designated in Germany) prepare nearly all their chemicals and galenicals, for, owing to the restrictive measures in force and ensuring immense profits to the proprietors of drug-stores in large towns, nearly every pharmacy is provided with vast laboratories, containing every convenience for practice or research. Steam is commonly used for every purpose where heat is required, such as for drying, distilling and evaporating. Another reason conducing to raise the status of pharmacy in Germany is, that a great number of men possessing diplomas are unable to buy or obtain the necessary concession from the Government to establish them-

* About thirty years ago, the apothecaries at Hamburg agreed that the number of their establishments, then more than 40 to about 200,000 inhabitants, far exceeded the actual requirements of the public; in consequence of which many places scarcely enabled their owners to earn a scanty living. A society of the apothecaries of the town existed already for scientific and social meetings; and this society undertook to raise funds by annual subscriptions, and to gradually buy up the smaller establishments until the total number should be reduced to 24. This object has been carried out with such perseverance that at the present time there are less than 30 pharmaceutical establishments, although it has been found necessary to establish several new ones in recently built suburbs.—ED. PHARM. JOURN.

selves, and are consequently obliged to seek situations as managers or assistants; a staff of such painstaking, well-educated men necessarily gives a considerable *cachet* to the house they may be employed in. The inspection of pharmacies is no dead-letter in Germany, as it has proved to be in France and Italy. Here it is a long, searching operation, generally performed by two delegates in the presence of the *Kreis-physicus* of the district. It is compulsory every three years; but often judged necessary to perform it oftener. Not only are the drugs examined, but also the assistants and apprentices. The inspectors require the production of the pharmacists' diplomas, Act of Concession, tariff, herbarium of indigenous plants, prescription-books, and the prices paid for executing the formula therein. Assistants and apprentices are required to show their examination certificates, are asked questions on chemistry and pharmacy, and have to translate passages of the pharmacopœia, which is quite Celsus-like in the excellence of its Latin construction. The apprentices are bound to have certain hours allotted to them for study, and it is the inspector's duty to see that this rule has been complied with. Nearly every drug and preparation is carefully examined, and often analysed if any doubt be entertained as to their genuineness. Laboratories, stores, cellars, all are inspected most minutely. A *procès-verbal* of each visit is sent to head-quarters, where a *résumé* of it is made, and transmitted to the pharmacist, with the addition of either praiseworthy reflections, counsels for his benefit, or firm but polite reprimands. In some parts of Germany, corporations or guilds of apothecaries still exist, which Government can hardly interfere with, as they possess exclusive privileges, and do all in their power to prevent new-comers from establishing themselves. A system enjoying so many and great advantages is naturally and properly subjected to very severe legislative measures. The laws relating to the storage of poisons are so similar to those in force elsewhere, that it is useless to recapitulate them here. The German chemists enjoy great advantages and privileges, which are counterbalanced by the severest of examinations and the most searching of inspections. I am indebted for much of this legal information to M. Labélonye, of Paris, whose work on 'L'Organisation Pharmaceutique en Europe' is highly interesting and instructive.

THE CHEMICAL NOMENCLATURE OF THE PHARMACOPŒIA, WITH SUGGESTIONS FOR ITS REVISION.

BY PROFESSOR ATTFIELD.

(*Concluded from page* 804.)

The proposed Names.

The following is a table of names of all the chemical substances in the British Pharmacopœia. Column I. contains the official names; Column II. the names now suggested for employment in pharmacy, medicine and the next edition of the British Pharmacopœia; Column III. the unitary nomenclature of modern chemistry. The advantages claimed for the proposed names are that they are more consistent with each other than the old; they are formed on one uniform system instead of two; they include less of theory, and therefore have greater elements of stability than the old; and they are harmonious, whilst the old is absolutely inconsistent, with both modern scientific nomenclature and the only chemical notation now employed. Their newness, so far as they are new, is their only disadvantage, and even this disadvantage is, in practice, reduced to insignificant proportions.

Column II. also contains a few exceptional alterations, to which I shall allude subsequently.

Old Names.	*Proposed Names.*	*Synonyms.*
Acetate of ammonia.	Acetate of *ammonium.*	*Ammonium acetate.* *Ammonic acetate.*
Acetate of copper.	Acetate of copper.	*Cupric acetate.*
Acetate of iron.	Acetate of iron.	*Ferric acetate.*
Acetate of lead.	Acetate of lead.	*Lead acetate.* *Plumbic acetate.*
Acetate of morphia.	Acetate of morphia.	*Morphia acetate.*
Acetate of potash.	Acetate of *potassium.*	*Potassium acetate.* *Potassic acetate.*
Acetate of soda.	Acetate of *sodium.*	*Sodium acetate.* *Sodic acetate.*
Acetate of zinc.	Acetate of zinc.	*Zinc acetate.*
Acetic acid.	Acetic acid.	*Hydrogen acetate.* Acetic acid.
Acid tartrate of potash.	Acid tartrate of *potassium.*	*Acid potassium tartrate.*
Aconitia.	Aconitia.	Aconitia, *or aconitine.*
Albumen.	Albumen.	Albumen.
Alcohol.	Alcohol.	*Ethyl hydrate.* Alcohol, *or ethyl alcohol.*
Alum.	Alum.	Alum.
Ammonia.	Ammonia. *Hydrate of ammonium (syn.).*	Ammonia. *Ammonium hydrate.*
Ammoniated mercury.	Ammoniated mercury.	*Mercuric-ammonium chloride.*
Ammonio-nitrate of silver.	Ammonio-nitrate of silver.	*Argent-ammonium nitrate.*
Ammonio-sulphate of copper.	Ammonio-sulphate of copper.	*Cupro-diammonium sulphate.*
Ammonio-sulphate of magnesia.	Ammonio-sulphate of *magnesium.*	*Ammonio-magnesian sulphate.*
Amylic alcohol.	Amylic alcohol.	*Amyl alcohol.*
Arseniate of iron.	Arseniate of iron.	*Ferrous arsenate.*
Arseniate of soda.	Arseniate of *sodium.*	*Sodium arsenate.*
Arsenious acid.	*White arsenic.*	*Arsenious oxide.*

Old Names.	*Proposed Names.*	*Synonyms.*
Atropia.	Atropia.	Atropia, *or atropine.*
Benzoate of ammonia.	Benzoate of *ammonium.*	*Ammonium benzoate.*
Benzoic acid.	Benzoic acid.	*Hydrogen benzoate.* Benzoic acid.
Benzol.	Benzol.	*Benzene or Benzine.*
Bicarbonate of potash.	Bicarbonate of *potassium.*	*Acid potassium carbonate.* *Hydrogen potassium carbonate.* *Mono-potassie carbonate.*
Bicarbonate of soda.	Bicarbonate of *sodium.*	*Acid sodium carbonate.* *Hydrogen sodium carbonate.* *Mono-sodic carbonate.* *Hydro-sodic carbonate.*
Bichromate of potash.	*Red chromate of potassium.*	*Potassium anhydrochromate.* *Potassium bichromate.*
Bismuth.	Bismuth.	Bismuth.
Black antimony.	Black *sulphide of* antimony.	*Antimonious sulphide.*
Black oxide of manganese.	Black oxide of manganese.	*Manganese dioxide or peroxide.*
Boracic acid.	Boracic acid.	*Hydrogen borate.* *Boric acid.* Boracic acid.
Borax.	Borax.	*Sodium anhydroborate.* Borax.
Bromide of ammonium.	Bromide of ammonium.	*Ammonium bromide.*
Bromide of potassium.	Bromide of potassium.	*Potassium bromide.*
Bromine.	Bromine.	Bromine.
Calomel (syn.).	Calomel (syn.).	*Mercurous chloride.* Calomel.
Camphor.	Camphor.	Camphor.
Carbolic acid.	Carbolic acid.	*Hydrogen carbolate.* Carbolic acid.
Carbonate of ammonia.	Carbonate of *ammonium.*	*Ammonium carbonate.*
Carbonate of bismuth.	*Oxycarbonate* of bismuth (syn.).	*Bismuth oxycarbonate.*
Carbonate of iron.	Carbonate of iron.	*Ferrous carbonate.*
Carbonate of lead.	Carbonate of lead.	*Lead carbonate.* *? Triplumbic dihydrate diearbonate.*
Carbonate of lime.	Carbonate of *calcium.*	*Calcium carbonate.*
Carbonate of lithia.	Carbonate of *lithium.*	*Lithium carbonate.*
Carbonate of magnesia.	Carbonate of *magnesium.*	*Magnesium earbonate.* *? Tetrahydrous dihydric tetramagnesic tricarbonate.*
Carbonate of potash.	Carbonate of *potassium.*	*Dipotassic carbonate.* *Potassium carbonate.*
Carbonate of soda.	Carbonate of *sodium.*	*Disodic carbonate.* *Sodium carbonate.*
Carbonate of zinc.	Carbonate of zinc.	*Zinc carbonate.*
Caustic potash.	Caustic potash. *Hydrate of potassium (syn.).*	Caustic potash. *Potassium hydrate.*
Caustic soda.	Caustic soda. *Hydrate of sodium (syn.).*	Caustic soda. *Sodium hydrate.*
Chalk.	Chalk.	*Calcium carbonate.* Chalk.
Chlorate of potash.	Chlorate of *potassium.*	*Potassium chlorate.*
Chloride of ammonium.	Chloride of ammonium.	*Ammonium chloride.*
Chloride of antimony.	Chloride of antimony.	*Antimony trichloride.* *Antimonious chloride.*
Chloride of barium.	Chloride of barium.	*Barium chloride.* *Baric chloride.*
Chloride of calcium.	Chloride of calcium.	*Calcium chloride.* *Calcic chloride.*
Chloride of gold.	*Per*chloride of gold.	*Auric chloride.*
Chloride of sodium.	Chloride of sodium.	*Sodium chloride.*
Chloride of tin.	*Stannous chloride.*	*Stannous chloride.*
Chloride of zinc.	Chloride of zinc.	*Zinc chloride.*
Chlorinated lime.	Chlorinated lime.	*Chloride of lime.*
Chlorinated soda.	Chlorinated soda.	*Chloride of soda.*
Chlorine.	Chlorine.	Chlorine.
Chloroform.	Chloroform.	*Methenyl chloride.* Chloroform.
Citrate of ammonia.	Citrate of *ammonium.*	*Ammonium citrate.*
Citrate of bismuth and ammonia.	Citrate of bismuth and *ammonium.*	*Bismuth ammonio-citrate.* *Ammonium and bismuthous citrate.*
Citrate of iron and ammonia.	Citrate of iron and *ammonium.*	*Ferric ammonio-citrate.* *Ferric and ammonium citrate.*
Citrate of iron and quinia.	Citrate of iron and quinia.	*Ferric quinio-citrate.* *Quinia ferri-citrate.* *Ferric and quinia citrate.*

Old Names.	*Proposed Names.*	*Synonyms.*
Citrate of lithia.	Citrate of *lithium.*	*Lithium citrate.*
Citrate of potash.	Citrate of *potassium.*	*Potassium citrate.*
Citric acid.	Citric acid.	{ *Hydrogen citrate.* Citric acid.
Citro-tartrate of soda.	Citro-tartrate of *sodium.*	*Sodium citro-tartrate.*
Conia.	Conia.	Conia *or conine.*
Copper.	Copper.	Copper.
Corrosive sublimate (syn.).	Corrosive sublimate (syn.).	{ *Mercuric chloride.* Corrosive sublimate.
Digitalin.	Digitalin.	Digitalin.
Dried alum.	Dried alum.	Dried alum.
Dried carbonate of soda.	Dried carbonate of *sodium.*	Dried *sodium carbonate.*
Dried sulphate of iron.	Dried sulphate of iron.	Dried ferrous sulphate.
Ether.	Ether.	{ *Ethyl oxide.* Ether.
Ferrocyanide of potassium (syn.).	Ferrocyanide of potassium.	*Potassium ferrocyanide.*
Gallic acid.	Gallic acid.	{ *Hydrogen gallate.* Gallic acid.
Gelatine.	Gelatine.	Gelatin.
Glycerine.	Glycerine.	{ *Propenyl alcohol.* Glycerin.
Granulated sulphate of iron.	Granulated sulphate of iron.	Granulated *ferrous sulphate.*
Hydrated peroxide of iron.	*Peroxyhydrate of iron.*	*Ferric oxyhydrate.*
Hydrochlorate of morphia.	Hydrochlorate of morphia.	*Morphine hydrochlorate.*
Hydrochloric acid.	Hydrochloric acid.	{ *Hydrogen chloride.* *Chlorhydric acid.* Hydrochloric acid.
Hydrochloric sol. of arsenic.	Hydrochloric sol. of arsenic.	Hydrochloric sol. of arsenic.
Hydrocyanic acid.	Hydrocyanic acid.	{ *Hydrogen cyanide.* Hydrocyanic acid.
Hyposulphite of soda.	Hyposulphite of *sodium.*	*Sodium hyposulphite.*
Indigo.	Indigo.	Indigo.
Iodate of potash.	Iodate of *potassium.*	*Potassium iodate.*
Iodide of cadmium.	Iodide of cadmium.	*Cadmium iodide, or cadmic iodide.*
Iodide of iron.	Iodide of iron.	*Ferrous iodide.*
Iodide of lead.	Iodide of lead.	*Lead iodide, or plumbic iodide.*
Iodide of mercury, green.	Iodide of mercury, green.	*Mercurous iodide.*
Iodide of mercury, red.	Iodide of mercury, red.	*Mercuric iodide.*
Iodide of potassium.	Iodide of potassium.	*Potassium iodide.*
Iodide of sulphur.	Iodide of sulphur.	*Sulphur iodide.*
Iodine.	Iodine.	Iodine.
Iron.	Iron.	Iron.
Lime.	Lime.	{ *Calcium monoxide.* Lime.
Magnesia.	Magnesia.	{ *Magnesium oxide.* Magnesia.
Magnetic oxide of iron.	Magnetic *oxyhydrate* of iron (syn.).	*Ferroso-ferric oxyhydrate.*
Mercury.	Mercury.	Mercury.
Mercury with chalk.	Mercury with chalk.	Mercury with chalk.
Moist peroxide of iron.	Moist *perhydrate* of iron.	*Ferric hydrate.*
Nitrate of lead.	Nitrate of lead.	*Lead nitrate.*
Nitrate of mercury.	*Per*nitrate of mercury.	*Mercuric nitrate.*
Nitrate of potash.	Nitrate of *potassium.*	*Potassium nitrate.*
Nitrate of silver.	Nitrate of silver.	{ *Argentic nitrate.* *Silver nitrate.*
Nitrate of soda.	Nitrate of *sodium.*	*Sodium nitrate.*
Nitric acid.	Nitric acid.	{ *Hydrogen nitrate.* Nitric acid.
Nitro-hydrochloric acid.	Nitro-hydrochloric acid.	Nitro-hydrochloric acid.
Nitrous ether, spirit of.	Nitrous ether, spirit of.	{ *Ethyl nitrite, spirit of.* Nitrous ether, spirit of.
Oxalate of ammonia.	Oxalate of *ammonium.*	*Ammonium oxalate.*
Oxalate of cerium.	Oxalate of cerium.	*Cerous oxalate.*
Oxalic acid.	Oxalic acid.	{ *Hydrogen oxalate.* Oxalic acid.
Oxide of antimony.	Oxide of antimony.	{ *Antimony trioxide.* *Antimonious oxide.*
Oxide of iron, magnetic.	*Oxyhydrate* of iron, magnetic (syn.).	*Ferroso-ferric oxyhydrate.*
Oxide of lead.	Oxide of lead.	*Lead oxide, or plumbic oxide.*
Oxide of mercury, red.	Oxide of mercury, red.	*Mercuric oxide.*
Oxide of silver.	Oxide of silver.	{ *Silver monoxide.* *Argentic oxide.*
Oxide of zinc.	Oxide of zinc.	*Zinc oxide.*
Perchloride of iron.	Perchloride of iron.	*Ferric chloride.*
Perchloride of mercury.	Perchloride of mercury.	*Mercuric chloride.*

Old Names.	*Proposed Names.*	*Synonyms.*
Perchloride of platinum.	Perchloride of platinum.	*Platinum tetrachloride.* *Platinic chloride.*
Permanganate of potash.	Permanganate of *potassium.*	*Potassium permanganate.*
Pernitrate of iron.	Pernitrate of iron.	*Ferric nitrate.*
Peroxide of iron, hydrated.	*Peroxyhydrate of iron (syn.).*	*Ferric oxyhydrate.*
Peroxide of iron, moist.	*Perhydrate of iron, moist.*	*Ferric hydrate.*
Persulphate of iron.	Persulphate of iron.	*Ferric sulphate.*
Phenic acid (syn.).	Phenic acid (syn.).	*Hydrogen phenate.* Phenic acid.
Phosphate of ammonia.	Phosphate of *ammonium.*	*Ammonium phosphate.*
Phosphate of iron.	Phosphate of iron.	*Ferrous phosphate.*
Phosphate of lime.	Phosphate of *calcium.*	*Calcium orthophosphate.*
Phosphate of soda.	Phosphate of *sodium.*	*Disodiohydric phosphate.*
Phosphoric acid.	Phosphoric acid.	*Hydrogen phosphate.* Phosphoric acid.
Phosphorus.	Phosphorus.	Phosphorus.
Platinum.	Platinum.	Platinum.
Potash, solution of.	Potash, solution of.	Potash, solution of.
Prussiate of potash, red.	? Prussiate of *potassium,* red.	*? Red potassium prussiate.*
Prussiate of potash, yellow.	? Prussiate of *potassium,* yellow.	*? Yellow potassium prussiate.*
Reduced iron.	Reduced iron.	*Reduced iron.*
Santonin.	Santonin.	*Santonin.*
Slaked lime.	Slaked lime.	*Calcium hydrate.* Slaked lime.
Soda, solution of.	Soda, solution of.	Soda, solution of.
Starch.	Starch.	Starch.
Strychnia.	Strychnia.	Strychnine.
Subacetate of copper.	*Oxyacetate* of copper (syn.).	*Cupric oxyacetate.*
Subacetate of lead.	*Oxyacetate* of lead (syn.).	*Basic lead acetate.* *Lead oxyacetate.*
Subchloride of mercury.	Subchloride of mercury.	*Mercurous chloride.*
Subnitrate of bismuth.	*Oxynitrate* of bismuth (syn.).	*Basic bismuth nitrate.* *Bismuth oxynitrate.*
Sugar.	Sugar.	Sugar.
Sulphate of atropia.	Sulphate of atropia.	*Atropine sulphate.*
Sulphate of beberia.	Sulphate of beberia.	*Beberine sulphate.*
Sulphate of copper.	Sulphate of copper.	*Cupric sulphate.*
Sulphate of indigo.	Sulphate of indigo.	*Sulphindigotic acid.*
Sulphate of iron.	Sulphate of iron.	*Ferrous sulphate.*
Sulphate of lime.	Sulphate of *calcium.*	*Calcium sulphate.*
Sulphate of magnesia.	Sulphate of *magnesium.*	*Magnesium sulphate.*
Sulphate of mercury.	*Per*sulphate of mercury.	*Mercuric sulphate.*
Sulphate of potash.	Sulphate of *potassium.*	*Potassium sulphate.*
Sulphate of quinia.	Sulphate of quinia.	*Quinine sulphate.*
Sulphate of soda.	Sulphate of *sodium.*	*Sodium sulphate.*
Sulphate of zinc.	Sulphate of zinc.	*Zinc sulphate.* *Zincic sulphate.*
Sulphide of ammonium.	*Sulphydrate* of ammonium.	*Ammonium sulphydrate.*
Sulphide of iron.	Sulphide of iron.	*Ferrous sulphide.*
Sulphur.	Sulphur.	Sulphur.
Sulphurated antimony.	Sulphurated antimony.	*Antimonious oxysulphide.*
Sulphurated potash.	Sulphurated potash.	Sulphurated potash.
Sulphuretted hydrogen.	Sulphuretted hydrogen.	Sulphuretted hydrogen.
Sulphuric acid.	Sulphuric acid.	Sulphuric acid. *Hydrogen sulphate.*
Sulphurous acid.	Sulphurous acid.	Sulphurous acid. *Hydrogen sulphite.*
Tannic acid.	*Tannin (syn.).*	*Tannin.*
Tartar emetic (syn.).	Tartar emetic (syn.).	Tartar emetic.
Tartarated antimony.	*Tartrate of antimony and potassium.*	*Potassio-antimonious tartrate.*
Tartarated iron.	*Tartrate of iron and potassium.*	*Potassio-ferric tartrate.*
Tartarated soda.	*Tartrate of sodium and potassium.*	*Potassio-sodium tartrate.*
Tartaric acid.	Tartaric acid.	Tartaric acid. *Hydrogen tartrate.*
Tartrate of potash.	Tartrate of *potassium.*	*Potassium tartrate.* *Dipotassic tartrate.*
Tin.	Tin.	Tin.
Valerianate of soda.	Valerianate of *sodium.*	*Sodium valerianate.*
Valerianate of zinc.	Valerianate of zinc.	*Zinc valerianate.*
Veratria.	Veratria.	Veratrine.
Verdigris.	Verdigris.	Verdigris.
Water.	Water.	Water.
Zinc.	Zinc.	Zinc.

Résumé.—The chief alterations in pharmacopœial nomenclature now proposed amount to this, that the compounds of the alkali-metals and alkaline-earth-metals instead of being named as hitherto on two distinct systems, should follow but one:—that instead of salts of potassium and of potash we should have salts of potassium only; instead of sodium and soda compounds, sodium only; and so with preparations of ammonium, lithium, calcium, magnesium and aluminium. This is a step in the direction of simplicity and permanency, and away from that of theory.

Synonyms.—Modern scientific chemical names, and the old dualistic names should, I think, be included as synonyms of the leading names in all Pharmacopœias. Many might be mentioned in addition to those in the third column: I have given a selection because the complete and consistent sets (for, unfortunately, there are more than one) would have occupied too much space.

Exceptional Alterations.— Constitutional objections to the name *acidum arseniosum* would be obviated by the old name *arsenicum album*. Some other bodies, apparently similar in constitution to white arsenic, are alluded to in the text of the British Pharmacopœia as *anhydrous acids*—a most ambiguous and self-contradictory term; for the bodies in question either are acids or they are not acids; whereas the term indicates that they are both—which is impossible. The not very satisfactory word "anhydride" is coming generally into use for these bodies, and this might be employed officially; but all objection would be avoided if the strength of the pharmacopœial acids, which are mostly aqueous solutions of acids, were solely given in terms of real acid (the hydrogen salt). The correlative of the word *anhydrous*, I would suggest, should be *hydrous*, never *hydrate*; especially as the latter word is now given to the members of a class of bodies derived from water, as *hydrate of potassium*, and not to bodies containing water. The compound from which *anhydrous sulphate of copper* is prepared is *hydrous sulphate of copper*, not *hydrated sulphate of copper*. In view of the peculiar composition of *bichromate of potassium* the first word of its name is most unsuitable, and would be advantageously replaced by *red chromate*, a name which would usefully distinguish the salt from *yellow chromate of potassium*. The names of the bismuth powders are not at present consistent with each other; if the one be termed *subnitrate* the other should be *subcarbonate*, not "*carbonate*." But these preparations and the similar compounds of copper and lead are normal rather than "sub" salts, containing oxygen in the place of an exactly equivalent quantity of the acidulous radical of the neutral salts, and might well be termed respectively *oxycarbonate of bismuth, oxynitrate of bismuth, oxyacetate of copper, oxyacetate of lead*; at all events the latter names would do good service as synonyms. Similar remarks apply to the *peroxhydrates of iron*. The prefix "sub" is most usefully and indeed indispensably applied in the case of calomel, which is the "lower" or under-chloride of mercury: it would be well if the meaning of the syllable could be always thus restricted to its etymological signification, and never again used in its old conventional sense. The names *tartarated antimony, tartarated iron, tartarated sodium*, I do not like at all. The sister terms *sulphurated antimony* and *sulphurated potash* are most happy, their utter vagueness fairly representing the nondescript character of the preparations. But *tartrate* (or *oxytartrate*) *of antimony and potassium, tartrate of iron and potassium*, and *tartrate of sodium and potassium*, are at least as definite in composition as the citric trio which are already honoured with the definite names (or, rather, with the old forms of the names) *citrate of bismuth and ammonium, citrate of iron and ammonium* and *citrate of iron and quinia*. "Prussiates" might now, I think, be relegated to the synonymic category. Instead of *Liquor Sodæ Effervescens*, B. P., which might possibly be confounded with *Liquor Sodæ*, I would prefer *Aqua Sodæ Effervescens*, and so with *Potash Water*. These are the prominent exceptional alterations to which I would draw attention. Their acceptance is not insisted on, nor is the list exhaustive. Allusion is made to them in the hope that discussion may show which names, on the whole, possess the greatest number of advantages. The alterations I do urge are those considered in the main portion of this paper, those of which I have already given a *résumé*.

In conclusion, I would state that the Lavoisierian names now proposed for use in medicine and pharmacy have already been freely adopted by many authors, and used as the leading nomenclature of my own and some other Manuals of Chemistry. I commend them to the medical practitioners and pharmacists of Europe, America and the Colonies.

THE PROPOSED POISON REGULATIONS.

MEETING AT GLASGOW.

A Special General Meeting of the chemists of Glasgow and West of Scotland (convened by the officers of the Glasgow Association) was held in the West Hall, Anderson's University, on Monday, 3rd inst., at 12 o'clock noon. Mr. Thomas Davison, President of the Glasgow Association, was called upon to preside.

The Chairman read the circular calling the meeting, and the proposed regulations. These, he thought, sufficiently explained the object for which they were met, while the resolutions to be proposed, if adopted unanimously, would be regarded as expressive of the opinion of the chemists of this important district. He would have preferred that some person who could have maintained a more neutral attitude should have been appointed chairman of this meeting, as he felt that the result might be looked upon as a foregone conclusion. The proposed regulations were put forth for the avowed object of securing the safety of the public, but if so, he could not see why surgeon-druggists should be exempted, and more especially in Glasgow and Paisley, where medical practitioners had by far the largest share of dispensing. He contended that in Scotland generally there were few cases of poisoning from carelessness on the part of chemists, and even in England they were comparatively few. He therefore thought there was no necessity for the safety of the public being guaranteed by any such regulations as those proposed. He further thought it was quite clear that if the chemists accepted the regulations, they would be continually interfered with. If the Pharmacy Act of 1868 had been adopted in its entirety, the result would have been that all surgeons who kept open shop would have had to get themselves registered under the Act as chemists and druggists; they then would have been liable to the same restrictions. But the Amended Act of 1869, he believed, was intended for no other purpose than to have medical practitioners entirely exempted from the operations of the Act of 1868, and any one who reads it carefully will see that it was intended that medical men were *not* to be interfered with in their capacity as dispensers, if they chose to carry on a dispensing trade. He himself had had some communication with the medical department of the Privy Council, in the course of which he showed the position in which the Glasgow chemists would be placed, and requested them to take steps to put all on an equality; the reply he received was to the effect, that if an opportunity occurred for such legislation, his suggestion would be taken into consideration. He thought if the opportunity were given by the Society rejecting the regulations, we should hear no more of them, as the medical men who kept open shops would object far more strongly than chemists against any compulsory enactments.

Mr. John Jaap, Pharmaceutical Chemist, moved the first resolution:—"That this meeting is opposed to the restrictive measures for the sale and keeping of 'poisons,' recommended by the Council of the Pharmaceutical Society (with consent of the medical officers of her Majesty's Privy Council) for adoption at the annual meeting in May next, as we consider it is highly impolitic to interfere in any way with the conducting of our business otherwise than as recommendations; and being convinced that the greatest security for the public lies in the education of the dispenser, and such education being now not only improved, but made a necessary qualification, is to all intents and purposes a guarantee of our ability to conduct our business for the public safety." Mr. Jaap said he had nothing to add to the resolution, as it fully expressed his opinions on the matter.

Mr. Daniel Frazer, Pharmaceutical Chemist, in seconding the resolution, confessed that he did so with no hesitancy, because he held very decided opinions on the subject. He, however, thought it necessary that there should be means taken by all chemists to distinguish poisons which resembled each other in appearance. He would go further, and say that the public should have some security against accidents happening. But he wished to be at liberty to accomplish that object himself, as best suited his circumstances, without any undue interference on the part of the Privy Council; he also wished his brethren in the trade to be on the same footing, for he could not believe that there were many chemists, if any, who would be careless enough to keep morphia, arsenic or tartarized antimony on the same shelf with bicarbonate of soda or powdered sugar. He thought that a separation of such poisonous articles,—some on high shelves, others among liquids, and poisonous liquids among solids,—was all that was necessary.

Mr. Glen (Renfrew), in supporting the motion, said the proposed regulations would be gross injustice to them, who had already taken steps in the matter, and had endeavoured to protect the public and themselves from any injury arising out of accidents with poisonous drugs.

Mr. Alexander Kinninmont, Pharmaceutical Chemist, moved the second resolution as follows:—"That this meeting is further opposed to the proposed compulsory regulations, as their adoption by the Society in their present form will tend to give an undue and invidious advantage to one class of retailers over another,—creating, in fact, a body of 'privileged traders;' for, while the regulations will be binding *only* on those registered under the Pharmacy Act, all persons registered under the Medical Acts will be exempted, and at liberty to act as they think proper,—it being the custom of many medical practitioners throughout the country to keep open shop and carry on a retail trade in the same manner as chemists and druggists, and as especially in this city fully two-thirds of the drug retailers are physicians." Mr. Kinninmont said he thought there was little to add to the resolution. Chemists generally did not want to interfere with medical men, even in dispensing, if they dispensed only their own prescriptions; but all felt it to be an anomaly that, in a city such as Glasgow, out of 180 retailers of drugs, 120 of those belonged to medical practitioners, and that, if the regulations were enforced, those 120 would be at liberty to adopt them or not as they liked, while the remaining 60 would be compelled to do so; and yet there was, practically speaking, no difference between their establishments and the conducting of their business. He therefore held that, if the regulations were to be enforced, they should not be applied to one class alone, but to all engaged in the dispensing and selling of poisons.

Mr. D. P. Walker seconded the motion, and said he thought it was now time that the dispensing of medicines should be taken out of the hands of the medical practitioners altogether, for he thought it was a disgrace to a city like Glasgow, that boys of eight or twelve years of age, and sometimes girls, were all that could be seen at the back of the counters of these doctors' shops from morning till night. He thought that the Council of the Pharmaceutical Society had entirely mistaken whom the regulations were needed for. It was in shops of this description where they were required.

Mr. Black wished to know whether all who kept open shop for the sale of poisons were not equally liable to the same restrictions as chemists.

Mr. Harvie (Airdrie) said he thought he could supply the desired information. He had always been of opinion that medical men who kept open shop came under the poison clauses of the Pharmacy Act, the same as druggists, which to all intents and purposes they were, so far as the sale of poisons is concerned at least, and he naturally thought they should act in the sale of poisons the same as they who were professed druggists; but, while he held this opinion, a medical man who had a shop near him, thought differently, and said he would sell as much poison as he could, and would register none of it. He (Mr. Harvie) told the doctor that if he persisted in doing so he would make a case of it, while the doctor said he was quite agreeable. A party called shortly afterwards at his shop for half an ounce of corrosive sublimate; he not knowing the person, asked him to bring a witness whom he knew; the man said he needed no witness and could get it at Dr. So-and-So's. He (Mr. Harvie) advised him not to go there without a witness either, or if he did, the consequences might be serious to himself; the man paid no attention however, but went straight to the doctor's shop to which he followed him, and witnessed the doctor weigh the stuff, wrap it up in paper and hand over the counter *without even a label;* he called a policeman at once, gave the man in charge and lodged the case with the procurator-fiscal. The fiscal wrote to Edinburgh for instructions, and in a day or two a reply came from Mr. Kimberly, giving orders not to proceed with the case; it was thus decided in favour of the doctor, and he continues to sell poisons without registering them, and, in many cases, not even labelling them.

Mr. John Currie, Pharmaceutical Chemist, proposed the third motion, as follows:—"That this meeting being convinced that it is impossible to frame a set of rules equally suited to the varied requirements of different pharmaceutical establishments, and because we feel that no restrictions under the authority of the law are likely to prove successful, we hereby resolve to give the proposed *compulsory* regulations our most strenuous opposition, while we will respectfully consider any well-devised scheme, if sent out as a recommendation, and act in accordance therewith, so far as our circumstances will permit." He said that the best security to the public against mistakes from the sale of poisons is, first, the exercise of sound discretion on the part of the dispenser as to whom poisons should be sold to, when not prescribed by a physician; secondly, by the adopting of a uniform rule of labelling everything carefully and by affixing on mixtures, etc., for internal use and containing ingredients of a dangerous nature in an overdose, a label, 'poisonous in an overdose;' and on liniments, lotions, embrocations, etc., 'for external use only,' together with a 'poison' label in red ink, if made up of dangerous compounds.

Mr. HAMILTON, M.P.S., seconded the motion. He said that one great objection he had to the action of the Council, was the persistent manner in which they had brought the regulations forward without first consulting the feelings or wishes of the entire trade; of course the final decision was left to the members of the Society at their Annual Meeting, but it would have spared the members a great deal of anxiety, not to say of expense, had their proposition not been so arbitrary.

Mr. GLEN (Renfrew) supported the resolution.

Mr. JOHN BLACK moved the fourth resolution as follows:—"That an Association be formed to be called 'The West of Scotland Chemists' Defence Association,' to co-operate with other similar organizations in opposing all compulsory and partial legislation; that every contributor of 2*s.* 6*d.* and upwards be a member, and that a general committee be appointed to have full powers to adopt such means as they may think necessary to attain the object of the Association." Mr. Black said he thought they would all see the necessity for having a standing committee to watch over their interests, even although the regulations were rejected at the forthcoming meeting in May.

Mr. J. M. FAIRLIE, M.P.S., said he would have preferred to have sat a silent listener, but a desire to refute some of the arguments put forth lately in support of the regulations must be his excuse. Mr. Abraham, of Liverpool, and others, had said that an understanding was come to with Parliament during the passing of the Pharmacy Act in 1868, that regulations were necessary. He himself remembered well the passing of the Act, and also the poison clauses that were tried at the time to be inserted into it, but when they were withdrawn, he thought it was that we should hear no more of them. As to the statement that it was then understood that the Pharmaceutical Society was the proper party to make such regulations, it seemed to him an excuse for getting them conveniently shelved.

Mr. CARR (Dumbarton) supported the resolution.

Mr. GREIG moved that the following gentlemen constitute the committee, with power to add to their number, viz., Messrs. D. Frazer, Jaap, Kinninmont, Black, Davison, Currie, Hamilton, Alexander, Walker, Harvie, Borland Moore, Carr, Fairlie and Hart, Mr. Davison, convener.

Mr. MOORE, Pharmaceutical Chemist (Stirling), seconded the motion.

Mr. ALEXANDER, Pharmaceutical Chemist (Greenock), moved the sixth resolution as follows:—"That the Committee be entrusted to prepare a memorial embodying the foregoing resolutions, which all chemists in the district shall have an opportunity of signing, and present it to the members of the Pharmaceutical Society at their Annual Meeting in May, and also to the medical department of the Privy Council." Mr. Alexander supported his resolution in a lengthy and interesting speech, in course of which he showed that the comparatively few accidents that arose through carelessness on the part of the dispenser, and especially as there had been less accidents since the passing of the Act, there was no need for further legislation in that direction. He thought that the Council should turn their attention a little to a proper definition of who should sell and who should *not* sell drugs. He knew that in England many hucksters made a regular practice of travelling through the country, selling drugs along with their other merchandise.

Mr. HARVIE (Airdrie) seconded the motion.

A general conversation then took place with reference to other points involved in the proposed regulations (in which Mr. BORLAND, Pharmaceutical Chemist, Kilmarnock, took an active part), at the close of which the CHAIRMAN put the various motions to the meeting, which were unanimously agreed to, and, on the motion of Mr. CARR (Dumbarton), a hearty vote of thanks to Mr. Davison for presiding brought the proceedings to a close.

REGULATIONS

(FRAMED IN PURSUANCE OF HER MAJESTY'S ORDER IN COUNCIL OF THE 4TH JUNE, 1870) FOR AN OPEN COMPETITIVE EXAMINATION FOR THE SITUATION OF ASSISTANT DISPENSER IN HER MAJESTY'S NAVAL ESTABLISHMENTS.

1. The examination will be in the following subjects, viz.:—
   1. Handwriting.
   2. Orthography.
   3. Arithmetic (to vulgar and decimal fractions).
   4. English Composition.

NOTE.—Candidates will be required to show that they possess the Minor* qualifications of the Pharmaceutical Society, and they must satisfy the Civil Service Commissioners on this point before they can be admitted to the competition.

2. A fee of 7*s.* 6*d.* will be required from each candidate attending the examination.

3. No candidate will be eligible whose age on the first day of the competitive examination is less than 20 or more than 25.

Civil Service Commission, 29th March, 1871.

An open competition will be held in London, under the above regulations, on Tuesday, April 25. Five persons will be selected, if so many should be found qualified; two to fill vacancies* now existing at Jamaica and Ascension Naval Hospitals, and three to fill, in order of merit, the next vacancies that may occur while they are eligible in respect of age.

The daily pay is as follows:—

Under 5 years' service.	Under 8 years' service.	Under 11 years' service.	Under 14 years' service.	Under 17 years' service.	Under 20 years' service.
5*s.*	5*s.* 6*d.*	6*s.*	6*s.* 6*d.*	7*s.* 6*d.*	8*s.* 6*d.*

and for every additional year an addition of 6*d.* per diem till 10*s.* a day is reached. When in charge of stores an additional allowance will be granted, viz. 1*s.* per day. An allowance of 6*d.* a day in lieu of food and light and quarters will be provided.

Superannuation will be allowed in accordance with the Superannuation Act of 1859. Assistant dispensers will not be eligible for promotion to the rank of dispenser, or to be placed in charge of stores, until they have obtained the Major qualifications of the Pharmaceutical Society.

Persons wishing to be admitted to the examination must fill up the annexed form, and return it so as to reach the Civil Service Commission on or before April 15th. An order for examination will then be sent to them in due course.

FORM OF APPLICATION.

To the Secretary, Civil Service Commission.

Sir,—I hereby apply for permission to attend the examination to be held in London on the 25th April for the situation of assistant-dispenser in her Majesty's naval establishments, under the regulations of 29th March, 1871.

If I should be successful in the competition, I shall be prepared to satisfy the Civil Service Commissioners that my age on the 25th April, 1871, was not under 20 nor above 25; that my health and character are such as to fit me for public employment; and that I possess the Minor qualifications of the Pharmaceutical Society.

Name in full_______________

Address in full_______________

Date_______________

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* As the persons who may be appointed to these two vacancies will be in charge of stores, no one will be eligible for them who does not possess the Major qualifications of the Pharmaceutical Society.

The Pharmaceutical Journal.

SATURDAY, APRIL 15, 1871.

POISON REGULATIONS.

From the report of the proceedings at the late meeting of the Council, it will be seen that there was ground for the statement made in anticipation last week as to the removal of any reason for the continuance of such hostile action as we have with regret seen commencing within the last few weeks. Since then we have received a letter on the subject from Mr. Sandford, and as the resignation of the President is an exceptional circumstance, we insert it here. We do not doubt that even those who differ from Mr. Sandford will recognize the strength of the convictions which have guided his action, and we believe that all will agree with him as we do in deprecating anything like personal contention.

"TO THE EDITOR OF THE 'PHARMACEUTICAL JOURNAL.'

"Sir,—In your Journal of last week you announce my resignation of the Presidency, '*which followed immediately on the carrying of Mr. Dymond's amendment.*'

"It is not to disconnect the one circumstance from the other that I desire to address some words of explanation through you to my fellow-members, but to show them that the same devotion to the interest of the Pharmaceutical Society which has animated me for so many years past, has impelled me in my present course.

"When the Government insisted on introducing into the Bill of 1868 the principle of regulations as to the keeping, dispensing and selling of poisons, two courses were open to us; either to accept the duty of framing those regulations for ourselves, or to allow the power of doing it to be placed in other hands,—in the hands, perhaps, of men utterly unacquainted with our business. I need scarcely say the former course was accepted as by far the best arrangement. In 1869 the Council, feeling that the time had arrived for action, with great care and deliberation framed the regulations about which we have had so much controversy, and submitted them to the Privy Council, in order that there might be harmonious action in the event of the Society agreeing to them; they were accordingly brought before the general meeting in May last.

"Time rolled on, and desiring to know before the meeting of Parliament what steps the Pharmaceutical Society had taken in the matter, the medical officer of the Privy Council wrote to the Registrar for information. Again the approved code was brought before our Council and repeatedly confirmed by overwhelming majorities. But the opponents, although in minority at the Board, had a good cry for the country,—for nothing stirs up the minds of men more than the information, whether true or untrue, that their liberties are about to be trampled on,—and a wild, unreasoning clamour was raised on a mere sentimental grievance. I say a sentimental grievance, because on all hands we find the very precautions we proposed have been in use (and, for the matter of that, were proposed because they had been in use) in many establishments throughout the country. The regulations in themselves have been declared good, but their compulsory observance altogether unbearable. No man courts personal restrictions, just, perhaps, as no man pays taxes for the mere love of paying, but men consent to pay taxes and to conform to laws as a duty to their fellow-men; therefore, although the task of opposing seems to have become almost a pleasure, I believe throughout the length and breadth of the land, many of our best and wisest members, although naturally silent, would have cheerfully submitted to the *terrible restrictions* (!) which were being prepared for them. In this belief, Sir, I was not shaken by the 'tall talk' resounding about us, and for that reason felt it my duty still to support the introduction to the Annual Meeting of the regulations as compulsory; not without hope that when calmly deliberating on our position, the Society would have risen to a sense of the duty it had undertaken when great privileges were accorded to it, and in the full confidence that when such a step had been taken, no charge of neglect, and consequently no plea for foreign interference, could be brought against us. It was, therefore, according to my judgment, in the best interest of the Society that I laboured, and at last laboured alone.

"In the discussion arising on Mr. Dymond's motion, I had the great satisfaction of hearing from those gentlemen with whom I had voted during two long and trying years, that their opinions remained unchanged although their votes were now to be given in an exactly contrary direction. Time will prove whether other parties than those who best understand the matter will not try their hands at the work which we have just abandoned, and if they do, I for one shall be unable to say, 'Gentlemen, there is no cause for interference.'

"It should be remembered that the tendency of the present day is to departmental action in the executive. That which was formerly the business of any Government office now becomes the duty of one, and is consequently more narrowly looked after.

"Matters concerning the public health seem to have fallen to the Privy Council, and more immediately to the medical department of that Council. Any man who reads the periodical reports issuing therefrom, must be at once convinced of the extreme activity of the heads of that department, and with an active official to guide them and a large majority in the House of Commons, Ministers may succeed sooner than is expected in doing that which they had entrusted—with misplaced confidence they will say—to our hands. The question before us is entirely apart from 'free-trade'; it is one of public protection.

"Thus much, Sir, for my persistent perseverance in an unpopular course, for my seeming disregard of the wishes of many men who had shown me so much kindness, showered on me so many honours.

"And now for my withdrawal at the moment of defeat from the high office I had held so long. I resumed that office in June last under very difficult circumstances. Death had deprived me of my partner, and I could no longer spare time from my own business to watch the interests of the Society as they should be watched. At Christmas I had determined to vacate the chair, but then arose the clamour which I felt must render the office of President a most unpleasant one, and I could not in honour leave such a bed of thorns to a successor. I told you in a former letter that I simply held on for this reason. The moment the vote of the Council extinguished the compulsory regulations I felt at liberty, and availed myself of that liberty, to retire. It may be asked why I retired when but a few weeks would have relieved me of the duty? And here again, Sir, I felt that in doing so I best advanced the interest and honour of the Society. I hold that the President, who is constantly called on to act on behalf of the Council, should fairly and faithfully represent its opinion; and I could not fail to see that when my hand, and mine alone, was held up to support a particular line of action in regard to the vital question of the year, I had ceased to be in accord with my fellow-councillors—therefore retirement was the only honourable course open to me.

"You doubtless rejoice that the pages of your Journal will no longer be encumbered by this controversy, to the exclusion of more valuable matter; that contention in our body will cease, and I heartily join you in that view; but I may say at parting that it has puzzled me sorely to discover why there should ever have been anything approaching to *personal* contention. The question was one on which men were quite entitled to differ, but it was one to be settled solely by *the votes of the Society, not by the Council*, who would only have presented the regulations to the Society with a recommendation that it would be wise and politic to adopt them rather than bring the Pharmaceutical Society into antagonism with the public as represented in Parliament.

"George W. Sandford.

"47, *Piccadilly*, *April* 10, 1871."

We have also received from the Honorary Secretary of the "Metropolitan Chemists' Defence Association" a copy of the circular addressed to Registered Chemists who "have no vote at the meetings of the Pharmaceutical Society," together with a tatement of the resolutions passed at the meeting held on the 20th ult., and a memorial for signature and presentation to the Pharmaceutical Society—at the annual meeting in May—expressive of disapproval of "compulsory legislative enactment" in regard to regulations for the Storing and Dispensing of Poisons. However, the opposition to the Pharmaceutical Society suggested by this memorial is no longer possible even in appearance. We congratulate the Association that in this respect its occupation is gone, and that there is no longer any need to publish the memorial.

This is also, to a great extent, the case as regards the meeting at Glasgow on the 3rd inst.; but we publish that report, since it illustrates the sore grievance of "medical druggists," already mentioned in our last number as having attained most serious proportions in that city. Here would, indeed, seem to be a very fitting opportunity for exercising the regulative action of the Privy Council. This grievance is one which merits the attention of the whole trade, and it is sufficiently general to call for the endeavours of all pharmacists to put an end to it.

There is one point in the circular of the Metropolitan Chemists' Defence Association that we cannot omit to notice, and that is the reason assigned for considering it advisable to prepare a memorial viz. that Registered Chemists have no vote at the meeting of the Pharmaceutical Society by which their views may be recorded. We have but recently pointed out* that this disability is not a grievance but voluntary; while, at the same time, it is one which affords room for suspecting indifference to the general interests of the trade.

We hope the experience now gained of the disadvantage attending it, may be the means of inducing members of the trade to avail themselves of their capability of legitimately influencing the action of the Society, rather than by spasmodic efforts of association, which cannot be altogether without a show of hostility.

We may perhaps the more reasonably urge the adoption of this course, since there is a belief that the application of compulsory regulations will yet be attempted, and, as suggested by Mr. Sandford, perhaps by those who understand the matter less than the Council of the Pharmaceutical Society.

* *Ante*, p. 771.

We are glad to see a prompt disposition to abandon contention on the subject of regulations, and have no doubt Mr. Wilkinson's letter, published in another column, will open up a discussion that will be useful in defining the form the recommendations of the Society should take. Judging from the general feeling of respect for the Society entertained by the trade at large, we believe that, with proper management, its recommendations in regard to the storing and dispensing of poisons would effect all that could be desired.

We have been requested to call the attention of members of the Pharmaceutical Society to Section I. Clause 10 of the Bye-Laws, which provides that all subscriptions shall become due on the 1st of January in each year, and that the names of Members who have not paid their subscriptions before the 1st of May shall be omitted from the Register certified by the Council at the Annual Meeting. Those who fail to conform with this rule would thereby become disqualified from taking any part in the proceedings of the Society at the approaching annual meeting.

It is sometimes amusing to observe the ignorance of people in matters which they are presumed to have thoroughly mastered. Here is a good illustration. The Austrian United Society of Apothecaries, in a petition against free trade in pharmacy, addressed to the "Reichstag," bases some of its arguments upon the state of pharmacy in those countries where no restrictions whatever are enforced. They gravely inform their Parliament that in London, among 3000 dispensing establishments, not more than twenty enjoy or deserve public confidence, and that people often pass three or four hundred druggists' shops before they come to one where they like to have their prescriptions made up. True, these enviable twenty shops are described as establishments on the most gigantic scale, each of them employing as many as thirty dispensers. This wonderful information, no doubt as new to our readers as to ourselves, reminds us of a statement made in the Prussian Chambers some seven or eight years ago by Herr von Kucke, one of the then leading statesmen of the country. In a debate on the same subject, viz. the introduction of free trade into the practice of pharmacy in Prussia, Herr von Kucke after proudly, but not less justly, dwelling on the high *status* of the German pharmacist as compared with that of his foreign brethren, went on to say that in England the vastly superior education of the German apothecary was fully recognized by the general public, and that, as a matter of fact, the shortest way for London pharmacists to gain public confidence was to place a board in their windows with the inscription, "Deutsche Apotheke"—German pharmacy. It may be interesting to notice that in the course of this debate, it was argued against free trade that the value of the existing pharmaceutical establishments in Prussia represented a capital of 72,000,000 thalers, about £11,000,000, which the State would be bound to pay to the owners before the introduction of free trade.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

April 5th, 1871.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

MR. HASELDEN, VICE-PRESIDENT.

Present—Messrs. Abraham, Atherton, Bottle, Bourdas, Brown, Carr, Deane, Dymond, Edwards, Evans, Groves, Hills, Mackay, Savage, Stoddart, Sutton, Williams, Woolley.

The minutes of the last meeting were read and confirmed.

The Secretary reported that he had received forty-five nominations for the ensuing election of Council, and that the following twenty-two had signified their willingness to accept office if elected:—

ABRAHAM, JOHN, 87, Bold Street, Liverpool.
ATHERTON, JOHN HENRY, Long Row, Nottingham.
BETTY, SAMUEL CHAPMAN, 6, Park Street, Camden Town, London.
BROWN, WILLIAM SCOTT, 113, Market Street, Manchester.
CARR, JOHN, 171, High Holborn, London.
COLLINS, JOHN RICHARD, 81, Chalk Farm Road, London.
COOPER, GEORGE, 101, Fore Street, Exeter.
DYMOND, GEORGE, 17, Bull Street, Birmingham.
FRAZER, DANIEL, 113, Buchanan Street, Glasgow.
GREENISH, THOMAS, 20, New Street, Dorset Square, London.
HASELDEN, ADOLPHUS FREDERICK, 18, Conduit Street, Regent Street, London.
HILLS, THOMAS HYDE, 338, Oxford Street, London.
MACKAY, JOHN, 119, George Street, Edinburgh.
OWEN, JOHN, 234, Upper Street, Islington, London.
SANDFORD, GEORGE WEBB, 47, Piccadilly, London.
SHAW, JOHN, 24, Great George Place, Liverpool.
SMITH, EDWARD, 8, The Strand, Torquay.
STOTT, WILLIAM, Sowerby Bridge, Yorkshire.
WADE, JOHN, 174, Warwick Street, London.
WILLIAMS, JOHN, 5, New Cavendish Street, London.
WOOLLEY, GEORGE STEPHEN, 69, Market Street, Manchester.
YARDE, GILES, 60, Lamb's Conduit Street, London.

That the following Members of the Society had been nominated for election as Auditors for the ensuing year, and had signified their willingness to accept office:—

BARRON, FREDERICK, 2, Bush Lane, London.
BOWER, WILLIAM, 96, Tottenham Court Road, London.
HODGKINSON, WILLIAM, 127, Aldersgate Street, London.
MACKAY, JOHN BRUNT, 2, Bouverie Street, London.
SQUIRE, WILLIAM, 5, Coleman Street, London.

The Reports and recommendations of the Finance Committee were received and adopted.

The Reports and recommendations of the House Committees of 2nd of March and 4th of April were received and adopted.

The Report and recommendations of the Library, Museum and Laboratory Committee were received and adopted.

Resolved—That Free Laboratory instruction be given to the Bell Scholars for the Session 1871–72.

It having been reported by Professor Redwood that Messrs. Hopkin and Williams had presented to the Society's Museum some rare and valuable specimens of Thallium and its compounds (twenty-four in number), it was unanimously

Resolved—That the best thanks of the Council be given to Messrs. Hopkin and Williams for their valuable donation.

The Report and recommendations of the Benevolent Fund Committee were received and adopted: a grant of Ten Pounds was made to a chemist and druggist residing in Sheffield.

The Report and recommendations of the Parliamentary Committee were received and adopted.

The Society's Solicitor (Mr. Flux) attended and advised the Council on several legal questions.

The Report of the Provincial Education Committee was received, and it was

Resolved—That in future the names of "Apprentices or Students" should be omitted from the *published* list in the Calendar after a period of seven years from the date of their first registration, but that their names be retained on the General Register of the Society.

Resolved—That the following Conditions and Forms of Application under which grants and loans in aid of Provincial Schools of Pharmacy are to be made be adopted and published in the Journal:—

Form of Application for Grants in Aid of Provincial Schools of Pharmacy.

Name of Association applying for Grant ____________________

(In the following divisions state the object or objects for which the grant is required, and the amount it is desired to appropriate to any or each of the following purposes)—

A For providing apparatus, specimens, diagrams, etc. Specify the articles required, and the amount of grant requested . . . ____________________

B For providing books, etc., for library. State the particulars of the number of books already in the library of the Association, the titles and prices of the books it is now desired to purchase, and the amount of grant requested . . . ____________________

C For any other object. State the purpose for which the grant is required, and the amount requested . . ____________________

As the relative claim of any town to receive aid from the Society must be indicated by the earnestness and efficiency of local effort, state here any consideration which, in the opinion of the applicants, entitles them to a grant from the Society's funds . ____________________

(Signed) *Name* ____________________

Address ____________________

Secretary of the above Association.

Three resident Members of the Pharmaceutical Society.	*Name* __________
	Address __________
	Name __________
	Address __________
	Name __________
	Address __________

Dated __________

Form of Guarantee for the Safe Custody of Grants of Materials for Class Teaching, etc.

To the Council of the Pharmaceutical Society.

We acknowledge having received the following apparatus and materials, in accordance with the printed conditions for making and receiving grants to provincial schools of pharmacy, and we hold ourselves responsible for their safe custody for a period of three years, after which time we agree to restore them to the Pharmaceutical Society's house in London, and to defray the cost of any damage that may have occurred to them, reasonable wear and tear excepted.

(Signed) Name __________

Address __________

Secretary of the __________

Three resident members of the Pharmaceutical Society.	Name __________
	Address __________
	Name __________
	Address __________
	Name __________
	Address __________

List of Articles Received and Value.

____

____

Form of Application for Temporary Loans of Apparatus, etc., from the "Loan Collection" of the Pharmaceutical Society.

Name of Association applying for the loan.	__________
Description of the apparatus which it is desired to obtain, with number on the Society's catalogue.	__________

To the Secretary of the Pharmaceutical Society, London.

We request you to supply us with the above apparatus, on loan, for a period of fourteen days, in accordance with the printed conditions specified herewith, and we agree to give the required guarantee for their safety until returned again into your keeping.

(Signed) Name __________

Address __________

Secretary of __________

Countersigned by two Members of the Association.	__________

Dated __________

Conditions for Making and Receiving Grants and Loans in Aid of Provincial Schools of Pharmacy.

1. Grants in aid of Provincial Education in Pharmacy shall be made for the purpose of supplying materials for class-teaching, such as apparatus, specimens, diagrams, chemicals, class-books, etc., and also towards the formation of libraries.

2. That applications for such grants be made in writing to the Council on forms provided for the purpose, by local Associations of Chemists and Druggists, signed by the Secretary of the Association and by three resident Members of the Pharmaceutical Society.

3. That each application shall state the kind of aid required, and, where a money grant is applied for, shall indicate the sum intended to be applied to each specific purpose.

4. That where a grant is made for the purpose of providing *materials for class-teaching*, etc. the applicants *shall guarantee* their safe custody for a period of three years. The said materials to be *the loaned property of the Pharmaceutical Society for three years*, after the expiration of which they may be resumed by it, or otherwise disposed of. The Council may, in special cases, forego this guarantee where it deems it not desirable.

5. Applications for the use of apparatus from the "*loan collection*" of the Society may be made by local Associations of Chemists and Druggists, and grants made for periods of fourteen days, in accordance with the following rules:—

> 1. A list of the apparatus which the Society is prepared to lend, or which may be hereafter added to the collection, shall be published in the Journal, and printed for circulation in a separate form. Such list may be obtained from the Secretary of the Pharmaceutical Society.
>
> 2. This apparatus shall only be lent to Associations of Chemists and Druggists, and applications for their loan must be made in writing, on forms provided for the purpose, signed by the Secretary of the local Association, describing the articles required, and directed to the Secretary of the Pharmacetical Society.
>
> 3. The Secretary of the Pharmaceutical Society shall refer any application so received to Dr. Redwood, who, with the assistance of the Curator, shall supply the same, subject to approval of the President or the Vice-President of the Society, and to the following conditions:—
>
> A. No apparatus shall be lent for a longer period than fourteen days, unless a renewed application is made for it.
>
> B. All apparatus so lent shall be at the risk of the borrowers, who shall defray the cost of any damage that may occur to it.
>
> C. Packing-cases and packing will be provided and paid for by the Pharmaceutical Society, but cost of carriage must be paid for by the borrowers.
>
> D. A list of the apparatus lent to local Associations shall be sent to the Secretary applying for it, who shall sign and return it as a receipt for the apparatus when received.

6. Applications for aid to libraries must be accompanied by particulars of the number of volumes already contained in such library, and the name of each book applied for and its price specified.

7. The relative claim of any town to receive aid from the Society must be indicated by the earnestness and efficiency of local effort. A complete curriculum of chemistry, practical chemistry, materia medica, pharmacy and botany, is the standard to be aimed at.

8. All applications to the Council for aid may be referred to a standing Committee appointed annually for this purpose. The recommendations of the Committee to be laid before the Council for action thereon.

Form of Receipt for Temporary Loans of Apparatus, etc. from the "Loan Collection" of the Pharmaceutical Society.

List of apparatus, etc. and number of the same in the Society's catalogue, forwarded in loan for fourteen days to____________________

No.	

To the Secretary of the Pharmaceutical Society, London.

I acknowledge having received the above apparatus, etc., and agree to return it, within fourteen days, to the Society's House in London, unless a renewed application for it and a fresh grant be made; and to be responsible for its safe custody and to defray the cost of any damage that may occur to it whilst it remains at my risk.

(Signed) Name________________

Address________________

Secretary of the____________

The following is a list of that portion of Apparatus belonging to the Society which may be lent to Provincial Associations on the foregoing conditions:—

Frictional Electricity.

Glass rod, half coated with sealing-wax.
Large electrophorus on insulating stand.
Jointed electrical discharger and curved ditto.
Large framed glass, and two smaller ones, with tinfoil figures for showing luminous electrical discharge.
Two glass tubes for discharge of electricity in vacuo.
Set of four glass columns arranged on mahogany stand to exhibit luminous discharge of electricity.
Henley's universal discharger.
Cuthbertson's balance electrometer.
Harris's unit jar without stand.
Cuthbertson's quadrant electrometer.
Sir William Snow Harris's balance electrometer.
Peal of electrical bells.
Battery of five quart Leyden jars in frame.
Five Leyden jars in box.
Electric firehouse for igniting wool saturated with spirits of wine by electric spark.
Brass cannon for igniting gases by electricity.
Electrical mortar.
Electrical flask for showing discharge in vacuo.
15-inch cylinder electrical machine.
Electrical whirl on insulating stand.
Apparatus for passing electrical spark through liquids.

Galvanic Electricity.

Grove's battery, 20 cells, complete in frames.
Set of platinum wires on frames for illustrating heating and magnetic effects of galvanic electricity.
Decomposing cell.
Daniell's apparatus for the electrical decomposition of salts.
Bunsen's apparatus for decomposing water by electricity.
Small galvanometer.
Apparatus for exhibition of electric light in vacuo and in gases, mounted on tall bronze pedestal.
De la Rue's electric light apparatus.
Small medical induction coil, made in such way as to illustrate the construction.

Magnetism.

Bar magnet, 3 feet long.
Ditto for showing magnetic dip.
Compound magnet (six bars) 1 foot long.

Electro-Magnetism and Magneto-Electricity.

Electrical globe for illustrating magnetism of the earth.
Apparatus to show rotation of electric current under influence of magnetism.
Electric conductor rotating between poles of a magnet.
Disc rotating between poles of a magnet.
Whirling-table for rotating disc of copper beneath suspended magnet and for many other purposes.
Faraday's apparatus for showing rotation of current of electricity round permanent magnet.
Faraday's apparatus for showing rotation of permanent magnet round current of electricity.
Watkins' apparatus for showing rotation of magnet under influence of electric current.
Saxton's magneto-electric machine.
Model illustrating Wheatstone's needle telegraph.

Light.

Alcohol lime-light apparatus.
Glass prism on brass stand.
Solomon's magnesium lamp with clockwork motion.
Apparatus for circular polarized light. In case.
Copper bottle for "fire-cloud."
Polarizing apparatus.
A pair of thickly-silvered copper parabolic mirrors by Watkins and Hill, with supports provided with ball and socket movements.

Crystallograph, Hydrostatics, Pneumatics, etc.

Numerous models of crystals in glass and wood.
Common goniometer.
Wollaston's reflecting goniometer.
Set of five turned iron pendulum weights from 20 lb. downwards (provided with points and screw-plugs for suspension) for the pendulum experiment illustrating the rotation of the earth.
Large revolving table for use with the above.
Large diffusion-tube and stand.
Lung glass.
Mercury shower cup.
Large Magdeburg hemispheres.
Small air-pump.
Apparatus for illustrating principles of ventilation.

A letter was read from the Glasgow Chemists and Druggists' Association, applying for a copy of the "Register," whereupon it was

Resolved—That a copy of the Register be forwarded to the Glasgow Chemists and Druggists' Association for the use of its members.

Resolved—That the Editor be requested to draw the attention of members to Section 1 Clause 10 of the Bye-Laws, reminding them that the non-payment of their annual subscription (due Jan. 1st) before the 1st of May, excludes them from the privilege of voting or taking any part in the proceedings at the ensuing election.

Proposed Poison Regulations.

Memorials and protests against their adoption were presented from Hull, Newbury, Maidstone, Bradford, Canterbury, Sheffield, and Manchester.

Pursuant to notice, it was moved by Mr. Sutton and seconded by Mr. Atherton,

That an appeal to the members of the Society for their opinion, "Yes" or "No," upon the proposed Compulsory Regulations for the Storing and Selling of Poisons be made by means of a printed form to be issued with the voting-papers for the election of Council in May, and that members be requested to return such papers to the Registrar previous to the Annual Meeting on the 17th May, and that the President, together with the Mover and Seconder of the Resolution, be requested to frame the necessary paper.

This Motion was subsequently withdrawn in favour of the following—

Moved by Dymond, seconded by Mr. Abraham,

That considering the numerous and strongly expressed objections to the compulsory character of the suggested Regulations for the keeping and dispensing of Poisons by members of the Society and others who will be affected by them, and in order to obtain the more cordial adoption of these Regulations by chemists throughout the country, it is resolved to present them to the Annual Meeting with such alterations as will divest them of a compulsory character, but accompanied by the earnest recommendation of this Council that all "Pharmaceutical Chemists" and "Chemists and Druggists" in business in Great Britain do make use of these recommended Regulations in the keeping and dispensing of Poisons enumerated under the Pharmacy Act of 1868.

On a division the following voted:—

For the Motion—

Messrs. Abraham, Atherton, Bottle, Bourdas, Brown, Carr, Deane, Dymond, Groves, Mackay, Savage, Stoddart, Sutton, Williams and Woolley.

Against—

Mr. Sandford.

Messrs. Edwards and Haselden were present, but did not vote.

The Motion was therefore carried; whereupon,

Mr. Sandford stated that as during the last few months he had continued to hold office simply that his successor might not commence with so troublesome a question on his hands as the Poison Regulations, now virtually withdrawn, and as he felt that the President should at the Annual Meeting represent the views and opinions of the Council, he deemed it his duty at once to resign the Presidency.

Resolved—That the following Committee be appointed to revise the wording of the Poison Regulations, in order to bring them within the terms of the Resolution to-day passed and to make any alteration in the wording of the third clause it may suggest.

Committee—Messrs. Carr, Deane, Dymond, Groves and Williams.

REPORTS OF THE BOARDS OF EXAMINERS.

	Candidates examined.	Candidates passed.	Candidates failed.
March 15, Major	5	1	4
,, ,, Minor	17	9	8
,, 17 Minor	17	14	3
	39	24	15

Preliminary.—5 Certificates approved.

A Committee, consisting of Messrs. Sandford, Bourdas, Carr and Williams, was appointed to confer with the Board of Examiners with respect to certain proposed alterations in their regulations.

Resolved—That Walter Scott, being duly registered as a Pharmaceutical Chemist, be granted a diploma, stamped with the seal of the Society.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be elected Members:—

Arkinstall, William .... Ludlow.
Speechly, Edward .... Vauxhall.
Swain, William Thomas ...... Boroughbridge.
White, James Walter .... Hampton.

Two members, having paid their arrears of subscription and a nominal fine of 1*s*. each, were restored to their original status in the Society.

Resolved—That the following Registered Chemists and Druggists be elected

MEMBERS OF THE SOCIETY.

Ault, John .... Eastwood.
Bell, Wm. Middlewick ...... London.
Bosley, John Lawrence ...... London.
Cowles, Charles .... Stratford.
Dodds, George F. .... Kelso.
Dodds, Nicholas .... Coldstream.
Dun, Robert Thompson ...... Glasgow.
Dunmore, John .... Birmingham.
Dunsford, Samuel .... Wigan.
Frost, Wm. Toogood .... Lee.
Hammond, Charles Thomas .. Hull.
Higgins, James .... London.
Hughes, Lancelot Steele ...... London.
Hughes, Richard .... Bangor.
Hughes, Thomas .... Llandilo.
Jones, Richard .... Chipping Sodbury.
McDonald, James .... Glasgow.
Morris, Edwin .... London.
Pettigrew, John Wesley ...... Glasgow.
Roberts, John .... London.
Vincer, Frank .... Sevenoaks.
Westwood, Robert Fleetwood. .London.

Resolved—That the following, having passed their respective Examinations, be elected "Associates in business:"—

MINOR.

Warman, William Albert .... London.

MODIFIED.

Atkinson, Leonard .... Greenwich.
Bowler, William Samuel .... Belper.
Covell, William Mann ...... London.
Dickie, James .... Glasgow.
Fleming, John .... Glasgow.
Gamble, Henry Arthur ...... London.
Greig, William .... Glasgow.
Lambert, William R. .... London.
Mundy, Alfred Octavius ...... London.
Pratt, Edward Jonathan ...... Great Yarmouth.
Smith, Joe .... Wath-upon-Dearne.
Willson, Cornelius .... Grimsby.

Resolved that the following, having passed their respective Examinations, be elected Associates:—

MINOR.

Bird, Matthew Mitchell ...... Lynn.
Bothamby, Richard Broughton. Guildford.
Churchman, James .... London.
Clarke, George Ernest .... Stowmarket.
Dowson, Joseph .... London.
Earee, Edwin Thomas .... Staines.
Farrow, Charles Henry ...... Diss.
Ground, William Davie ...... Grantham.
Guy, Frederick .... Louth.
Hetherington, Martin Luther . . Highbury.
Holmes, Nathaniel Wheatcroft. Grantham.
Jaques, William .... Beverley.
Jasper, Frederick William .... Penzance
M'Neil, James Norton .... Macclesfield.
Martin, William Thomas .... Lewes.
Peters, David .... Llandilo.
Pound, Henry William ...... London.
Read, Henry Holditch .... Peterborough.
Roberts, Joseph Elliott .... Leeds.
Thompson, George Alfred .... Tunbridge.
Wilson, John Herbert .... Lee.

MODIFIED.

Allden, John .... London.
Bennett, Joseph .... Bristol.
Clark, John .... Sheffield.
Fox, George Clement .... London.
Gibbs, William Duirs .... Winchester.
Kermath, William Ramsay .... Glasgow.
Sirett, Henry, jun. .... Buckingham.
Smith, William Henry ...... Cheltenham.
Watts, Walter .... Peterborough.

PHARMACEUTICAL MEETING.

Wednesday, April 5th, 1871.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The following donations to the library and museum were announced:—

The Half-yearly Abstract of the Medical Sciences: from the Editors (per Publishers),—The Year-Book of Pharmacy and Proceedings of the British Pharmaceutical Conference, 1870: from the Conference,—On a Localized Outbreak of Typhoid Fever in Islington during the months of July and August, 1870, traced to the use of Impure Milk, by Edward Ballard: from the Author (per Publishers),—The History and Present State of Electricity, with Original Experiments, by Joseph Priestley, LL.D., F.R.S.; a Volume containing pamphlets as follows:—1, A Series of Experiments relating to Phosphori, and the Prismatic Colours they are found to exhibit in the dark, by B. Wilson, F.R.S., etc., together with a Translation of two Memoirs from the Bologna Acts upon the same subject; 2, A Lecture on the Perpetual Motion; 3, A Continuation of New Experiments Physico-Mechanical, touching the Spring and Weight of the Air, and their Effects. The I. part. Whereto is annexed a Short Discourse of the Atmosphere of Consistent Bodies, by the Honourable Robert Boyle, F.R.S.: from Mr. Alexander Bottle,—Durham University Calendar, 1871,—London University Calendar, 1871: from the Universities,—Guy's Hospital Reports, Vol. XVI., 1870–71: from the Editors (per Publishers),—On the Claims of Science to Public Recognition and Support, with Special Reference to the so-called "Social Sciences:" from W. A. Guy, M.B., F.R.S., etc. (the Author),—Zeitschrift des allgemeinen österreichischen Apotheker-Vereines, several numbers,—List of the Fellows, etc., of the Royal College of Physicians: from the College,—The Chemists and Druggists' Compendium, a Handbook of Practical Receipts and Processes: from R. J. Owen, St. Mary, Charterhouse,—Reports on the Progress of Practical and Scientific Medicine in Different Parts of the World, 1870, Vol. II.: from Dr. Dobell,—Curiosités de l'Alimentation: from Dr. J. Léon Soubeiran,—Introductory Address delivered at the opening of the Session, 1870–71 (Queen's Hospital, Birmingham): from Alexander Fleming, M.D.,—25 beautifully-prepared Specimens of Thallium and its Salts, viz., Thallium (metallic in hydrogen) acetate, antimoniate, sulpho-antimoniate, benzoate, bromide, carbonate, chlorate, chloride, sesquichloride, platinochloride, carbazotate, chromate, bichromate, iodide, molybdate, nitrate, oxalate, peroxide, silicate, sulphate, bitartrate, thallio-carb., tungstate; thallium alum: presented by Messrs. Hopkins and Williams,—Specimen of Coumarin: prepared and presented by Mr. Fredk. Janson Hanbury,—Two Specimens of Penguin Oil: presented by Mr. P. L. Simmonds,—Sugar of Ergot: presented by Mr. Rimmington (Bradford),—Specimens of Maple Sugar, Beetroot Sugar, Crystallized Cane Sugar, a fine crystal of Sucrose from Beet Sugar and Glucose from Starch as imported: presented by Mr. Stoddart.

The CHAIRMAN drew attention to several samples of poisonous articles which had been laid on the table by Mr. Bland, none of which bore any label intimating the poisonous nature of the contents, saying he apprehended Mr. Bland's object was not to anticipate any discussion on the subject of storing poisons, but rather to show the facility with which very dangerous articles might be obtained notwithstanding the clauses in the Pharmacy Act. It certainly seemed a great grievance that whilst pharmaceutical chemists were placed under numerous and heavy restrictions as to the manner in which they should carry on their business, traders of an inferior class were allowed to sell oxalic acid, acetate of lead, sulphate of zinc, cyanide of potassium and such-like articles without any protection whatever. There could be no doubt that such a mode of selling these articles was illegal, but he supposed there was no means of knowing whether the person who supplied the articles was connected with the Society or not.

Mr. BLAND said he could trace every article; they had all been supplied by totally unqualified persons.

The CHAIRMAN said in that case it was clearly a matter for the interference of the police.

Professor ATTFIELD then read a paper on "The Chemical Nomenclature of the Pharmacopœia, with Suggestions for its Revision," which will be found printed at pp. 801 and 822.

The CHAIRMAN said there was one remark in the paper which he considered of primary importance, viz. there should in all cases be a perfect understanding and unanimity in nomenclature between prescribers and dispensers, and if any system could be introduced which would increase that understanding, it would be an immense advantage to all parties. Another point of detail of considerable importance was the recommendation that different but analogous names should be distinguished by the prefix rather than the termination, on account of the inveterate habit amongst medical men of abbreviating pharmaceutical Latin. They could not very well cut off the beginning of a word, and it would be a great relief to dispensers if they could see by the first syllable what article was intended. Great difficulties had sometimes arisen in this matter, even with regard to calomel.

Professor FRANKLAND said there seemed to have sprung up two systems of chemical nomenclature, which had in many cases two distinct objects. The scientific chemist, in pursuing his investigations, was led to modify his nomenclature, and frequently also his notation; whilst, on the other hand, the pharmaceutist had to maintain as strictly as possible a uniform and intelligible system, for he quite agreed that nothing could be more mischievous than frequent or unnecessary changes of names in pharmacy. It was peculiarly fortunate, therefore, that Professor Attfield's scheme retained most of the old names, and only introduced changes where they had become almost indispensable. In the first place, there could be no doubt that the name ought to individualize the substance named; and he might be pardoned for pointing out one or two cases in the list where this rule was hardly complied with. In the case of sulphate of iron there were two substances which claimed that designation, the ferrous and the ferric sulphates, or the protosulphate and the persulphate. There might perhaps be a difficulty in the way of finding euphonious names for these two salts, but he would suggest the terms ferrosum and ferricum, instead of the word iron. There was also another point to be kept in view, viz. that, as far as possible, the nomenclature of applied chemistry should be consistent with that of chemistry exclusively scientific; and there were some instances where this consistency was somewhat departed from. At the head of the list was placed acetate of ammonium, and a little lower down acetate of morphia. Now, in two compounds so analogous, consistency required that you should be able to substitute one basic constituent for the other without altering your conception of the chemical composition; in other words, morphia ought strictly to represent ammonium, which it did not, seeing that it was the analogue of ammonia and not of ammonium. He would suggest, therefore, that the word morphium should be introduced, which he thought would lend itself as well as morphia to prescribers, especially as they would be sure to omit the termination in either case. But this would render the names of the compounds of these acids with natural alkaloids consistent with the names of the salts of the metallic elements and compound radicals such as ammonium. With regard to the naming of these alkaloids, he observed that Professor Attfield had adopted the system which was probably more in use amongst medical men than the opposite plan, to a great extent used by pure chemists, viz. the termination *ia* instead of *ine*. He did not know that any important objection could be urged against these names; and if the terminal *ia* be changed to *ium* in naming salts, it would entirely get rid of the difficulty with regard to that portion of the name representing a metallic element, or similarly constituted compound radical, which performed precisely the same functions in the different compounds. These appeared to him the only cases of inconsistency, and he was very glad to see that so slight an amount of alteration brought the system of pharmaceutical names so nearly into harmony with that of purely scientific chemistry.

Professor Redwood said that whenever the Pharmacopœia had been submitted to revision there had always been, more or less, alterations effected in the names of the substances described, and these changes had generally, although not always, been made with the view of assimilating them to those employed by scientific men. This had been the case in the last edition; the other object, and perhaps the more important, being to make each name more specific, and less liable to misconception. As such changes had been made on former occasions, so he had no doubt that whenever a new edition came out, the same thing would take place, and perhaps to a still greater extent, the foundation having been already laid by the introduction of the new notation, although it was not thought expedient then, on account of the unsettled state of the subject, to relinquish the old notation which was best understood. The old notation being retained, the old names were necessarily retained likewise, though the introduction of the new notation paved the way for such a change of names on a future occasion, as Professor Attfield had indicated. As to the time, however, when a new Pharmacopœia would be prepared it was impossible to say; but the average life of an edition having been about ten years, it would probably be some considerable time yet before another was brought out. He was not quite sure, therefore, that it was advisable to discuss the matter so long beforehand, though, were a new edition in course of preparation, he should advocate in the majority of cases precisely the changes proposed by Professor Attfield, being a change from the representation of salts of alkalies and alkaline metals to a representation of their being salts of the metals themselves, thus bringing about a consistency and uniformity in this part of the nomenclature with the other part which hitherto had not existed either in pharmacy or amongst scientific men themselves. This system had been adopted in labelling the specimens in their museum for some time; as there were two notations given in the Pharmacopœia, there was an old name which corresponded with the old notation, and a new name precisely the same as those which Professor Attfield proposed. If nothing more than this were suggested, he should have no doubt of the principle being adopted, and should himself go with the author of the paper entirely, and even to concur in what had been suggested by Dr. Frankland, that the alkaloids, morphia, quinia, and so on, should be changed to the better-known and more-easily expressed names, morphine, strychnine, quinine and so on. Such a change he thought could be made without any inconvenience or difficulty, for these were the names generally used in commerce. Dr. Frankland had remarked that there would still be, in some cases, a want of distinctness, instancing sulphate of iron, which, he said, represented two salts which required to be distinguished from each other. Now in the present Pharmacopœia both were ordered, and the names there used were, as he conceived, sufficiently distinct. The rule had been never to make a name longer than necessary to its being perfectly understood; therefore, the term sulphate of iron was applied to the ferrous sulphate or protosulphate, which was rather a long name, and, perhaps, a little theoretical; and the ferric sulphate was designated by the prefix *per*, without which the name could not be written, so that there could be no ambiguity. Whilst, however, he agreed with much that had fallen from Professor Attfield, and especially with the principles he had laid down, he could not concur in all his proposed changes, though the number to which he objected was but small. In the first place white arsenic was suggested in place of arsenious acid; and it was suggested that the term 'acid' should not be used to designate a body which contained no hydrogen, as such were not really acids according to modern views. If arsenious acid of pharmacy were the only body of the kind used, or likely to be used, in medicine, he did not know that there would be any great objection to the change, although he preferred the older term as being more distinctive, for the name "white arsenic" might be applied to arsenic acid as well as to other compounds of arsenic, while arsenious acid was not so liable to misconception. But there were other bodies which stood in precisely the same category, for instance, chromic acid, which was used as an escharotic; and if the term 'acid' must not be applied to arsenious acid, neither should it be applied to chromic acid. What then could it be called? Chromic anhydride would be a proper term, but he should not be prepared to import it into pharmacy. It was unsatisfactory, for even scientific chemists differed upon it, and it was uncertain how long it would maintain its position, and it would be very unwise, therefore, to introduce it into pharmacy, where, above all things, permanence was required. No one could have any doubt as to what was meant by arsenious acid or chromic acid, and, therefore, although the terms might be open to a little objection theoretically, he thought for practical purposes they were the best that could be adopted at present. Exception had been taken to the term bichromate of potash, and he only wondered that the proposed change to red chromate of potash had not been made before; but consistency would require that a like change should be made in the cases of bicarbonate of soda and bicarbonate of potash. These names, however, were, he thought, properly retained, being so well understood, although they were not quite satisfactory theoretically. Then, again, there was the term black sulphide of antimony, which it was proposed to substitute for the ordinary name, black antimony. In his opinion brevity was a very important consideration and he was quite satisfied with the old term, which had been thoroughly understood for generations both in commerce and in pharmacy. Then came the substances subnitrate of bismuth and carbonate of bismuth. Professor Attfield said both these were of analogous composition, and that if one was called subnitrate, the other ought to be called subcarbonate. Theoretically he should be disposed to agree with this view, but, practically, he thought it better to leave the names as they stood. The subnitrate was in the former Pharmacopœia called nitrate, but it was necessary to distinguish it from the crystalline salt which was acid in its reaction, and the prefix *sub* was used for that purpose. With regard to the carbonate of bismuth, although undoubtedly it was an oxycarbonate, yet, as there was no other carbonate of bismuth with which it could be confused, he should not be in favour of introducing a longer name when the short one was sufficiently explicit. The same theoretical objection would apply to carbonate of lead and carbonate of zinc, both of which were oxycarbonates, but no proposition was made to alter them. Chloride of tin, which was ordered as a reagent, was proposed to be changed to stannous chloride, but he was not prepared to adopt that as the only case in which this particular kind of nomenclature should be introduced. With the citrate of iron and ammonium, and the citrate of bismuth and ammonium, he would include the tartrates, which Professor Attfield took great objection to, proposing to substitute tartrate of iron and potassium for tartarated iron. The latter name was adopted as being shorter and more convenient to use than the full name, and thus the terms tartarated antimony and tartarated iron arose. They were not given as scientific names, but nevertheless they did indicate the composition, because both were tartarated products. Just as chlorinated lime was lime treated with chlorine, so the iron and antimony were treated with tartar. However, he should not object to the names tartarated iron, etc. being changed, but not for those suggested. He should prefer going back to the old names, which were familiar to all, and sufficiently explicit and euphonious, viz. ammonio-citrate of iron—potassio-tartrate of iron, which names were still used in commerce. As for the termination in *um*, which made the name so much more of a mouthful, he was quite sure that neither commercial men nor pharmacists would ever use it. Potassio-tartrate of antimony again was the old name for emetic tartar; and the new preparation called citrate of bismuth and ammonium might, in like manner, be called ammonio-citrate of bismuth. Citrate of iron and quinia, or quinine, as it was commonly called, would then require to be altered for the sake of uniformity. He did not like ammonio-quiniate of iron, and should therefore suggest ferro-citrate of quinia or quinine. There was only one other case he wished to refer to, and that was where it was suggested that the familiar name hydrated peroxide of iron should be changed to peroxydrate of iron. He was not at all favourable to such a change, thinking the old names far preferable.

Professor Odling said Professor Attfield had produced a very useful paper, and upon the whole had steered tolerably clear of difficulties. He was happy to find that in most instances where he should venture to differ from the conclusions arrived at, he had been forestalled by his friend Dr. Redwood; but at the same time he could not agree with all the remarks of the latter. With regard to the propriety of discussing such a subject at the present time, and to the probability of a new edition of the Pharmacopœia being speedily issued, he thought such discussions as the present were always useful, as they opened the way for the time when action became necessary, however long it might be deferred; and looking to the great merits and completeness of the present edition, he had no doubt that a long time would elapse before another was called for. He had been somewhat surprised at the delicacy which Dr. Redwood felt about introducing the term "white arsenic," but he was quite satisfied shortly afterwards on hearing his remark on "black antimony." Professor Attfield, he thought, had shown great discretion, both in the new names he had proposed and in regard to the old ones which he thought should be discontinued. He quite agreed that names involving the use of abbreviated Latin or Greek numerals were to be avoided as far as possible, if not altogether, and the use, where necessary, as distinctions of red and yellow, where such-like definitions obviously applied, was much to be recommended, as, for instance, green iodide and red iodide, red prussiate and yellow prussiate, yellow chromate and red chromate; for these names had at any rate the element of stability, as there was no reason to suppose that the various salts would alter their colour within the next generation or two. He also concurred in what had been said as to the use of the word 'acid.' It was well known that this term had been applied for a long series of years to two distinct classes of compounds,—those which were ordinarily bought and sold under that name, such as oxalic, citric or tartaric acids, and also to the substances which were considered to exist within these bodies, and to give them their characteristic properties. Now it was obvious that the same name should not be given to two totally distinct substances or even be applied to bodies belonging to different classes. If it were the case, which he believed it was, that the body called "white arsenic" belonged to an entirely different class of bodies from those to which the word 'acid' was now almost universally restricted by chemists all over Europe and in America, it was a pity that it should not be distinguished and called as was suggested, "white arsenic," rather than arsenious acid. Originally it would have been but a matter of little consequence to which class the word 'acid' should be applied, but, inasmuch as it was now applied by general consent to salts of hydrogen, it would be better to restrict it to that. Although, as Dr. Redwood had said, the term arsenious acid was perfectly definite, there being no true salt of hydrogen recognizable, and although it was not always necessary in pharmacy to give strictly accurate names, yet it was undesirable to suggest by similarity of name a similarity of character where such had no existence. The staple recommendation in Professor Attfield's paper was the substitution of the metallic names potassium, sodium, calcium, for the alkaline or earthy names, potash, soda and lime, and, on the whole, he thought this recommendation a wise one. At the same time he was not prepared to go quite so far as Professor Attfield had gone with regard to the history of that class of names, or with regard to the importance and necessity of the change. He was quite aware of the fact that in the writings of Lavoisier and his colleagues, sufficient would be found to warrant Professor Attfield's proposition, but there were also to be found there a large number of remarks of a totally different character and tendency. It would be found in reality that the habit of expressing the constituents of salts as binary compounds, did not originate until long after the Lavoisierian period; in fact, not until the days of Davy and Berzelius, when the electro-chemical theory was founded. It would be found that the Lavoisierian nomenclature could be traced, in a great measure, to De Morveau, and his older names were of a different character. His notion was not so much to define the composition of bodies as to define their chemical nature; what were now called sulphates he called "vitriols," and what we call nitrates, he called "nitres," differentiating them as iron vitriol and copper vitriol, and he might have gone on to say potash vitriol, and so on; as he did with the nitres, for he spoke of potash nitre and soda nitre. He did not imply by this that the former was a compound of nitric acid on the one hand with potash on the other, but that it was a substance of one particular kind, which was called a nitre or a vitriol or a fluor, as the case might be, and that the varieties were expressible by the words *de fer*, potash, etc. This was well seen in the older Latin names; for instance, what is now called chloride of sodium was called indifferently muriaticum nitratum or nitratum muriaticum, which did not associate the idea of the constituents, but rather endeavoured to indicate clearly the nature of the substance or class of the substance without expressing its ultimate composition. The idea of ultimate composition, although it was to be found in Lavoisier, was rather superadded by the results of the electro-chemical theory. Under these circumstances, therefore, he should not hesitate to use the term iodide of potash, meaning that the salt was the potash variety of iodide; still, on the whole, it was objectionable that one set of potash compounds should be called potash, and the word potassium used in other cases. Then, again, with regard to ammonium and ammonia; ammonia was such a many-faced substance that it was difficult to say which should preponderate. When the salts were analogous to those of potassium, and bore a mineral character, the word 'ammonium' might obviously be used; but when they were related to the class of amides on the one hand, or seemed more nearly related to alkalies on the other, he was not quite sure whether the balance of advantage was not the other way. At any rate, this was a point which should be left open, and the words ammonium and ammonia might be used indifferently. Again, in some of these longer names, he thought Professor Attfield had striven to arrive at that which he himself reprobated, viz. strict scientific accuracy where it was not required, and some of these names he did not think particularly fortunate; for instance, oxyhydrate of iron magnetic, peroxyhydrate of iron and perhydrate of iron moist. Strictly speaking, the last was not chemically accurate, inasmuch as it was not a hydrate which was a hydrate alone; the compound was partially a hydrate and partially an oxide; it did not correspond with a perchloride by substituting for each atom of chlorine an atom of hydroxyl. If accuracy were attempted it should be carried out, or the whole scheme would call for further revision. Then came the question of the salts, which it was proposed to call oxyacetate of copper and lead, oxynitrate of bismuth and oxycarbonate of bismuth. In these cases he much preferred the word *sub*, because, at any rate, it was not pretentious, and did not profess to give the exact definition of the body, while some of these names were scarcely accurate. He was not at that moment prepared to say whether oxyacetate of copper was strictly correct; but in some cases the salts were really hydroxyacetates, and if a name of that kind were introduced at all it might as well be strictly accurate. Under the circumstances, however, he should repudiate strict accuracy, and would suggest the use of the prefix *sub* where necessary for distinction. Where substances belonged to two different classes it would be sufficient to distinguish one class only; for instance, in the majority of cases it would be sufficient to say sulphate of iron and persulphate, but if it that were not sufficient there would be no difficulty in using the word protosulphate. In the case of chloride of mercury this would hardly, perhaps, suffice, and in that case the word *sub* might judiciously be used to distinguish the sub-chloride, although the word *sub* would then be used not in a strictly analogous sense to that in which it was applied to acetates and carbonates, basic salts, but would be applied in an exceptional manner to an exceptional substance, to fulfil an exceptional purpose. One other remark with reference to the modification of bodies by means of suffixes or affixes. Such terminations as mercur*ous* and mercur*ic* lent themselves very well to express the composition of bodies, much better indeed than the prefixes *per* and *proto*, but yet the argument seemed a very fair one which had been raised by Professor Attfield and the President, that for pharmaceutical purposes these names were scarcely practicable. In the two sulphates of iron, the persulphate and protosulphate, it was scarcely possible to distinguish between the sulphate element of the two by any mode of reaction whatever, and thus the part which was distinguished in name was hardly distinguishable in fact; whereas the part not distinguished in name—the iron—it was well known was in the two states known as ferrous and ferric, more dissimilar than the two metals nickel and cobalt, or even than nickel and iron. Therefore that portion was altered in name which was scarcely found to be altered in any way in its properties, while those things remained the same in name which were really most distinct. He could not therefore approve of such names for chemical purposes; but still, considering the difficulties which had been raised with regard to the practice which physicians adhered to of curtailing names, he did not see that in pharmacy any better plan could be adopted.

Dr. Quain said he had listened to both the paper and the discussion with the greatest pleasure. He had come not to take any part in the discussion, but simply in a conservative capacity, intending, if he heard any proposals for rashly changing names, which he was very happy to state he had not, humbly to protest against it, for nothing was more deprecated by physicians than to find the names of the materials with which they worked, altered, whilst the materials themselves remained the same. It might be true that "the rose would smell as sweet by any other name," but if the same drug were presented to a patient by a different name, in many cases they would not believe it had the same action. And not only so, but when scientific chemists were constantly, and of necessity he admitted, changing the names of bodies in accordance with the views they formed of their composition, it was sometimes very hard for practical physicians to keep up with them. As had been said repeatedly, names should be short, clear and expressive; and if they were so, and persons knew what was meant, whether it was, for example, black antimony, or tartarated iron, these names were just as good as if they were called by the long high-sounding titles that had been mentioned. For his own part, he should say the simpler the name the better, and if possible, whenever a new edition of the Pharmacopœia was issued, he hoped the names would be made still simpler and more expressive, always keeping in view that a minimum of change was desirable. With regard to the time when a new edition might be looked for, he hoped it would be a long time yet; and considering the great favour with which the present edition, prepared under the supervision of Dr. Redwood, had been received, he saw no reason to believe it would be soon superseded. At the same time he thought it advisable that any proposed changes of names should be brought forward and discussed early, in order that there might be less difficulty when the time for a new edition did come.

Mr. Groves said it was the common practice of prescribers to write both diluted hydrocyanic acid and diluted hydrochloric acid as *acid hydroc.*, which sometimes occasioned a difficulty. He suggested the propriety of going back to the old name prussic acid. *Acidum prussicum dilutum* was perfectly definite, and expressed no theoretical notions.

Dr. Redwood thought the great objection to that would be that it was too readily understood by patients. The same difficulty had been urged in other cases.

Mr. Groves said he believed the public were getting so wide awake that they recognized hydrocyanic acid as easily as prussic acid.

Professor Attfield, in reply to the observations which had been made, said his paper was divided into two distinct portions; five-sixths related to the alteration in the names of salts of the alkali-metals and alkaline earth-metals, and the other sixth to certain exceptional alterations, and it was peculiarly gratifying to him to find that his remarks on the nomenclature of the alkaline and earthy salts were pretty much confirmed by every speaker. Most of the exceptional alterations had been introduced with the view of starting a discussion on certain unsatisfactory names; he was quite willing to leave several of these names as they stood.

The Chairman said he could not help thinking he had seen during the last few years more or less inclination to call things by their wrong names. Certain preparations had been called by definite chemical names which did not really answer to their composition, and thus a practice had grown up which was a disgrace to pharmacists, and the alteration of which would certainly be attended with great advantage.

Oxyhydrogen Light.—The *Scientific American* states that a prism cut out of the mineral dolomite may be substituted with advantage in place of the lime cylinders now generally employed. As dolomite is an abundant rock, its application in this way may prove useful for purposes of lighting.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Tenth General Meeting of the Session was held at the Royal Institution on Thursday evening, the 30th March; the President, Mr. JOHN ABRAHAM in the chair.

Donations of periodicals to the Library were announced, and votes of thanks accorded to the donors.

Mr. S. G. HILDITCH called attention to the presence of phosphate of lime in animal charcoal. He thought the formula given in the Pharmacopœia for the manufacture of pure animal charcoal was incomplete, and suggested the necessity of testing for phosphate of lime before using it for chemical investigation. He promised to make further experiments and report at a future meeting. Mr. E. Davies, F.C.S., had made several experiments, and found it was not an easy matter to rid the animal charcoal of this impurity.

The paper for the evening, on "The Nomenclature of the Natural Sciences," by Mr. Charles Symes, Ph.D., etc., was read by Mr. ALFRED H. MASON, F.C.S., in the unavoidable absence of the author.

Mr. E. DAVIES, F.C.S., was glad to find that the science with which he was associated had merited praise from Dr. Symes for its system of nomenclature; there had not been so many difficulties to contend with as in some of the other sciences, as old names were changed before the great mass of new chemicals were introduced. He thought it would be a difficult matter to alter nomenclature, and in some cases not desirable. Take British Ferns, for instance, with their many varieties, alteration would not make their nomenclature more expressive. Mineralogists had the greatest difficulties to contend with; and it was there, where reform was most wanted, he thought it would be unwise to make changes upon individual authority.

The PRESIDENT thought some minerals might be described by their chemical composition. He could not see any objection to the nomenclature of diatoms being associated with the name of the first exhibiter of them. Speaking of chemistry, he regretted to note the changes in nomenclature which had taken place of late years; take, for instance, chlorides of mercury. Chemists differed in their nomenclature; for instance, sulphate of soda might be called sulphate of soda, sulphate of sodium or sodic sulphate.

Mr. DAVIES thought the change in chlorides of mercury was a very desirable one, as we now had definitely mercuric chloride and mercurous chloride.

The Secretary was instructed to convey a unanimous vote of thanks to Dr. Symes for his paper and the meeting closed.

MEETINGS FOR THE ENSUING WEEK.

MONDAY April 17.	*Medical Society*, at 8 P.M. *London Institution*, at 4 P.M.
TUESDAY April 18.	*Royal Institution*, at 3 P.M.—"On the Geology of Devonshire, especially of the New Red Sandstone." By W. Pengelly, F.R.S.
WEDNESDAY April 19.	*Society of Arts*, at 8 P.M.—"The Economical Construction of Workmen's Dwellings." By J. H. Stallard, M.D.
THURSDAY April 20.	*Royal Society*, at 9 P.M. *Linnean Society*, at 8 P.M. *Chemical Society*, at 8 P.M.
FRIDAY	*Royal Institution*, at 8 P.M.
SATURDAY	*Royal Botanic Society*, at 3.45 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCIES.

A Competitive Examination for two appointments as Navy Dispensers, with care of stores, will be held on the 25th April. For particulars, see p. 828.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[186.]—BAKING POWDER.—I see in your number for March 11th that "*Farina*" wishes for a good form for baking powder. The following is one I can confidently recommend, as I frequently have pastry, etc. made from it, besides which it is inexpensive.

R. Sodæ Carb. Exsicc. ℥viij
Acid. Tart. Exsicc. ℥vj
Pulv. Curcumæ ℥j
Magnes. Carb. Levis ℥ij

Mix. The soda and acid must be properly dried before mixing the other ingredients, otherwise the powder spoils by keeping. To be kept in stoppered bottles.—A. T. GIRDLER.

[193.]—LIQ. OPII SEDATIVUS.—An excellent formula for the above is given by Mr. T. B. Groves, F.C.S., in the PHARMACEUTICAL JOURNAL for January, 1869; but, as some readers may not be able to refer to it, I send an abridgment.

Opium, in coarse powder, $1\frac{1}{2}$ oz.
Prepared Chalk, $\frac{1}{4}$ oz.
Rectified Spirit, 5 oz. (f.)
Distilled Water, q. s.

Boil gently for half an hour the opium and chalk with one pint of distilled water; filter; wash up to 15 oz. and add the spirit. After a few days' repose filter again. It improves by keeping. Of course, the finer the opium the better the liquor. This is of the same strength as tr. opii, B. P.—A. P. BAKER.

CONDITION POWDER.

Take of Fenugreek, in powder, 16 parts.
Sulphur, in powder, 8 parts.
Cream Tartar,
Liquorice Root, in powder,
Nitrate of Potash, in powder, of each, 4 parts.
Black Sulphuret of Antimony, in powder, 2 parts.
Gentian Root, in powder,
Anise Seed, in powder.
Common Salt, in powder, of each, 1 part.

Mix.—*Pharmacist.*

[220.]—DISPENSING.—The following is a copy of a prescription brought to me, whilst living in Sussex, to be dispensed:—

R. Quiniæ Sulphatis ℈ij
Acid. Hydroch. Dil. ʒivss
Pot. Iodid. ʒiiss
Tinct. Iodi ʒiij
Syr. Aurant. ℥iv
Spt. Chlorof. ℥ii
Aq. ad. ℥viij. M.

Ft. Mist. cujus sumat coch. j mag. ex cyath. vinos. aquæ bis in die.—H. H. S.

The price I charged was 4*s*. 6*d*. Will any of your readers kindly inform me how they would prepare it?—G. C. ALLEN.

[221.]—SULPHATE OF LIME.—Can any commercial use be made of the sulphate of lime left after making the carbonic acid gas?—N.

[222.]—TINCT. COLOCYNTH.—*J. S.* would like to be supplied with a receipt for preparing tinct. colocynth.

[223.]—LIQUID GOLD.—Will any reader inform me how to make a liquid gold for lettering on metal?—C. J. B.

[224.]—GENERAL HAMILTON'S TOOTH POWDER (a preparation of some twenty years ago).—*X. C.* will be obliged for a recipe for the above.

Correspondence.

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

Poison Regulations.

Sir,—The decision of the Council at their last meeting "to issue the regulations simply as recommended by the Society" will give general satisfaction, and is a great relief to us all.

The most objectionable part of the proposition being thus withdrawn, we can now discuss the matter more calmly, and it is to be hoped we may produce some plan that will be acceptable to all. The chief objection now to the regulations is, that they apply to numerous articles which require no special care in keeping them, and to many which it would be almost impossible to keep under any of the proposed systems. There is no doubt that cantharides, ergot, oil of savin, tartar emetic and chloroform were not included in the schedule on account of their *poisonous* properties, but because they had been, or might be, used for improper purposes, and were put into the list of poisons simply in order to limit their accessibility to the public; and it is clearly unnecessary to apply the regulations to the keeping of them or their preparations.

Then with regard to vermin killers, red and white precipitate, oxalic acid, opium and others, which are commonly kept weighed ready for retail sale,—the very object of their being so kept ready is to prevent delay in serving customers; and no man could *really* keep these articles according to the regulation, whatever *pretences* of doing so he might adopt. Further, with regard to many of the "preparations" of opium, belladonna and others not particularly dangerous, but in frequent use as medicines, it is by no means desirable either to acquaint the public with their dangerous qualities, or to alarm timid customers unnecessarily by placarding them as poison.

I would, therefore, suggest that the regulations should only apply to the more dangerous articles, and would propose, that in the keeping of poisons the following precautions be recommended:—

1. That every box, bottle, vessel, or package in which any poison is kept, be distinctly labelled with the name of the article it contains; also, that every box, etc., containing arsenic or its salts, prussic acid, the poisonous alkaloids and their salts, metallic cyanides, oxalic acid, corrosive sublimate, white precipitate, liniments of aconite and belladonna, ess. oil of bitter almonds and laudanum, be labelled "Poison."

2. That the poisonous alkaloids and their salts, prussic acid, liniments of aconite and belladonna, be kept in dark blue bottles with red or orange-coloured labels.

3. In dispensing the prescriptions of medical practitioners, all liniments, lotions and embrocations containing poison be sent out in bottles distinguishable by touch or colour from ordinary medicine bottles, and that the labels used be red or orange.

By the foregoing plan every really dangerous article is subject to special precaution, which may be adopted, and the use of such further precautions as each person may think desirable is not prevented. The use of blue bottles and red labels is suggested for the sake of uniformity, and because they are becoming very generally adopted for dangerous articles.

Should, however, the plan now proposed be considered not sufficiently extended, the proposition of the Council may be shorn of most of its objectionable features by the following alterations:—

Proposed Recommendations as to the Keeping and Dispensing of Poisons.

1. That in the keeping of poisons each bottle, vessel, box, or package containing a poison be distinctly labelled with the name of the article, and that each bottle, etc. containing arsenic, prussic acid, the poisonous alkaloids or their salts, metallic cyanides, oxalic acid, corrosive sublimate, white precipitate, liniment of aconite and belladonna, ess. oil of bitter almonds and laudanum, be labelled "poison."

2. Also, in the keeping of poisons, that prussic acid, the poisonous alkaloids and their salts, liniments of aconite and belladonna, be kept on one or other of the following systems, viz.:—

(*a*) in a bottle tied over, capped, locked or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or

(*b*) in a bottle or vessel readily distinguishable by touch or colour from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop or dispensary; or

(*c*) in a bottle, vessel, box or package kept in a room or cupboard set apart for dangerous articles.

3. In dispensing the prescriptions of medical practitioners, all liniments, embrocations, and lotions containing poison be sent out in bottles readily distinguishable by touch or colour from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

By either of these plans the object in view, namely, that of guarding against accidents and mistakes, will be secured as far as can be done by any mechanical means; but it should never be forgotten that *reading the labels* is a far more important thing than locks and keys, safety caps and sand-paper, and that if a man neglect that first and most important duty,—reading his labels carefully,—neither poison-cupboards nor angular bottles nor corks set round with pins, nor any other mechanical contrivance will save him from the consequences of that neglect.

Cheetham Hill, April 11th, 1871. W. Wilkinson.

C. J. B.—(1.) The subscription to the Pharmaceutical Society after passing the Preliminary Examination is a voluntary one, and has no connection with the Minor Examination. Apply to the Secretary for a prospectus. (2.) The name of the informant would not be disclosed.

"*Somerset.*"—We consider any sum under £100 very moderate. No master who does his duty conscientiously can afford to devote the necessary time for a less remuneration than the amount named.

W. W.—Reasonable service only can be lawfully exacted. What is "reasonable" would be determined by the character and usages of the trade, which differ much in every town. Lay your grievances before your master, and ask him for as much consideration as circumstances will afford. If he decline to entertain your proposals, state your case to some solicitor, clergyman or medical man, with a request to act in a friendly way as arbitrator between yourself and your employer.

"*Cerium.*"—We believe such bottles may be obtained of any dealer in medical glass.

J. B. should apply at the College of Surgeons.

W. S. M.—(1.) We do know. (2.) Blaine's 'Outline of the Veterinary Art,' published by Messrs. Longmans.

"*A Student.*"—(1.) No. (2.) Because the ammonia citrate is the solvent of the oxide of iron. (3.) Saxony. (4.) The foreign metals are oxidized and separated in the slag formed.

"*Boiler*" has omitted to send his name and address.

The following journals have been received:—The 'British Medical Journal,' April 8; the 'Medical Times and Gazette,' April 8; the 'Lancet,' April 8; the 'Medical Press and Circular,' April 12; 'Nature,' April 6; the 'Chemical News,' April 7; 'Journal of the Society of Arts,' April 5; 'Gardeners' Chronicle,' April 8; the 'Grocer,' April 8; 'Produce Markets Review,' April 8; the 'English Mechanic,' April 7; the 'Practitioner' for April; the 'Canadian Pharmaceutical Journal' for March; the 'Philadelphia Medical and Surgical Reporter,' Nos. 730–732; the St. Neots Chronicle, March 25.

Communications, Letters, etc., have been received from Mr. J. E. Howard, Dr. De Vry, Mr. T. Collier, Mr. E. K. Campbell, Mr. Hustwick, Mr. T. Buck, Mr. C. Ekin, Mr. M. C. Cooke, Messrs. M'Master, Hodgson, and Co., Mr. T. Lowe, Mr. J. T. Newey, Mr. C. Eve, Mr. W. W. Stoddart, T. P. B., J. W., C. E. L. N., "A Country Member," "Moelline."

THE PARIS SCHOOL OF PHARMACY.

BY WALTER HILLS.

During a stay last year in Paris, I had an opportunity of working for three months in one of the laboratories of the School of Pharmacy in that city. It is probable that very few of those interested in pharmacy, who have visited Paris, are acquainted with the old edifice in the Quartier Latin, bearing the name "l'École Supérieure de Pharmacie." The following remarks, therefore, concerning this institution, and the kind of study carried on in it may be of interest:—The building, which is situated near the Panthéon, is unpretending—in fact, rather ugly; but I hear that it is proposed to erect a more commodious school. One-half of the botanical gardens, by which it was surrounded, has lately been taken for a new faubourg or boulevard, thus affording a proof that not even the abode of science is respected by the agents of Haussmann. There is a museum, similar to that at Bloomsbury Square, which is always open to the public, and a not very extensive library which is open every day from twelve to four o'clock; most of the volumes are kept under lock and key, thus necessitating an application to the librarian, on the part of the student, for the book required.

The full term of study being three years, there are three sets of laboratories. The first year's men occupy themselves with the manufacture of chemical and pharmaceutical preparations; the second with physics, and the third with analysis. These laboratories are only open to the regular students, viz. those who are following the whole curriculum; consequently, I, as a visitor, had some difficulty in gaining admission, but after numerous applications to the secretary, and writing to the Minister of Public Instruction, I was at last, thanks to Professor Soubeiran, allowed, on the payment of £4, to work in either of the three laboratories. I chose that of the third year, which is under the direction of M. Personne, and it being then about Easter, there remained twelve weeks' work, previous to the half-yearly examinations which commence about the third week in July, the subsequent vacation lasting till the commencement of November.

The laboratory for students in their third year is open every day (except Thursday) from twelve to four o'clock. Once a fortnight, there is a lecture by the managing director, stating the work to be pursued, and the methods employed for the following two weeks. All the necessary apparatus and chemicals are provided, but the students are arranged into groups of three or four, each group possessing one set of apparatus, which is continually changed according to the work to be done. This arrangement has a disadvantage, as in many cases two of the same group cannot occupy themselves at one time on the same analysis, and the old adage is exemplified "first come, first served." I should think there were about sixty or eighty students on the books of the third year, but I never saw more than about twenty working at the same time. I now give the heads of the work of each week.

1871, *le* 25 *Avril.*

1. Recherche de phosphor dans une matière organique.
2. Titrage de bromure de potassium.
3. Titrage de quinquina.
   (α) Quinine.
   (β) Cinchonidine, cinchonine, etc.

Le 2 *Mai.*

1. Titrage de lait.
   (α) Beurre.
   (β) Sucre.
   (γ) Caséine.
   (δ) Matières inorganiques.
   (ε) Eau.
2. Titrage de cinnabar, ou d'autres sels de mercure.

Le 9 *Mai.*

1. Titrage d'opium.
2. Dosage de matières grasses de graines oléagineuses.
3. Analyse de peintures blanches.
   (α) Céruse.
   (β) Oxyde de zinc.
   (γ) Sulfate de baryte.
4. Analyse de peintures vertes.
   (α) Arsenite de cuivre.
   (β) Sel de plomb avec bleu de prusse.
   (γ) Oxyde de chrome.
5. Essai et titrage de minium.

Le 16 *Mai.*

1. Recherche toxicologique de l'arsenic et de l'antimoine dans matières organiques.
2. Titrage de kermès.
3. Titrage de sulfate de magnésie.

Le 23 *Mai.*

1. Dosage de l'azote d'une matière organique.
2. Analyse d'un guano.
3. Essai des sirops.
4. Recherche de deux acides dans une matière alimentaire.

Le 30 *Mai.*

1. Dosage du carbon et de l'hydrogène d'une matière organique.
2. Essai des savons.
   (α) Dosage de l'eau.
   (β) Dosage de l'acide gras.
   (γ) Dosage de l'alcali.
   (δ) Essai d'un savon résineux.
3. Recherche de deux métaux dans une matière alimentaire.

Le 6 *Juin.*

1. Dosage du chlore d'une matière organique.
2. Dosage du soufre d'une matière organique.
3. Recherche toxicologique du mercure.
4. Recherche de deux métaux toxiques dans une matière alimentaire.

Le 13 *Juin.*

1. Essai des urines.
   (α) Dosage de l'urée.
   (β) Caractériser et doser l'albumine et ses variétés.
   (γ) Caractériser la glucose, et doser.
   (δ) Caractériser la bile.
   (ε) Caractériser les divers calculs vésiculaires.
2. Caractériser deux métaux toxiques dans une matière alimentaire.

Le 20 *Juin.*

1. Recherche toxicologique du cuivre dans un vin.
2. Recherche toxicologique du plomb dans un vin.
3. Recherche toxicologique de l'acide cyanydrique libre.
4. Recherche toxicologique de l'acide cyanydrique combiné.
5. Analyse qualitative d'un mélange pulvérulent.
6. Analyse qualitative d'une dissolution saline.

Le 27 *Juin.*

1. Caractériser les principaux alcalis organiques.
2. Recherche toxicologique de la morphine et de la strychnine.
3. Recherche toxicologique du chloroforme.

... qualitative d'un mélange pulvérulent.
4. Analyse qualitative d'une solution saline.

Le 4 Juillet.

1. Examen des fibres textiles (microscopique et chimique).
2. Recherche de taches de sang (microscopique et chimique).
3. Recherche d'un acide dans une matière alimentaire.
4. Analyse d'une dissolution minérale.

Le 11 Juillet.

1. Dosage de l'acide carbonique d'un carbonate.
2. Recherche toxicologique de l'opium.
3. Examen des farines.
   (α) Dosage et caractères du gluten.
   (β) Dosage et caractères de l'amidon.
4. Examen microscopique et chimique de diverses farines, pures et mélangées.
5. Recherche d'un alcaloïde dans une matière alimentaire.
6. Recherche de plusieurs métaux.

I hope on another occasion to give a few particulars of the lectures, examinations, etc., held at the School of Pharmacy.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Concluded from page 663.*)

Nat. Ord. Rhamnaceæ.

This Order is interesting to the pharmaceutist because it comprises several plants of great repute in earlier times. One of these is the Jujube-tree (*Rhamnus zizyphus*), whose plum-like fruit originated the well-known jujubes, which at first were formed from the juice, made into a proper consistence with gum and sugar, and extensively sold in Spain and Italy. Those now sold are only a very indifferent imitation. Another member of this Order claims to be the tree from which our Saviour's crown was made. Homer (Odyss. ix. 94) speaking of one genus, the *Zizyphus lotus*, says it furnished a juice so delicious, that for its enjoyment men would forsake their homes, country and friends.

Rhamnus catharticus (Linn.)

Is the only plant now retained in our Pharmacopœia, though why such an agent is continued in that work must be left to its compilers. Its use is confined to dogs and infants, whose cries have often borne testimony to its torturing effects on the intestines. Its use can certainly never be recommended except for punishment.

The Buckthorn occurs abundantly in the hedges around Bristol, and fine examples may be gathered at Hanham and Filton.

Its dark purple berries yield a large quantity of juice, which, boiled down with spices and sugar, forms the syr. rhamni of the B.P.

The pigment termed sap green is made by evaporation of the juice and treatment with lime.

The chemistry of the Buckthorn has never been satisfactorily worked out. According to M. Biswanger the juice contains rhamnin, rhamno-cathartin, colouring matter and gum. Rhamnin ($C_4H_{16}O_9$) is a yellow crystallizable substance, very soluble in boiling alcohol, but insoluble in ether and cold water, soluble in alkalies, but precipitated again by acids. Rhamno-cathartin is bitter and uncrystallizable, and remains after the rhamnin has been separated. It forms a yellowish, translucent mass, yields picric acid with nitric acid, and unlike rhamnin, is very soluble in water.

Nat. Ord. Leguminosæ.

This large and extensive group of plants, although containing the names of a great number with useful and medicinal qualities, yet, with one exception, is indigenous to foreign localities. From it we obtain our indigo, logwood, liquorice, gum arabic, tragacanth, catechu, kino, sandalwood, senna, cassia and copaiba. This Order is said to comprise from 6000 to 7000 species.

Sarothamnus scoparius (Wimmer).

This is the only Bristol representative of the *Leguminosæ* used in medicine. It is very common in many places. Both the yellow and white varieties may be gathered at Cook's Folly, St. George's, Stapleton, Hanham and Brislington. This pretty and attractive plant seems to delight in dry heaths and hilly ground.

> "It minds me of my native hills,
> Clad in the heath and fern;
> Of the green strath and flowery brae,
> Of the glen and rocky burn."

There seems to be some uncertainty to which of the chemical constituents Broom owes its well-known diuretic properties. Dr. Stenhouse attributes them to scoparin. The ashes, like those of most land plants, contain a large percentage of potassic carbonate. One pound of Broom tops will yield ninety grains of that salt.

When dec. scoparii is evaporated to one-tenth of its bulk and laid aside for twenty-four hours, it forms a kind of jelly. This gelatinous mass is thrown on a filter and well washed with cold water. The filtrate, when distilled with an excess of soda, yields a colourless oil, which collects at the bottom of the receiver. This is spartein ($C_{15}H_{26}O_2$), an oily, viscid base. It is sparingly soluble in water and possesses narcotic properties. Four grains will kill a large rabbit.

Scoparin ($C_{21}H_{22}O_{10}$), before mentioned as the probable diuretic principle, is obtained from the residue on the filter, after the separation of spartein. The residual jelly is boiled with water, slightly acidulated with hydrochloric acid, filtered, evaporated and set aside to crystallize, which it does with considerable difficulty. Yellow acicular crystals are formed, having neither taste nor smell. Sparingly soluble in cold water, but readily so in alkaline solutions.

Nat. Ord. Rosaceæ.

This extensive Order contains a great variety of plants in constant use among pharmaceutists.

Some of them are poisonous from the large quantity of hydrocyanic acid they contain; others are remarkable for delicious ethers, which render them esteemed among our choicest fruits, as Almonds, Peaches, Nectarines, Apricots and Plums. The only truly indigenous member of this family used in our materia medica is the Dog-rose.

Rosa canina (Linn.).

This well-known and ornamental plant is familiar to every observer of our hedgerows by its pink and white flowers, guarded by hooked prickles, reminding one of Clare's country maiden, who—

> "Eager scrambled the Dog-rose to get
> And woodbine flowers at every bush she met."

Both Hippocrates and Pliny speak of the κυνόροδον, or Dog-rose, so named, it is said, on account of its efficacy in curing the bite of a mad dog.

The part of the plant used in medicine is the fruit, which has for many years past been employed in making the conserve of hips, a useful ingredient in electuaries and tinctures, as well as an excipient in pill masses.

Nat. Ord. Umbelliferæ.

This extensive group comprises a vast number of plants, all differing in well-marked properties. Some are famed for their esculent qualities, as the Carrot, Parsnip, and Celery. Some afford a milky juice hardening into a strong-smelling resin, as assafœtida, ammoniacum, galbanum, and opoponax. Some are extrely poisonous, as Hemlock. Others supply essential oils, well known for their carminative properties, as Caraway, Anise, and Dill. These oils are very interesting. Many of them, although produced from distinct genera, have the same chemical characters, and form a distinct series. The oils of Anise, Fennel and Dill are examples; they consist of one-fifth of hydrocarbon isomeric with oil of turpentine ($C_{12}H_{16}$), and four-fifths of a solid crystallizable compound ($C_{16}H_{12}O$), sometimes called anise camphor. This it is which is so abundantly deposited when ol. anisi is affected by a cold atmosphere. The fruits of every genus are so singular and constant in their configuration, that the name may be readily ascertained. The fruit is composed of two carpels adhering to a central stalk. Each carpel is marked by five ridges separated by vittæ or channels. A transverse section placed under the microscope shows these vittæ filled with essential oil in a very beautiful manner.

Conium maculatum (Linn.).

This plant is familiar, in name at least, to all classical students, as being the poison used for destroying Athenian criminals. It is thus supposed to have caused the deaths of Socrates, Phocion and Theramenes. The name *Conium* is derived from the Greek κώνειον.

The Hemlock is found in damp places, such as the banks of the Avon, at Shirehampton and Hanham, at Bishport, Horfield, Stapleton, Bedminster, and Westbury-on-Trym.

Conium was called by the Romans cicuta; hence probably arises a very common confusion between the true Hemlock and the spotted Cowbane of North America (*Cicuta maculata*). The fruit of the former differs in the deeply-furrowed albumen. Hemlock is said to be poisonous to all animals except sheep.

The proper time for collecting Hemlock is just after flowering and when the fruit is beginning to form; before that time the active principle is not so fully developed.

Conium maculatum is known at once by the smooth stem and dark purple spots. All parts of the plant when bruised have the odour of mice, especially when moistened with liq. potassæ. This is evidently caused by the evolution of ammonia, and is exactly similar to the odour given off when crystallized nitrate of ammonia is melted.

The *Conium* owes its active properties to two alkaloids, conin and conhydrin.

Conin ($C_8H_{15}N$) is a volatile liquid, with ·89 sp. gr. showing an alkaline reaction with turmeric, and has a horribly repulsive smell like tobacco, but when diluted, like mice. This smell disappears when united to an acid, and a neutral salt formed. It is prepared by distillation with lime or potassic carbonate when ammonia, conin and conhydrin pass over.

Conin is very slightly soluble in water, but when dissolved in four parts of alcohol is miscible in all proportions. Its vapour is inflammable. Conin is most abundant in the seeds. Six pounds of unripe seeds or nine pounds of ripe seeds yield one ounce of conin. When the leaves are dried, all the conin volatilizes, so that they are useless as medicine. For the same reason, most samples of extract. conii are inert. A large number taken from several shops would not even give any odour of conin when treated with liq. potassæ. During the preparation of the extract, the evolution of ammonia may be plainly detected. One cwt. of the leaves yields about 4 or 5 pounds of extract.

The other alkaloid, conhydrin ($C_8H_{17}NO$), as its name denotes, is the hydrate of conin. During the preparation of the latter, conhydrin crystallizes in extremely thin, pearly and iridescent scales. When heated with three times its weight of phosphoric anhydride, it is decomposed into conin and water.

Nat. Ord. Caprifoliaceæ.

The Honeysuckle group is not now so much used as it once was by the pharmaceutist, only one being named in the Pharmacopœia.

Sambucus nigra (Linn.).

The flowers are used in the preparation of the water and ointment, to both of which they give a pleasant perfume. The Elder is very common throughout the district, both the usual ovate-leaved and the variety with the more finely divided leaves.

The flowers contain a volatile oil which is very soluble in water. The best method of obtaining it is to distil the flowers with as small a quantity of water as possible. Then saturate with chloride of sodium, shake with sulphuric ether and evaporate. The essential oil of Elder is colourless and solidifies at zero.

The berries contain malic acid, but the bark contains valerianic acid. The pith is a well-known microscopic object, and is extremely useful for polishing the glass of optical apparatus.

Elderberry juice is used for the adulteration of port wine, or for making a factitious substitute.

The presence of the juice in port wine is easily detected by the precipitate from cupric or plumbic acetate. The spectrum is also very distinct after the addition of alum. According to M. Fauré sophistication by elderberry juice in red wines may be detected by tannin and gelatine.

A little gelatine is dissolved in the wine and precipitated by the tannin; if the wine be genuine, all the colouring-matter is also thrown down, whereas that of the elder-juice is still kept in solution.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Ferri Peroxidum Humidum.—Solution of persulphate of iron is diluted with distilled water and poured with constant stirring into solution of soda. The brown precipitate which forms is collected, washed thoroughly to free it from sulphate of sodium, drained and preserved in the moist state. (See Ferri et Ammon. Cit.)

This preparation is employed as an antidote to arsenic; an insoluble ferrous arseniate together with ferrous hydrate being probably formed :—

$$2\,Fe_2\,6\,H\,O + As_2\,O_3 = Fe_3\,2\,As\,O_4 + Fe\,2\,H\,O + 5\,H_2\,O.$$

To be effective it must be freshly prepared, since ferric hydrate loses the elements of water even when preserved, as in this case, in contact with excess of water. The hydrates form a class of salts which are by most chemists regarded as compounds of the radicle $H\,O$ with the metals. Some of them are, however, so readily resolved into the corresponding oxides and water, that they may possibly be only molecular combinations. For example, ferric hydrate may be written $Fe_2(H\,O)_6$ or $Fe_2O_3, 3\,H_2O$. With the exception of the hydrates of the alkali metals, they are, as a general rule, insoluble in water. Graham, however, prepared soluble modifications of many of them, such as ferric and aluminic hydrates, by submitting solutions of the chlorides to dialysis. In the case of ferric chloride, a red transparent liquid remains on the dialyser. It is probable that this contains the real hydrate, $Fe_2\,6\,H\,O$, capable of existing only in solution, and that all the solid forms which we obtain as precipitates are in reality oxyhydrates.

Ferri Peroxidum Hydratum.

$$Fe_2\,O_2\,(H\,O)_2 \text{ or } Fe_2\,O_3,\ H_2\,O.$$

Moist hydrate of iron is dried at a temperature of 212° until it ceases to lose weight.

This seems to be one of the most stable and definite of the hydrates of iron. [§ Heated to dull redness in a test-tube, it gives off moisture.] The residue is $Fe_2\,O_3$: this test shows that it has not been dried at too high a temperature. When such is the case, the preparation ceases to be easily soluble in acids.

A brown ferric oxyhydrate is commonly sold in the shops under the name of "carbonate of iron." This is generally prepared by precipitating a solution of ferrous sulphate with carbonate of sodium, and exposing the resulting ferrous carbonate freely to the air during washing. It then absorbs oxygen and loses carbonic anhydride. It generally retains a minute quantity of unchanged ferrous carbonate, and so effervesces when treated with acids.

Ferri Phosphas.—[§Phosphate of iron, $Fe_3\,2\,P\,O_4$, partially oxidated.]

A solution of sulphate of iron is mixed with a solution of phosphate and acetate of sodium. The precipitate is collected and washed, to free it from the acetic acid and sulphate of sodium which are retained in solution. The use of the acetate of sodium and the nature of the reaction are explained under ferri arsenias, which is prepared in a manner precisely similar.

[§ A slate-blue amorphous powder insoluble in water, soluble in hydrochloric acid. The solution yields a precipitate with both the yellow and red prussiate of potash, that afforded by the latter being the more abundant (because the salt is essentially ferrous); and when treated with tartaric acid and an excess of ammonia, and subsequently with the solution of ammonio-sulphate of magnesia, lets fall a crystalline precipitate.]

This precipitate is $Mg\,N\,H_4\,P\,O_4\,6\,H_2\,O$; the arseniate gives an analogous compound of similar appearance, $Mg\,N\,H_4\,As\,O_4\,6\,H_2\,O$. [§ When the salt is digested in hydrochloric acid with a lamina of pure copper, a dark deposit does not form on the metal.] This test shows that it is not the arseniate. [§ 2 grains dissolved in hydrochloric acid continue to give a blue precipitate with red prussiate of potash until 25 cubic centimetres of the volumetric solution of bichromate of potash have been added.] This would indicate the presence of ·895 gram of ferrous phosphate in the 2 grams, or 44·75 per cent.

One molecule of red chromate will convert two molecules of ferrous into ferric phosphate. Ferric phosphate has the formula $Fe_2'''\,2\,P\,O_4$; it is not now used in medicine.

The syrup of phosphate of iron of the Pharmacopœia is a solution of ferrous phosphate in dilute phosphoric acid with sugar, but the proportion of phosphoric acid ordered is too large.

The deepening of colour to which this preparation is liable is often referred to change in the sugar, under the influence of the acid present; it generally arises, however, from the phosphate of iron, owing to having been imperfectly washed, retaining small quantities of acetic acid or an acetate. As oxygen is absorbed, ferric acetate is generated, and betrays itself by its deep brownish-red colour.

Ferri Sulphas.—Iron wire is dissolved in dilute sulphuric acid, aided by a gentle heat; and when the effervescence caused by the escape of the hydrogen ceases, the liquid is filtered and set aside to crystallize—

$$Fe + H_2\,S\,O_4 = Fe\,S\,O_4 + H_2.$$

Undiluted sulphuric acid has scarcely any action upon iron in the cold; but, when water is added, hydrogen gas is freely evolved. The same is the case with zinc.

In former Pharmacopœias the green vitriol of commerce was employed as the source of the sulphate of iron. It was ordered to be redissolved in water, a small quantity of sulphuric acid added, and the solution digested upon some iron wire. In this way the brown rusty ferric oxysulphate, which is always present, is reduced to the ferrous state by the hydrogen which the iron wire evolves from the sulphuric acid. Thus—

$$Fe_2\,(S\,O_4)_2\,O \;+\; H_2\,S\,O_4 \;+\; Fe \;=\; 3\,Fe\,S\,O_4 \;+\; H_2O.$$

The common green vitriol of commerce, being prepared from pyrites, generally contains more or less copper; this may be removed by digesting it in solution upon scraps of iron; but it is far better to prepare pure sulphate of iron for medicinal purposes by the official process.

Sulphate of iron should be in pale greenish-blue, not deep green, crystals; it should give a nearly white or light blue precipitate with yellow prussiate of potash. It should also give no precipitate with sulphuretted hydrogen, which would show its freedom from copper. A better test for copper is to dissolve some of the crystals in distilled water, and immerse in the solution a clean knife-blade; if copper is present, it will be deposited as a metallic coating upon the iron.

SULPHO-CARBOLATES.

BY T. H. HUSTWICK.

From communications to this and other journals on the preparation of some of the above salts, I have gathered that the formation of sulpho-carbolate of zinc is best accomplished by a process of decomposition or displacement. In a late number of this Journal (No. 39) is given a process for the preparation of this salt by decomposing sulpho-carbolate of lead by metallic zinc; doubtless the salt of zinc thus formed is of great purity, but is it not possible that a salt of equal purity may be obtained by direct combination, saving both time and trouble? My own experience leads me to suppose that it may. I have made considerable quantities of sulpho-carbolates, and the *modus operandi* followed by me has been, in its essentials, that recommended by Mr. C. H. Wood in this Journal (Vol. X. 2nd ser. No. 7); this process, however, gives a salt more or less coloured and less crystallized than when pure. Where one of the alkalies or alkaline earths is the base, nothing more is required than to evaporate the neutral solution so far as to produce a good crop of crystals; these are to be well drained and redissolved for a second crystallization. For the zinc salt I have saturated the diluted acid with the oxide, evaporating the solution till, when quite cold, a nearly solid mass of crystals is left in the bottom of the basin: this reddish-coloured magma is well broken up and allowed to rest a short time, when the supernatant liquor may be removed, the remainder placed in a calico cloth and strongly pressed, by which a further quantity of red mother-liquor is got rid of, leaving a cake of sulpho-carbolate nearly pure; this, when again dissolved, filtered and sufficiently evaporated, yields the salt in a state of purity far surpassing any other sample I have ever seen. As the expressed cake is so nearly pure, almost the whole of it may be recovered by further evaporation. This procedure applies equally to iron and copper. To obtain the copper-salt, the diluted acid is saturated with freshly-prepared moist carbonate of copper, producing a beautiful intensely green solution, which, no doubt will make an excellent colour for druggists' show-bottles. The crystals, when large, are a brilliant blue, and form clusters of great beauty, but difficult to obtain as single crystals; when small, they are green, probably from containing less water of crystallization.

The iron salt was obtained by the action of the acid on fine iron wire; the colour of the crude solution is a most intense violet, and, like that of copper, would doubtless make a good colour for show-bottles. The expressed cake, though almost white, when dissolved, reproduces the characteristic violet in almost its original intensity; the crystals produced from this solution are violet-green, the green predominating; before their removal from the evaporating basin, they should be carefully washed with ice-cold water by means of a syringe, in order to free them from the coloured mother-liquor which adheres with great pertinacity. A peculiarity of this salt is, that a freshly prepared solution is almost colourless, and without a trace of violet, but as it absorbs oxygen, peroxide of iron is precipitated, the violet tinge once more appears, and increases in intensity till it almost equals, in that respect, the crude solution.

These salts are all easily prepared, are very stable, and as they crystallize from pure solutions with great facility, and into regular geometric forms, they make capital show-objects. Some crystals of the calcium salt that I now have are perfect rhombs. The way in which all these solutions, during the progress of crystallization, climb up and over the sides of the basin, by the force of capillary attraction, is rather astonishing, unequalled, as far as my observation goes, by any other compound; it is rather a nuisance, but may be completely prevented by slightly greasing the inside edge of the vessel. Into the chemical part of the question it is not my purpose to go, but the remarkable changes exhibited by some, at least, of the sulpho-carbolates, under the action of high temperatures, shows there is room for further investigation. Exposed to the heat from a Bunsen's burner, the soda and potash salts exhibit all shades of colour from pale pink to intense purple; and afterwards placed on the glowing embers of a bright fire, combustion takes place in a very similar manner to the old Pharaoh's serpents, leaving an ash equally bulky and eccentric.

AN ALKALOID FROM CINCHONA BARK HITHERTO UNDESCRIBED.

BY DAVID HOWARD, F.C.S.

In experimenting upon impure crystallizations of quinine salts obtained from the mother-liquors of the manufacture of sulphate of quinine, I have occasionally been perplexed by an unusual loss in recrystallizing, which the mechanically adhering mother-liquor did not seem to account for.

A more careful examination of some of these substances shows that the cause, in some cases at least, is the presence of an alkaloid hitherto undescribed, the extreme solubility of the salts of which, both distinguishes it at once from the cinchona alkaloids already known, and renders it very difficult to separate from the uncrystallizable quinoidine.

The most convenient method of obtaining it is to purify the alkaloids contained in the mother-liquor from the recrystallization of such impure products as I have mentioned, by solution in ether, and after evaporation of the ether to dissolve with oxalic acid in as small a quantity of water as possible, and allow it to crystallize.

The oxalate thus obtained may be purified by recrystallization from water, with addition of animal charcoal, but I have never been able to free it entirely from a yellow colour.

The most satisfactory salt for analysis is the platino-chloride, which is prepared in the usual manner; it is almost insoluble in water or in cold hydrochloric acid, but soluble with difficulty in hot strong acid; it forms a crystalline powder by precipitation, and well-defined crystals by solution in acid.

The analysis shows that it is isomeric with the platino-chloride of quinine, but anhydrous, instead of containing one atom of water of crystallization, given off at 120°, as does the salt of quinine.

The ultimate analysis for which, as well as for the other combustions which I shall have to mention, I am indebted to the skill of Mr. Huxley and Mr. Gray, of the Royal College of Chemistry, gives the following results:—

	C.	H.	Pt.
Experiment I. . .	32·67	3·67	26·63
„ II. . .	32·67	3·82	26·62

Gerhardt's formula for the anhydrous platino-chloride of quinine, $C_{20}H_{24}N_2O_2$, $2HCl$, $PtCl_4$ requires

C 32·60 H 3·53 Pt 26·76

The salt taken for analysis was precipitated from a hot acid solution, and was a distinctly crystalline powder.

The composition is the same whether it be precipitated cold in a neutral solution, or crystallized from a strong acid solution, as the following results will show:—

Platino-chloride precipitated cold .	. Pt	26·50
„ crystallized . . .	.	26·62

The oxalate, as I have before mentioned, though it is the most easily crystallized of the salts of this alkaloid, is unfortunately very difficult to purify entirely, and changes so readily under the influence of air, light or heat, that I have been unable to obtain it colourless. When a dilute aqueous solution is concentrated by evaporation in a water-bath, the change of colour shows that decomposition has, to a certain extent, taken place, and on the addition of water, a brown resinoid matter separates from the solution. To find out if this was caused by impurities or was a property of the salt itself, I decomposed the platino-chloride of known purity by several processes, but in each case the resulting oxalate had the same colour and the same tendency to decompose. Even when prepared from perfectly colourless solutions of the alkaloid in ether, I have still found the oxalate of a greenish-yellow hue, even before the application of heat; in fact, I am not sure that this colour may not be inherent in the salt itself.

It is extremely soluble in water, the wet crystals melting at 100°, but much less so in cold water; insoluble in ether, but very soluble in alcohol, and to a less degree in amylic alcohol, from hot concentrated solutions in either of which menstrua it crystallizes freely on cooling. The water of crystallization is partially given off in vacuo, and entirely at 100° after previous drying; if the salt is at once heated to 100° without previous exsiccation, it is apt to fuse.

The combustion proved exceedingly difficult; the usual process with cupric oxide was found inadmissible, the oxalate assuming a dark brown colour as soon as it touched the oxide. The only practicable method is burning in oxygen gas, and even in this mode of analysis, the low temperature at which the substance partially decomposes, makes it difficult to accomplish successfully. It will be seen that the results, though agreeing very closely among themselves, differ considerably from the probable formula, showing plainly the difficulty of obtaining a pure product.

The hydration and the oxalic acid point to the formula $2(C_{20}H_{24}N_2O_2), C_2H_2O_4 + 9aq.$, the numbers obtained being:—

	C.	H.	$C_2H_2O_4$.	H_2O at 100.	H_2O in vacuo.
Theory . .	56·00	7·55	10·00	18·00	
Exp. I. . .	57·57	8·64	10·07	17·98	14·23
„ II. . .	57·42	8·74	9·98	17·98	14·09
„ III. .	57·74	9·14	10·08	17·89	14·02
„ IV. . .	57·85	8·79	10·23	17·72	13·82
„ V. . .	—	—	10·19	17·98	—

The water lost by drying in vacuo agrees very closely with 7 atoms, viz. 14·00 per cent.

The salt thus differs from oxalate of quinine by three atoms of water of crystallization, the formula of the latter being $2(C_{20}H_{24}N_2O_2), C_2H_2O_4, + 6aq$.

The properties of the other salts which I have examined are as follows:—The sulphate, tartrate, citrate, hydrochlorate, phosphate and acetate are all exceedingly soluble in water; on evaporation in vacuo they form semi-crystalline masses, impossible to obtain in a state fit for analysis.

The hydrobromate and ferrocyanide obtained by double decomposition form oily strata at the bottom of the solution, soluble in an additional quantity of water, but even on long standing they show no sign of crystallization.

The hydriodate also forms an oily stratum in strong solutions, but on standing it becomes semi-solid by the formation of crystals; weaker solutions also deposit a small quantity of flocculent crystals, but in neither case can they be separated from the mother-liquor.

The sulphocyanide, while also forming an oil when in concentrated solutions, crystallizes from a somewhat larger quantity of water in long silky needles, almost white, very soluble, and readily decomposed by heat.

The iodo-sulphate I have not as yet succeeded in forming. I much regret this, on account of the great importance of this salt in the cinchona alkaloids, and further experiments are needed, either to form it or to prove its absence.

The alkaloid itself, as obtained by precipitation from a solution of its salts by potash or soda, is a yellowish oil. I have not been able to obtain it pure in the solid state, for it will not bear heat without decomposition, and holds water too strongly to dry in vacuo. It is very soluble in alcohol, soluble to a large extent in ether, from which it separates as an oil when the ether is allowed to evaporate. It is a strong base; the salts are neutral to test-paper; a small excess of the base strongly restores the colour of reddened litmus. Ammonia precipitates its solutions but imperfectly, and, if we may judge from this it is even a stronger base than quinine.

Chlorine-water followed by ammonia, produces in solutions of its salts the green colour and precipitate of dalleiochin which distinguishes quinine and quinidine. Strong acids, even in the cold, produce a change of colour, and even when diluted with a considerable quantity of water; heat renders the action much more rapid. This coloration is strongest when nitric acid is used, an excess of which, with the aid of heat, will develope a strong yellow-green colour, even in a weak solution. In this reaction, as well as in the persistent colour of its salts, this alkaloid shows a curious resemblance to aricine.

The yellow colour renders the examination of its optical properties difficult, but, as far as has been hitherto tried, it is inactive. I have not been able to recognize fluorescence in its solutions.

Its taste is a peculiar bitter, very much less, both in intensity and permanence, than that of the other cinchona alkaloids.

I have not been able to find out whether this alkaloid is contained in all the species of cinchona, or, if not, to which it belongs, for the difficulty of the crystallization of the impure salts makes it a matter of uncertainty to obtain it.

My uncle, Mr. J. E. Howard, when investigating the leaves of the *Cinchona succirubra*, from India, found minute quantities of an alkaloid, soluble in ether, from which an alcoholic solution of oxalic acid precipitated it in a crystalline form; but the small quantities at his disposal prevented his examining it further than to show its analogy with quinine; his present conviction is that this substance is identical with the alkaloid I have been describing, and though the evidence is not yet sufficient to enable us to speak with certainty, it tends strongly to prove it. It seemed so desirable to settle this point, and to throw some light, if possible, on the order of formation, and possibly on the far more important and far more difficult question of the mode of formation of the alkaloids of the descending sap, that he has written to Mr. Broughton, and we hope shortly to receive a quantity of the leaves sufficient to enable us to investigate it.
—*Journal of the Chemical Society.*

COMPOUND SYRUP OF SQUILLS, SYRUP OF SENEKA AND SYRUP OF IPECACUANHA.

BY J. C. WHARTON.

The tendency of some officinal syrups to ferment is strikingly manifested by the three above named, and although the present formulæ for their preparation are improvements upon older ones, there are still serious difficulties in following implicitly the directions laid down in the U. S. Dispensatory. As a consequence, there are various inequalities in the resulting syrups, and, as I believe, fermentation is sometimes actually promoted by the tedious and lengthy proceedings required.

It will be sufficient to offer as an instance the compound syrup of squill. As it is not necessary to give the formula in detailed proportions, the reader is referred to the U. S. Dispensatory, where it will be seen that after a percolated tincture of three pints is obtained, the directions read: "Boil this for a few minutes, evaporate it by means of a water-bath to a pint, add six fluid ounces of boiling water and filter. Dissolve the sugar in the filtered liquid, and having heated the solution to the boiling-point, strain it while hot. Then dissolve the tartrate of antimony and potash in the solution while still hot, and add sufficient boiling water through the strainer to make it measure three pints. Lastly, mix the whole thoroughly together."

In following these directions as strictly as possible, I have almost invariably found that a large amount of albuminous or "pectin-like" matter was deposited, and in fact this is the stated design of raising the liquid to the boiling-point. Here arises the chief difficulty, in my opinion; at any rate I have found it to be a great one, for in attempting to remove this deposit by filtration, especially if a considerable quantity of liquid is prepared, the filter is soon clogged by the gummy matter, and the liquid filters very slowly. I have known filtration to cease towards the close of the operation. In such a case, the best that can be done is to provide a new filter and empty the old one into it, expressing it to avoid loss as much as possible. This is tedious and wasteful of the virtues of the drug. On one occasion I prepared a quantity of the tincture, and such was the tardiness of filtration that several days were occupied in completing it. Towards the end I noticed a few patches of a mouldy growth that had formed on the surface of the albuminous matter in the filter, and by smelling it perceived that the liquid was spoiled before the syrup was made. The failure was suggestive; and I concluded that if a few days were enough to spoil the liquid, a few hours' time might injure it, and, in fact, the germs of fermentation might begin to work as soon as the liquid was cold, since the protective agency of alcohol was gone.

Reasoning as above, I resorted to a method of filtration often used when a difficult precipitate is to be removed, namely, rubbing the muddy liquid with magnesia. In this case it acted with the double advantage of mingling its particles with the albuminous matter, thus facilitating filtration and neutralizing any free acid that might be present from incipient fermentation. The result was very satisfactory. Filtration was greatly hastened, and the syrup produced was not muddy-looking or translucent, as is generally the case, but was beautifully transparent. It was kept a year without fermenting, though almost daily in use.

I have since tried the same method of filtration with syrup of ipecacuanha and syrup of seneka, with like results.

There is a point that may seem objectionable in using magnesia or its carbonate as above, and it has been duly considered before offering these suggestions. It is this: magnesia is alkaline in its reactions, and as the active principle of seneka is considered to be acid (polygalic), it would seem that they are incompatible, but as they are both feeble in their affinities and as filtration proceeds rapidly, there is practically no objection to mixing them. There is, it is true, a very slight escape of carbonic acid when the carbonate of magnesia is rubbed with the concentrated liquid, but it may be due to a small amount of free acid of a different character, and even though a little polygalic acid should be removed by the magnesia the amount is so trivial as to be of no importance, and the objection is more than counterbalanced by the complete removal of the albuminous and pectinous deposit which generates fermentation, and would soon decompose more polygalic acid than the magnesia removes.

I therefore submit the following formulæ, adhering as closely to the U. S. Dispensatory as practicable, and would remark that the use of carbonate of magnesia is sanctioned by that authority in the case of the active principle of ipecacuanha, which the reader will see by referring to the method of preparing impure emetia, U. S. Dispensatory, under the article "Ipecacuanha:"—

Syrupus Scillæ Compositus.

Take of Squill, in moderately coarse powder,
Seneka, in moderately fine powder, each 4 troy oz.
Tartrate of Antimony and Potash, 48 grs.
Sugar (refined) in coarse powder, 42 troy oz.
Diluted Alcohol,
Water, each a sufficient quantity;
Carbonate of Magnesia, 60 grs.

Mix the squill and seneka, and having moistened the mixture with half a pint of diluted alcohol, allow it to stand for an hour. Then transfer it to a conical percolator and pour diluted alcohol upon it until three pints of tincture have passed. Boil this for a few minutes, evaporate it by means of a water-bath to a pint, add six fluid ounces of boiling water, rub the liquid with the carbonate of magnesia in a mortar until thoroughly mixed, filter, and add through the filter sufficient warm water to make the filtrate measure twenty-two fluid ounces. Dissolve the sugar in the filtered liquid, and having heated the solution to the boiling-point, strain it while hot. Then dissolve the tartrate of antimony and potash in the solution while still hot, and add sufficient boiling water through the strainer to make it measure three pints when cold. Lastly, mix the whole thoroughly together.

Syrupus Senegæ.

Take of Senega, in moderately fine powder, 4 troy oz.
Sugar (refined), in coarse powder, 15 troy oz.
Diluted Alcohol, 2 pints,
Water, a sufficient quantity,
Carbonate of Magnesia, 30 grs.

Moisten the seneka with two fluid ounces of the diluted alcohol, then transfer it to a conical percolator and gradually pour upon it the remainder of the diluted alcohol. When the tincture has ceased to pass, evaporate it by means of a water-bath, at a temperature not exceeding 160°, to half a pint. Rub it with the carbonate of magnesia in a mortar till thoroughly mixed, filter and add sufficient warm water through the filter to make the filtrate measure half a pint, and having added the sugar, mix well together, and note accurately the measure of the mixture while cold; then dissolve the sugar with the aid of a gentle heat, strain the solution while hot, add sufficient warm water through the strainer to bring the syrup, when cold, to the previously noted measurement and mix them thoroughly.

Syrupus Ipecacuanhæ.

(Modified from former editions of the U. S. Pharmacopœia.)

Take of Ipecacuanha, in fine powder, 2 troy oz.
Diluted Alcohol,
Water, each, a sufficient quantity,
Sugar (refined), in coarse powder, 29 troy oz.
Carbonate of Magnesia, 45 grs.

Moisten the ipecacuanha with one fluid ounce of the diluted alcohol, let it stand for twenty-four hours. Then transfer it to a conical percolator and gradually pour upon it diluted alcohol until one pint of tincture has passed. Evaporate this by means of a water-bath to six fluid ounces, add ten fluid ounces of warm water, and having rubbed it thoroughly with the carbonate of magnesia in a mortar, filter and add sufficient warm water through the filter to make the filtrate measure one pint; then add the sugar and dissolve it with the aid of a gentle heat, and having strained the hot syrup, add sufficient warm water through the strainer to make it measure two pints when cold.

It will be seen that the chief point of difference between the two first formulæ above given and the U. S. Pharmacopœia requirements is the filtration of the evaporated tinctures through carbonate of magnesia instead of paper only; but I would call the attention of the authors and revisers of both the Pharmacopœia and Dispensatory to the lack of explicit directions in many of the formulæ for syrups, from which I, with many others, have suffered loss and trouble. The difficulty is mainly in the want of full and accurate directions in regard to the various measurements. For example, the closing directions in the formula for compound syrup of squill read thus:—"Add sufficient boiling water through the strainer to make it (the hot syrup) measure three pints" (while hot?). In view of the tartar emetic, the design of the formula must be to make the syrup measure three pints when cold, but a fair interpretation of the directions cannot mean that. Now it is plain that three pints of hot syrup will not, upon cooling, be three pints of cold syrup, admitting that no evaporation takes place in the act; but most commonly a considerable evaporation will take place during the process, and of necessity a crystallization of sugar takes place. The fault is even worse in the formula for syrup of seneka. The directions read: "Filter, and having added the sugar, dissolve it with the aid of a gentle heat and strain the solution while hot." No account is taken of the loss of liquid in filtering, nor of evaporation in dissolving the sugar. If the directions are followed precisely in such cases, crystallization will inevitably take place, even if the amount of sugar prescribed is not a little too great, as I am of opinion it is in the two first of the syrups herein discussed. I believe that in practice twenty-nine troy ounces would be found to answer as well as thirty troy ounces, or a proportional reduction of other quantities.

It should be remarked that, in filtering through carbonate of magnesia, the first portions of liquid often pass through *cloudy*, and should be returned to the filter until the filtrate is *quite clear*. This will ensure a transparent syrup.—*Amer. Journ. Pharm.*

THE EXTEMPORANEOUS BENZOATING OF OINTMENTS.

BY CHARLES F. BOLTON.

The subject of benzoin in ointments has for some time past attracted the attention of the profession, and there is nothing in the whole range of pharmacy that gives more satisfaction than a perfect ointment, not only to the druggist who dispenses it, but also to the physician who prescribes, and the patient who uses it. There is nothing that reflects more credit on the pharmacist than an elegant and well-dispensed ointment. To accomplish this requires not only experienced manipulation, but something more; it needs that the unctuous matter should be fresh and free from the least trace of rancidity; it should not only be this way when dispensed, but, if possible, should be made in such a manner that it would remain in a perfectly sweet condition for a considerable length of time, thus affording the patient an opportunity of using the whole of the ointment in a sweet state. This can be effected in many instances by using the officinal unguentum benzoini as the base of the ointment, but often the physician directs the ointment to be prepared and benzoated extemporaneously. To benzoate the ointment by the officinal process involves time, but by the plan that I suggest it can be accomplished in a very short time without the aid of heat, thus saving a great deal of time and trouble. In many instances time is quite an important object. The formula that I have decided upon, after making several experiments, is as follows:—

℞. Benzoin. Pulv. (select.) ℥ij.
Ether. Sulphuric. ℥iv
Ol. Ricini ℥j.

Introduce the benzoin into an 8-ounce bottle, add the ether, macerate for twenty-four hours with frequent agitation, pass through a filter, to the filtrate add ol. ricini, and shake until dissolved; then transfer to a shallow vessel, in order to allow the ether to evaporate spontaneously; lastly, when the ether has entirely disappeared, place in a wide-mouthed bottle ready for use. With a view to economy I experimented with alcohol and benzine as solvents; the former of the specific gravity ·817 gave moderate satisfaction, the result being of a much darker colour, owing to the foreign matter in the benzoin being more soluble in alcohol than in ether; this I considered a serious objection, as it discoloured the ointment considerably, while that made with the ether did not, at least not more than if it were benzoated by the officinal process. The benzine experiment, however, was a complete failure, it extracting from the benzoin only a very small amount of benzoic acid, leaving entirely undissolved the resin, cinnamic acid and volatile oil. The result from the formula that I have given is of the consistency of a soft extract, one ounce of the extract fully representing an ounce of the benzoin in a state that is perfectly miscible with unctuous substances. I benzoated several ointments with this extract in the early part of last April, and allowed them the greater portion of the time to be exposed to the atmosphere, and when I examined them in the fall I could find none of them oxidized in the least, and in the case of ung. hydr. oxidi rubri the bright orange colour was perfectly preserved. I also used it in several prescriptions, and it always gave perfect satisfaction. I used it in the proportion of half drachm to the ounce of ointment: it can also be used very advantageously in preparations for the hair, it being very soluble in alcohol and perfectly miscible with ol. ricini in combination with alcohol, but insoluble in the fixed and volatile oils in a free state. It is also freely soluble in chloroform.—*American Journal of Pharmacy.*

SYRUP OF IODIDE OF POTASSIUM AND IRON (OF LAHACHE).

Take of

Iodide of potassium	308 grains.
Iodide of iron (in solution 1 to 3)	230 ,,
Orange-flower water	462 ,,
Simple syrup (concentrated) . .	33½ fluid ounces.

Dissolve the iodide of potassium in the orange-flower water, add the other solution and incorporate the syrup. Preserve it cool and free from light.—*Union Pharmaceutique.*

The Candle-berry Tree (*Aleurites triloba*) is well known in the Moluccas and the Pacific Islands on account of its valuable oil-seeds, which are strung on sticks and used as candles; the oil is also expressed and used for culinary purposes, and has been imported in small quantities into this country. In China another species of *Aleurites* (*A. cordata*), known as the Tungshu-tree, yields such an abundance of oil that it is said to be one of the largest products of the province of Szechuen. In point of quality it is inferior to that of the camellia, but it is very extensively used for lighting purposes. The natives call it tung oil.—*Gardeners' Chronicle.*

Galuncha.—Amongst East Indian medicinal plants the Galuncha (*Tinospora cordifolia*, Miers) has been considered of sufficient value to be placed in the new Indian Pharmacopœia. The roots and stems are the parts used, and their properties are tonic, antiperiodic and diuretic. They are used in cases of general debility after fevers, in rheumatic affections, etc., and are administered either in the form of tincture, infusion or extract. It is called Penawar Sampei (all-sufficient medicine) in Borneo, and is in daily use amongst the natives as well as by many Europeans. The plant is very tenacious of life, a portion of a stem hung up in a dry room for more than twelve months, without touching earth or water, having been known to throw out roots during the whole time.—*Gardeners' Chronicle.*

The Pharmaceutical Journal.

SATURDAY, APRIL 22, 1871.

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

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DEFECTS IN THE PHARMACY ACT.

IN a recent number of the Journal,* when calling the attention of our readers to the issue of the Register for 1871, we mentioned some of the difficulties attending its compilation, which greatly interfered with its correctness. At the same time, we pointed out that serious consequences might follow from an incorrect entry, caused by the omission of the person registered to give notice to the Registrar of any change of residence on his part. An additional source of error is unreported deaths.

Confirmation of our opinion as to the prevalence of this neglect is to be found in the statement made by a contemporary that no less than 1438 communications which were posted recently, addressed according to the Register, have been returned marked "gone away," "deceased," "not known," or with some other indorsement, indicating that the entry in the Register is incorrect. This is a state of things that, however much to be regretted, the Registrar is powerless to remedy, without the active co-operation of the registered chemists and druggists throughout the country, inasmuch as in many instances no communication is received by him from or respecting a registered person after his registration. To secure the correctness, and therein the value of the Register, any information concerning deaths or removals that may come under the notice of members of the trade should be communicated immediately to the Registrar; but hitherto this has rarely been done.

The authors of the Bill now before the State Legislature of Illinois, of which we have already given an abstract,† have foreseen this difficulty, and propose to meet it by a clause which provides that a registered pharmacist, upon changing his place of business, shall send a notice of it to the Board, and that once a year every pharmacist is to notify whether he still practises pharmacy at his registered place of business, in default of which, after one letter of inquiry from the Registrar, the name is to be omitted from the Register. Each notice is to be accompanied by a fee of one dollar, in return for which the Registrar will have to furnish him with a copy of the Register. This clause appears to furnish the machinery for securing a greater amount of accuracy in the Illinois Register than is at present found in our own, and probably the adoption of a similar rule would be advantageous here.

* *Ante*, p. 669. † *Ante*, p. 791.

THE PRELIMINARY EXAMINATION.

THE Report of the Board of Examiners relating to the Preliminary Examination on the 3rd inst., which is printed in another column, suggests matter for grave reflection. The fact that out of two hundred and ninety-four candidates who presented themselves for examination, no less than one hundred and twenty-nine, or forty-three per cent., failed to obtain the number of marks which would entitle them to registration as apprentices, seems to imply that either the standard of the examination was too high, or that a large proportion of the candidates were deficient in the knowledge which they might fairly have been expected to possess.

A perusal of the questions proposed,—which are likewise printed,—will, we think, sufficiently prove that the first alternative does not at all explain the result. To take them in the order in which they are printed. In the Latin section there was a choice given of five passages for translation, two only being required; while the questions that followed were of the most elementary kind.

With regard to this portion of the examination, we do not lose sight of the point raised by a correspondent in this week's Journal, that in consequence of all persons having to undergo the Preliminary Examination before proceeding to the Minor and Major, some who have passed the Modified are prohibited from seeking to pass the higher examinations. It is true that many men in the drug trade have very little time to spare for the study of the classics, and we know that there is a certain amount of sympathy felt for them in some quarters, which may possibly lead to steps being taken to meet their case. But we think this objection loses nearly, if not quite all its force, from the fact that two of the passages for translation—the number required—are actually such as they might be called upon at any time, in the ordinary course of their business, to render into English.

The questions in the other sections are not at all more difficult than a boy who has received a liberal education might be expected to answer, and that so many have failed to do so is strongly suggestive of the necessity of regulations for compulsory education; at any rate, it does very little credit to our present system.

It is worthy of notice that the largest proportion of failures occurred where an opposite result might fairly have been expected. Eleven candidates failed who were younger than sixteen years of age; ninety-three between sixteen and twenty; and the remainder beyond that age.

In the recent Report of Dr. Letheby to the Corporation of London and the Metropolitan Board of Works, on the quality of gas supplied to the Metropolis, it was stated that the gas had been found free from sulphuretted hydrogen, and that the quantity of ammonia had not exceeded the amount prescribed by the referees, viz. 5 grains per 100 cubic feet of gas. The presence of sulphur in illuminating gas would be particularly obnoxious to the pharmacist, on account of the destructive action of the sulphuric acid or sulphate of ammonia produced, and the consequent corrosion of brass fittings, etc. It is reported to have been found in very variable proportions, averaging from 11·5 grains to 36·11 grains per 100 cubic feet. In reference to this difference, we may here remark that there is reason to believe that much of it is referable to a variation in the results obtained in testing for sulphur; and only recently we have had occasion to notice that the actual result obtained in testing gas for sulphur by the method known as Letheby's is in reality very much a matter of accident, being so much influenced by the conditions under which the experiment is conducted.

We have been favoured with an opportunity of examining a Poison Cabinet, designed to promote the safe keeping and dispensing of poisons, which has been patented by Mr. Young. We propose to give a description of it in our next number.

The *Gardeners' Chronicle* states that in the centre of the great conservatory of the Royal Horticultural Society there is a plant upwards of 20 feet high, of the old *Rhododendron arboreum*, which has this year borne innumerable trusses of deep blood-red flowers, realizing all that the late Dr. Wallich ever wrote of the glorious effect produced on the northern slopes of the Himalaya, where vast tracts are entirely covered with them.

The *Athenæum* announces that the Educational Department of the International Exhibition is making progress, and is likely to prove not only attractive but useful, particularly in reference to science teaching. We understand that Professor Frankland has been requested to report on this branch, and we may therefore expect good service to be done towards the removal of our strange deficiencies in regard to science.

Favourable reports have been received concerning the cinchona cultivation in the West Indies. *Nature* informs us that in the Jamaica plantations the trees are seeding plentifully. About 40,000 seedling plants of *C. succirubra* have also been raised from Jamaica seed. Another hundred acres of land have been prepared for planting this spring, and there appears to be a probability of a still larger quantity being put under similar cultivation.

Among the lectures which have been announced for delivery at the Royal Institution are two "On Force and Energy," by Charles Brooke, F.R.S., May 9 and 16; and one "On the Gaseous and Liquid States of Matter," by Thomas Andrews, F.R.S., June 2.

The *British Medical Journal*, referring to a suggestion made in its columns,* and already quoted in this Journal, to the effect that an alcoholic solution of sulphurous acid would be a convenient vehicle for setting free sulphurous acid, as a disinfectant, says that Messrs. Herring and Co. have taken the hint then given, and have prepared such a solution. Articles of clothing, valuable instruments and delicate materials may be effectually disinfected by dropping a measured quantity of this solution on the bottom of a closed box in which they are placed. Pathological preparations may be preserved fresh. An antiseptic and wholesome atmosphere may in like manner be obtained in a bed or bed-chamber. As a parasiticide, on rag under impermeable tissue, it will be found most energetic.

At a recent meeting of the Royal Colonial Institute a paper was read on the "Appointment of a Reporter on Trade Products for the Colonies." After discussion, a committee was appointed to ask the Secretary of State for the Colonies to establish such a department, and further to suggest the formation of a Colonial Museum on a similar basis to that established at the India Office.

The Mezereon (*Daphne Mezereon*, L.) and the Spurge Laurel (*D. Laureola*, L.) are the only British representatives of the Natural Order *Thymelaceæ*; and the former, grown as it is in many of our gardens and shrubberies for its fragrant pink flowers opening at so early a period in the spring, is a very creditable example of the Order. The whole plant is acrid and powerfully irritant, and the bark has been used in medicine in this country. In some parts of France it is applied to the skin as an irritant in the form of a blister, a piece of the fresh bark being simply cut out, steeped in vinegar, and placed on the affected part. The leaves are likewise used in medicine in various parts of the Continent. *D. Laureola* has similar properties, indeed the same acrid principle pervades the whole Order. In Borneo the bark of a species of *Wikströmia*, probably *W. indica*, is used to allay toothache, a small piece being chewed with lime. It has also a wide reputation in that country for the cure of whitlow. The natives take a long strip of the fresh bark and bind it tightly round the finger above the diseased part, it soon produces a sore encircling the finger, which is supposed to prevent the spread of the inflammation and effect a speedy cure.

* See Pharmaceutical Journal, *ante*, p. 465.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

April 19*th*, 1871.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Deane, Edwards, Gale, Garle, Hanbury, Haselden and Ince.

Dr. Greenhow was also present on behalf of the Privy Council.

Twenty-three candidates presented themselves, viz. four Major and nineteen Minor; the following fourteen passed, and were declared to be duly qualified to be registered:—

MAJOR (as Pharmaceutical Chemists).

*Deane, James	Clapham.
Fowler, William Ratcliffe	Ipswich.
Bannard, Henry	London.

MINOR (as Chemists and Druggists).

*Saunders, Charles Price	Haverfordwest.
Cole, Walter Benjamin	Weymouth.
Pentney, James Chapman	Gorleston.
Smith, William John	Leicester.
Ritson, George	Sunderland.
Morgan, Richard	London.
Harradine, Henry Ground	March.
Ballard, Frank Perry	Ludlow.
Baker, Samuel	Chichester.
Pratt, Henry James	Thirsk.
Dawson, Cautley	Stockport.

The above names are arranged in order of merit.

FIRST OR PRELIMINARY EXAMINATION.

Two hundred and ninety-four Candidates presented themselves for this Examination on the 3rd April; the following One hundred and sixty-five passed, and were declared to be duly qualified to be registered as

APPRENTICES OR STUDENTS.

	Wade, Robert Brady	Shoreham.
Equal.	Cole, Walter Benjamin	Weymouth.
Equal.	Knight, Alfred George	Swansea.
	Reece, Thomas	Llandilo.
	Dowding, Alexander W. W.	Weston-super-Mare.
	Pitchford, William	Newton Abbot.
	Williams, Wm. Lloyd Owen	Llanberis.
	Smailes, Robert	Grantham.
	Kirkup, John	Liverpool.
	Jackson, Joseph John	Bridgnorth.
	Kempster, Fredk. Augustus	Clapham.
Equal.	Bamford, Henry William	London.
Equal.	Smith, Samuel	Leeds.
	Lloyd, Frederick	Clay Cross.
Equal.	Appleby, Edward Joseph	Brighton.
Equal.	Blunt, George	Upton-on-Severn.
Equal.	Fryer, Richard Green	Swansea.
Equal.	Good, George Arthur	Weston-super-Mare.
Equal.	Harris, William	Llandilo.
Equal.	Leach, Isaac	London.
Equal.	M'George, John	Belfast.
Equal.	Mager, William Kelk	Doncaster.
Equal.	Turner, Richard Vicary	Exeter.
	Roberts, Robert	Bala.
	Perry, John	Congleton.
	Walker, Joseph	Stoke-on-Trent.
Equal.	Cutter, Herbert	Bristol.
Equal.	Hensley, Robert Place	Maidstone.
Equal.	Jones, David William	Llandilo.
Equal.	Munday, John	Bridgnorth.
Equal.	Walker, Joseph	Whitby.
Equal.	Coates, Thomas	Malton.
Equal.	Frowd, Edward Francis	London.
Equal.	Young, Charles S.	Grantham.
Equal.	Ascott, Tom	Exeter.
Equal.	Farr, Joseph	Peterborough.
Equal.	Kendall, John	Truro.
Equal.	Priestley, Walter Herbert	Barnstaple.
	Kirk, John Robert	Leeds.
Equal.	Fuller, Thomas	Fallowfield.
Equal.	Tamplin, Charles Edward	Kingston-on-Thames.
Equal.	Walker, Thompson F.	York.
Equal.	Woolnough, Harry Arnold	Norwich.
	Longley, Joseph	Barnsley.
Equal.	Abington, Leonard Yates	Newcastle-u.-Lyne.
Equal.	Badcock, Daniel	Barnard Castle.
Equal.	Chadwick, Joseph Dunhill	Barnsley.
Equal.	Roberts, Joseph	Liverpool.
	Bambridge, Arthur John	Lancaster.
Equal.	Goodwin, J. Henry Gerrard	Ashton-under-Lyne.
Equal.	Margetts, Usher	Eastwood.
Equal.	Davies, Peter Hughes	Peterborough.
Equal.	Dawson, Francis Robert	Bolton.
Equal.	Donald, William	Aberdeen.
Equal.	Horsfield, Robert F. W.	London.
Equal.	Kirby, Thomas William	Liverpool.
Equal.	Laird, William Alfred	Portsmouth.
Equal.	Tuxford, James Edward	Boston.
Equal.	Wright, George	Sheffield.
Equal.	Carrol, George	Bath.
Equal.	Robbins, Alfred Farthing	Launceston.
	Pottinger, Thomas	Darford.
	Thompson, George	Derby.
	Jackson, George	Worksop.
	Simpson, Allwood	Stalybridge.
	Stamps, Frederick	West Bromwich.
Equal.	Carlton, Thomas Wokes	Hull.
Equal.	Hannath, Wm. Henry Wyatt	Worksop.
Equal.	Jones, Thomas	Merthyr Tydfil.
	Davison, John	West Hartlepool.
Equal.	Chesterton, William Peter	Walsall.
Equal.	David, Albert	Neyland.
Equal.	Ferriday, William	Ardwick.
Equal.	Gibson, John Chambers	Manchester.
Equal.	Kennett, James	Eastbourne.
Equal.	Marin, Ferdinand Baptist	London.
Equal.	Moore, George Brass	Barnard Castle.
Equal.	Pomeroy, Francis Thomas	South Petherton.
Equal.	Wardley, Oliver Edward	Mildenhall.
Equal.	Woollerton, Edwin Goodburn	Melton Mowbray.
Equal.	Judson, Charles Thomas	Leeds.
Equal.	Nash, William	Aberdeen.
Equal.	Ballard, John Smyth	Carmarthen.
Equal.	Humphreys, John	Ashton-under-Lyne.
Equal.	Hutchinson, George	South Shields.
Equal.	Mitchell, Thomas Maxwell	Leeds.
Equal.	Branson, Frederick Woodward	Northampton.
Equal.	Parrott, John	Norwood.
Equal.	Sell, William Henry	Bath.
Equal.	Canner, William	Derby.
Equal.	Cook, Frank	Herne Hill.
Equal.	Monkman, James Dixon	Leicester.
Equal.	Rhodes, Samuel	Oldham.
	Beverley, George	Aberdeen.
	Williamson, William	Altrincham.
	Symons, William Henry	Barnstaple.
	Michie, Henry Esson	Aberdeen.
Equal.	Jones, George Marsh	Sheffield.
Equal.	Wellington, Frederick	South Petherton.
	Davidson, Louis	Newcastle-on-Tyne.
Equal.	Bathe, Frederick James	Chippenham.
Equal.	Chubb, Richard	Launceston.
Equal.	Morley, Thomas Walter	Derby.
Equal.	Batchelor, Alfred Ernest	Fareham.
Equal.	Forster, Francis Alexander	Norwich.
Equal.	Haley, William Henry	Norwich.
Equal.	Jenkins, Henry	Salisbury.
Equal.	Jones, William	Bagillt.

* Passed with Honours.

	Brumwell, William Preston	Newcastle-on-Tyne.
Equal.	Milton, Thomas Clement	Exeter.
	Shepherd, John William	Settle.
	Green, Vittery	London.
	Newton, Alfred Henry	Kenilworth.
	Winpenny, Frank Walker	Barnard Castle.
	Brown, Horace	Thrapston.
Equal.	Dolman, William	Cheltenham.
	Rutter, Thomas Dixon	Scarborough.
Equal.	Harding, Frederick William	Norwich.
	Robinson, John Edward	Boston.
	Heald, Charles	Sleaford.
Equal.	Foster, George	Andover.
	Geldart, John	Whitehaven.
	Hammond, William Henry	Northampton.
	Helmsley, Alfred	York.
	Lewis, David	Cardigan.
	Hitchcock, James	Whittington Moor.
Equal.	Robinson, Thomas Ward	Hull.
	Sangster, William	London.
Equal.	Birrell, George	London.
	Boorne, Charles James	Reading.
	Brothers, John	Ashford.
	Goodrick, John	Aldershot.
	Heald, Samuel Haldane	Wakefield.
	Hume, John William David	Stokesley.
	Pearse, William Francis	Yarmouth.
	Howell, John	Carmarthen.
Equal.	Grayson, Charles	Bawtry.
	Parkinson, Thomas Edmund	Leeds.
	Richardson, John Richard	Leeds.
	Smith, John Thomas	Donington.
Equal.	Bannerman, Charles Alexander	Belfast.
	Lea, Frederick James	Folkestone.
	Marlee, Jonas James	Birmingham.
	Murison, Alexander A. W. P.	Macduff.
	Radley, William Gibson	Newton Abbot.
	Smithard, Herbert Henry	Guernsey.
Equal.	Barnes, William James	Dover.
	Crampton, Joseph	Leeds.
	Ellis, Thomas Wokes	Hull.
	Garry, Walter Finch	Canterbury.
	Hill, Francis	Horncastle.
	Hurley, Edward William	Reading.
	Knight, Frank	Farnham.
	M'Intyre, William	Wakefield.
	Neale, Edgar	Farringdon.
	Pidd, Arthur Joseph	Hulme.
	Rowley, John	Willenhall.
	Saunders, James Edwin	Stamford.
	Taylor, Charles Edward	Lancaster.
	White, Robert	Durham.
	Allen, William	Stratford, Essex.
	Bishop, Edward James	Leicester.
	Milner, Thomas	Thirsk.
	Adams, Herbert Richard	London.
	Jones, Owen Williams	Flint.

The above names are arranged in order of merit.

The following is a list of the towns in which examinations were held, with the number of candidates annexed:—

Aberdeen	8	Bridgnorth	2
Abingdon	2	Brighton	2
Altrincham	1	Bristol	3
Andover	1	Bury St. Edmund's	1
Ashton-under-Lyne	3	Canterbury	1
Barnstaple	2	Cardigan	2
Bath	4	Carmarthen	4
Bedford	3	Carnarvon	1
Belfast	2	Cheltenham	2
Birmingham	9	Chesterfield	3
Bideford	1	Chichester	1
Bolton	2	Chippenham	1
Boston	5	Congleton	1
Bradford	1	Coventry	2

Darlington	4	Peterborough	4
Derby	6	Portsmouth	1
Doncaster	1	Preston	3
Dover	3	Reading	3
Dudley	1	Retford	2
Durham	2	Ripon	1
Exeter	3	Rochdale	1
Farnham	2	Rochester	2
Flint	2	Ruthin	1
Grantham	3	St. Austell	1
Guernsey	1	St. Ives (Cornwall)	1
Hartlepool	3	Salisbury	1
Hertford	1	Sheffield	4
Horncastle	1	Sleaford	2
Hull	5	Southampton	1
Lancaster	3	South Shields	2
Launceston	3	Stamford	1
Leeds	10	Stockport	1
Leicester	5	Stoke-on-Trent	1
Lewes	2	Sunderland	2
Lincoln	3	Swansea	5
Liverpool	5	Taunton	4
London	44	Tewkesbury	1
Maidstone	2	Thirsk	1
Manchester	12	Torquay	2
Merthyr Tydfil	3	Truro	1
Middlesborough	1	Wakefield	6
Newark	1	Walsall	2
Newcastle-un.-Lyne	1	Weston-super-Mare	2
Newcastle-on-Tyne	6	Whitby	1
Newport (Mon.)	1	Whitehaven	3
Northallerton	1	Winchester	1
Northampton	3	Wolverhampton	1
Norwich	4	Wycombe	1
Oldham	3	Yarmouth	2
Pembroke	1	York	4

The Questions for Examination were as follows:—

LATIN.

1. Translate into English two at least of the following sentences:—

   Suam innocentiam perpetuâ vitâ, felicitatem Helvetiorum bello, esse perspectam. Itaque se, quod in longiorem diem collaturus esset, repræsentaturum, et proximâ nocte de quartâ vigiliâ castra moturum, ut quam primum intelligere posset, utrum apud eos pudor atque officium aut timor valeret. Quod si prætcrea nemo sequatur, tamen se solâ decimâ legione iturum, de quâ non dubitaret, sibique eam prætoriam cohortem futuram. Huic legioni Cæsar et indulserat præcipuè, et propter virtutem confidebat maxime.

   Cognito Cæsaris adventu, Ariovistus legatos ad eum mittit, quod antea de colloquio postulasset id per se fieri licere, quoniam propius accessisset, seque id sine periculo facere posse existimare.

   Postulavit deinde eadem quæ legatis in mandatis dederat, ne aut Æduis aut eorum sociis bellum inferet, obsides redderet: si nullam partem Germanorum domum remittere posset, at ne quos amplius Rhenum transire pateretur.

   Coque per horam dimidiam, subinde agitans, et ubi liquor refrixerit adjice aquæ destillatæ quantum satis sit ut octarios sex impleat, denique cola. In vasis bene obturatis servetur.

   Misce. Fiat haustus, quintâ quâque horâ sumendus, et tempore usûs, adde singulis, si opus fuerit, ad præcavendum diarrhœam, tincturæ opii guttas tres.

2. State to which declension each of the following nouns belongs, and give the accusative:—*emplastrum, tinctura, syrupus, pulvis, manus.*

3. What is the ablative absolute? Give one or more examples.

4. Which case do the following prepositions take after them?—*circiter*, *inter*, *apud*. Illustrate by examples.
5. Explain the difference between personal and impersonal verbs. Give examples.
6. State how the nominative to a verb is found, and exemplify the same.

ARITHMETIC.

7. A boy having 100 marbles, lost 25 at play, and then won 18, after which he lost 28: how many had he left?
8. If 100 workmen finish a piece of work in 12 days, how many will finish it in 3 days?
9. If £100 in 12 months gain £7 interest, what is the interest of £571 for 6 years?
10. Multiply $\frac{3}{5}$ of $5\frac{1}{6}$ of $\frac{5}{7}$ by $3\frac{1}{8}$ of $5\frac{1}{6}$ of $17\frac{1}{8}$.
11. Divide 5·714 by 8275·

ENGLISH.

12. Of what does etymology treat?
13. How many parts of speech are there? Name them.
14. How many cases have nouns, and which two are alike?
15. Give the plural of the following nouns:—shelf, wolf, goose, scarf, staff, tooth, ally, deer, court-martial, knight-errant, index, and penny.
16. Parse the following:—Virtue ennobles the mind, but vice debases it.
17. Write from 15 to 25 lines upon *one* only of the following subjects:—
    A. The employment of time.
    B. Perseverance.
    C. Memory.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A General Meeting of this Association was held on Friday, April 14th; Mr. STODDART, President, in the chair.

After the routine business of the meeting, a lecture was delivered by W. A. TILDEN, Esq., B.Sc., Demonstrator of Chemistry in the Laboratory of the Pharmaceutical Society, upon "Heat considered as an Agent in Chemical and Pharmaceutical Operations."

At its conclusion, a cordial vote of thanks to the lecturer was carried by acclamation.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Sixth and last ordinary Monthly Meeting of the Session was held in the Memorial Hall, Albert Square, on Friday evening, April 14th; Mr. W. S. BROWN, President, in the chair. There was a large attendance of Members and Associates.

The CHAIRMAN drew attention to the 'Book of Autograph Prescriptions' on the table. These had been collected by Mr. Joseph Ince, of London, and presented to the Association by the Council of the Pharmaceutical Society. The great value of this collection would, he hoped and believed, be appreciated by the students who frequented the rooms at Mitre Chambers. Alluding to the classes which had been held during the Session at Owens College, he said the attendance had been, on the whole, satisfactory to the Professors, though considerably smaller than the promoters of the course had hoped. A summer course of lectures on botany would be given, if a sufficient number of names were sent in to Mr. Benger, the Hon. Sec. He congratulated the members on the present aspect of the Poison Regulations, which were now to be issued as recommendations only, and he hoped that, with the modifications which would be made in them, they would be applicable to most businesses, and he trusted that chemists would apply them to the best of their opportunity, so as to ensure the safety of the public.

Mr. W. BOSTOCK then moved, "That the best thanks of this Association be forwarded to the Council of the Pharmaceutical Society, and especially to Mr. Joseph Ince, for his kindness in collecting and arranging the 'Book of Autograph Prescriptions,' presented to the Association."

Mr. G. S. WOOLLEY, in seconding the vote of thanks, said that in future much greater value would be attached to the proficiency of candidates in pharmacy and practical dispensing in the Examinations of the Pharmaceutical Society, and he would strongly advise all those who were preparing for those examinations to avail themselves of the opportunity now afforded of studying a great variety of styles of prescribing.

The resolution was carried with acclamation.

Mr. J. T. SLUGG, F.R.A.S., Vice-President, then delivered a most interesting lecture on "The Stars, what they are, where they are, and why they are." Mr. Slugg's lecture was listened to throughout with the greatest attention, and at its conclusion a hearty vote of thanks was conveyed to the lecturer.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

April 6th.—Professor Frankland, F.R.S., President, in the chair.

The PRESIDENT, occupying the chair the first time since his election, returned his thanks to the Society for the honour conferred upon him, and expressed his readiness to discharge the duties of his office to the best of his abilities.

The following gentlemen were elected Fellows: F. Coles, C. E. Groves, E. W. T. Jones, L. T. MacEwan, J. L. Shuter.

The following papers were read:—"On Burnt Iron and Burnt Steel," by W. MATTIEU WILLIAMS. Iron, which has been damaged by reheating, or excessively heated and exposed after balling in the puddling furnace, is designated "burnt iron" by the workmen. It is remarkable that no amount of heat applied to the iron in the blast-furnace, or in the early stages of the puddling process, produces burnt iron. Burnt iron is brittle, its fracture is short and what is called crystalline, it has lost the fibrous character of good iron. If steel is raised to a bright red heat and suddenly cooled, it is rendered hard and brittle, but these conditions may be modified by the process of tempering; if, however, the steel be raised to a yellow or white heat, and then be suddenly cooled, it is no longer capable of being tempered by mere reheating. It is worthless for ordinary uses of steel unless it is again raised to a welding heat and rolled or hammered while hot, then allowed to cool gradually. The fracture of burnt steel presents a coarse grain and a crystalline appearance. Careful investigation, however, shows something more, viz. that the facets of the aggregated granules have a more or less conchoidal form. The name of "toads' eyes" has been given by practical men to these concavities. Mr. Williams found that a piece of burnt iron contained oxide of iron dispersed through its mass. A sample of burnt steel, however, investigated in the same manner as the iron, showed no indications of the presence of oxide. This of course was to be expected, as the carbon of the steel must more or less completely protect the metal from oxidation. That iron, when unprotected by combined carbon, should oxidize not merely on its surface, but through its whole substance, when exposed at a sufficiently high temperature, and for a sufficient length of time to the action of the atmospheric oxygen, is not difficult to conceive, since the researches of Deville, Troost and Graham have shown red-hot iron to be permeable by certain gases. In the case of steel, as Mr. Williams states, the burning is limited to the oxidation and consequent removal of the carbon which takes place even at a low red heat. The permeability of red-hot steel by oxygen and carbonic oxide enables us to understand the process of the internal oxidation of the carbon. The "toads' eyes," or conchoidal facets of the so-called crystals, Mr. Williams explains by supposing a piece of steel at the temperature most favourable to the rapidest endosmosis of oxygen and the exosmosis of carbonic oxide to be suddenly cooled, and the possible occlusion of the carbonic oxide to be arrested. The result would be a certain molecular disintegration and porosity of the steel, presenting those conchoidal spots. This view is further supported by the fact that burnt steel may be cured by reheating and hammering, or rolling at a welding heat.

"On the Formation of Sulpho-acids," by Dr. Armstrong. Occupied with an investigation into the constitution of sulphuric acid, the author turned his attention to chlorhydric sulphate, a body discovered some years ago by Professor Williamson. When that substance, SO_2HOCl, is made to react on benzol, the chief product of the reaction is sulphobenzid, sulphobenzolic chloride and sulphobenzolic acid being also formed, but in relatively very small quantity. This led Dr. Armstrong to commence a series of experiments to determine, if possible, the conditions under which the one or the other of the above reactions took place, and to arrive at a general expression for the action of chlorhydric sulphate on organic bodies. The bodies he had until now acted upon with SO_2HOCl are brombenzol, nitrobenzol, nitrophenol (both modifications, the volatile and the non-volatile), and naphthalin. The results of his experiments lead the author to conclude that the normal action, so to speak, of SO_2HOCl is to form a sulphacid, the Cl of the chloride removing H from the body acted upon and replacing it by the group SO_3H; it is only under certain conditions that both Cl and HO are removed from the chloride, and a sulphobenzid-analogous compound formed. What these conditions are, Dr. Armstrong hopes to establish by further experiments.

"On a Water from the Coal-Measures at Westville, N.S.," by Professor How. The contents of this paper bear upon the relation of the constitution of a water and the nature of the geological stratum from which it takes its origin. The water above-mentioned comes from what Dr. Dawson terms the Middle Coal Formation of Nova Scotia, which includes the productive beds of coal, and which, according to the same authority, are destitute of properly marine limestone. The analysis of the water seems to bear out the latter assertion, since the water is very poor in chlorides.

MEDICAL SOCIETY OF LONDON.

At the meeting of the Medical Society on Monday, March 13, Dr. B. W. Richardson read a paper, entitled "Some Further Additions to Therapeutics: Organic Bromides, Metachloral; with a Note on Sulphur Alcohol." After reference to the methods of research in therapeutics, he introduced some new medicinal bromides, viz. bromide of quinine, bromide of morphine, and bromide of strychnine, together with some combinations of them. He said that bromides were best administered in the form of syrups, containing one grain of the bromide of quinine, one-eighth of a grain of morphine, or one thirty-second part of a grain of bromide of strychnia in the drachm of each of the respective syrups. Compounds of the syrups of the bromides of quinine and morphine, and of quinine, morphine and strychnine were also useful. In each drachm of these the same proportion of dose was maintained. He had found the bromide of quinine of great service in syphilitic ulceration. Repeated doses of syrup of bromide of quinine and morphine in cases of neuralgia, and the syrup of quinine, morphine and strychnine, in a case of diabetes, had been signally successful. He believed the bromide of quinine to be the best preparation in cases of remittent or intermittent fever. Dr. Richardson next mentioned bromal hydrate, which he said was less soluble, and produced more convulsive action than chloral hydrate, and could not, he thought, replace it. He then exhibited a specimen of pure anhydrous chloral, which by the addition of pure water was converted into chloral hydrate. He suggested that as chloral itself was a fluid caustic, abstracting water rapidly, it might be usefully employed in some cases where soft fungous growths had to be removed. A specimen of metachloral, an insoluble white substance, obtained by the action of sulphuric acid upon chloral hydrate, was then shown. It is isomeric with chloral, and when treated with an alkali is resolved into chloroform and chlorate of the alkali employed. It seemed to act as a gentle narcotic when administered to inferior animals. Lastly, Dr. Richardson exhibited a specimen of mercaptan, or sulphur alcohol (C_2H_6S), in which the oxygen of ordinary alcohol is replaced by sulphur. He furnished considerable information concerning the action of this agent, and specially mentioned the mental depression produced by it even when taken in very minute quantities. He said also that it communicated to the breath a peculiar odour like that met with in wasting diseases, a fact which might furnish the groundwork for a new line of research in the diagnosis of disease.

SOCIETY OF ARTS.

The Cultivation of the Beet-root in England.

At the Ordinary Meeting of this Society held on Wednesday, March 8th, a paper was read by Dr. Augustus Voelcker, F.R.S., on "The Cultivation and Uses of Sugar-Beet in England." The author commenced by stating that scarcely more than half a century had passed since the first beetroot sugar manufactory was erected in Germany and sugar was extracted from beetroot on a commercial scale; yet in spite of many hindrances in the shape of vexatious fiscal regulations, and the want of experience inseparable from a new manufacture, the cultivation of the beetroot was largely extending in France, the north of Germany, Belgium, and Austria. It had also found its way into Russia, Sweden and the United States. At present there were over 500 beetroot sugar factories and distilleries in France, nearly 200 in Belgium and about 300 in Prussia. Probably the number of Continental factories did not fall far short of 2000, most of which were reported as doing a lucrative business. Notwithstanding the success which had attended the industry abroad, few attempts had been made in England to cultivate this useful crop, which he attributed to the fact that while on the Continent the manufacturer was often himself a farmer, this was not the case in England; and, therefore, the farmer in this country did not pay such special attention to the cultivation of roots rich in sugar.

In speaking of the cultivation of the beetroot, Dr. Voelcker described it as a biennial plant, growing wild in the south of Europe. It was introduced into the Netherlands by the Spaniards, and thence brought into Germany. The common field beet, of which the German name is "mangelwurzel," was introduced into this country from Germany during the last century. The sugar-beet is a variety of the common mangelwurzel obtained by crossing and culture. Of the different sorts, the white Silesian root (*Beta alba*) is the most valued as being particularly rich in sugar. When grown in perfection it is pear-shaped, white in the body, shows very little above ground, penetrates about twelve inches into the soil and has numerous radicles. It is light green on the top, has white flesh, green leaves with lighter coloured ribs, and strong long petioles. The specific gravity of the beetroot affords a good test of its quality; the greater its specific gravity the richer, as a rule, will it be found in sugar. A better test is the specific gravity of the juice, which, when of good quality, usually varies in sp. gr. from 1·07 to 1·06, or even 1·078. These roots contain over 14 per cent. of crystallizable sugar. The juice of roots poor in sugar invariably falls below sp. gr. 1·06.

After treating of the character of the soils suitable or ill-adapted for the growth of beets, the manure, the time of sowing, distance of planting and various other points connected with the cultivation, the author proceeded to discuss the composition of sugar-beets. He said that all the sugar present in fairly ripe roots is crystallizable, and when perfectly pure, identical in composition with crystallized cane-sugar. Beetroots do not contain any glucose, or grape sugar, and the glucose contained in the molasses produced in beet-sugar manufacture is the result of changes which cannot altogether be avoided in extracting the crystallizable sugar from the roots. In addition to sugar, which is the principal solid constituent of beets, there is found in them water, albuminous or nitrogenous compounds, vegetable fibre, pectinous compounds, and mineral constituents taken up from the soil.

The following is the report of an analysis of a root grown in the neighbourhood of Lavenham, in Suffolk. The root is described as having a red top, rose-coloured skin, and weighing 2 lb. 4½ oz. The specific gravity of the juice was 1·0689 at a temperature of 64° F.

Moisture	82·72
Albuminous compounds (containing ·231 of nitrogen)	1·44
Crude fibre (pulp)	3·38
Crystallizable sugar	10·94
Pectin, colouring matter, etc.	·45
Mineral matter (ash)	1·07
	100·00

Other roots grown at Lavenham, and in Norfolk, Berkshire and Buckinghamshire, contained from 9 to 11 per cent. of sugar.

As an illustration of the importance of a judicious use of manure in the cultivation of beet, Dr. Voelcker mentioned that the highest percentage of sugar, amounting to 13 per cent., which he had obtained from any of the numerous specimens that had been sent him was from a rose-coloured Silesian beet weighing little above two pounds, which had been grown at Barking with London sewage. On the other hand, in another specimen raised by the same sewage in the same season, he found only 3 per cent. of sugar. The author then described the process of the manufacture of beetroot sugar, an account of which we purpose giving in noticing another paper read before the Society at its next meeting.

Beetroot distillation was the next subject passed under review, a business which on the Continent is often added to the sugar manufacture, as it enables the manufacturer in a season when the beetroot is too poor to extract the sugar with profit, to utilize the crop by fermenting the sliced roots or their saccharine juice, and obtain by distillation the spirit which has been produced by the process of fermentation. The roots which are comparatively poor in sugar also contain a larger proportion of albuminous and saline constituents which interfere with the production of sugar-crystals, but have no influence on the fermentation, and do not diminish the amount of alcohol. In addition to water, the first distillation of the fermented roots contains certain bye-products of fermentation which are poisonous, and have a very unpleasant taste and smell. They are volatile, and popularly known under the name of fousel oils. From these volatile impurities the weak crude spirit is separated by rectification.

The paper concluded with a reference to the value of the beetroot pulp, or refuse, which is produced in the sugar manufactories or distilleries, as a feeding material. In its natural state the pulp contains from 70 to 72 per cent. of water, while in the ordinary mangold the water amounts on an average to 88 or 89 per cent. In round numbers the refuse pulp of sugar factories where presses are used contains, in 100 parts:—

Water	70·0
Sugar	1·5
Albuminous compounds (flesh-forming matters)	2·5
Crude fibre and a little lactic acid	24·0
Mineral matter (ash)	2·0
	100·0

Taking into consideration the probable difference in the feeding value of sugar and vegetable fibre, Dr. Voelcker said he was inclined to think that a ton of fresh beetroot pulp, as it comes from the presses, or old pulp, not containing more water than fresh, is worth fully as much for feeding purposes as 1½ tons of the beetroots from which it is obtained, or two tons of common mangolds.

LONDON CHEMISTS' ASSOCIATION.

At the Meeting on Thursday, March 9th, Mr. Cox occupying the chair, Mr. Jessop made some remarks on Structural Botany. He endeavoured to show in what way the structure of plants, both with regard to their internal and external organs, may best be studied.

By the help of a number of well-executed diagrams, he pointed out the differences in shape of the various kinds of cells, explaining how they became modified, and how they were all traceable back to the original oval shape. He carried out the same plan with roots and bulbs, and showed how the different forms of these may be derived from certain primary forms; several diagrams were exhibited, in which leaves were traced from a few simple lines to their many modifications of shape. The arrangement of leaves upon their stems was next spoken of. It seemed, Mr. Jessop remarked, that leaves followed some arithmetical rule of growth; it was almost the only instance in which figures were of any use in botany. The theory that the veins of leaves strike off from the primary vein at the same angle as the stems of the plants on which they grow was also gone into; there could be no doubt, he said, that similar species, and even genera, of plants followed such a law. Mr. Jessop next spoke of plants becoming modified, so as to suit themselves to certain conditions of life; of how plants grow in classes and compose the scenery of certain districts and countries. After explaining why botany was not, and could not, be a science made up of abstract laws, he said he certainly thought more might be done to simplify the study in the manner he had attempted.

After discussing some notes in the "Inquiry Box," a vote of thanks to Mr. Jessop and the Chairman terminated the meeting.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Pharmaceutical Meeting on March 21st, Mr. Boring referred to several specimens from a large natural deposit of phosphates, recently utilized by the Charleston (South Carolina) Mining and Manufacturing Company. Some of these are bones, vertebræ, etc., of large animals, but others appear of irregular and indefinite shapes, so as to obscure their origin. The quantity of this material is immense, and it is readily obtained near the surface. According to the published analysis it contains about 29 per cent, of phosphoric acid, equal to about 63 per cent. of bone phosphate of lime; its chief use at present is in the fabrication of fertilizers.

Prof. Maisch exhibited samples of *Vanilla planifolia*,—Bourbon Vanilla. This variety does not possess the same delicacy of odour as the Mexican. The bean differs from the Mexican, being shorter, wider and terminating more abruptly at the ends. Prof. Maisch also made some remarks upon several varieties of Rhubarb not met with in the United States markets. These rhubarbs are grown in Austria, and called *Rheum Emodi* and *Rheum palmatum*. They are cultivated to a considerable extent, principally for dispensing to the poor, being very much cheaper in price. A sample exhibited was handsome in appearance, and sold at \$5 to \$7.20, gold, for 108 pounds. This variety is so well prepared that it is very difficult, except upon close examination, to distinguish it from good Chinese rhubarb.

Mr. Gailard spoke of the elixir of pepsin, bismuth and strychnia, and the difficulty experienced by most apothecaries in preventing precipitation, and suggested forming a citrate of the quinia and strychnia with excess of citric acid, neutralizing the excess of acid with ammonia; by this means he obtained a satisfactory preparation.—*Amer. Journ. Pharm.*

MEETINGS FOR THE ENSUING WEEK.

Monday April 24. ......*Medical Society*, at 8 P.M.
London Institution, at 4 P.M.—"On Astronomy" (Educational Course). By R. A. Proctor, F.R.A.S.

Tuesday April 25. ......*Royal Institution*, at 3 P.M.—"On the Geology of Devonshire, especially of the New Red Sandstone." By W. Pengelly, F.R.S.
Royal Medical and Chirurgical Society, at 8.30 P.M.

Wednesday April 26. ...*Society of Arts*, at 8 P.M.—"Photography in the Printing Press, being a Description of the Working of the Heliotype Process." By E. Edwards.
London Institution, at 12.—Annual Meeting of Proprietors.

Thursday April 27. ......*Royal Society*, at 9 P.M.
London Institution, at 7.30 P.M.—"Economic Botany." By Professor Bentley.

Friday April 28. ....*Royal Institution*, at 8 P.M.
Quekett Club, at 8 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCY.

The office of Dispenser at the South Staffordshire General Hospital. For particulars, see advertisement in last week's Journal.

Parliamentary and Law Proceedings.

Poisoning of a Child through the Mistake of the Doctor.

At Counden, near Bishop Auckland, the child of a pitman has been accidentally poisoned, in consequence of the wrong powders having been given. Directly the mistake was discovered the doctor, Mr. M'Intosh, was sent for, who said it was entirely his fault, that he had sent the powders for the mother instead of the child. The child died on Sunday, March 26th. An inquest was opened by the deputy-coroner on the following Wednesday, but the inquiry was adjourned for a fortnight.—*South Durham and Cleveland Mercury.*

Poisoning by Cyanide of Potassium.

An inquest has been held at St. Neots to inquire into the death of William Peek, the evidence given at which illustrates the carelessness with which poisons are kept by many persons who are in the habit of using them for the purposes of their business.

It appeared that the deceased had been transacting some business with Mr. Chambers, a watchmaker of that town, and asked for a glass of beer, which was given him. Shortly afterwards he was seen by an acquaintance leaning against a wall, apparently very ill. He was taken back to Mr. Chambers's, and medical assistance obtained, but died about an hour afterwards.

Mr. W. Chambers said that the deceased having asked for a glass of beer, he told his wife to bring the bottle of beer from the parlour, and pour out a glass. She did so, and the deceased drank it, and remarked that it was very nice. He had another bottle in his workshop, labelled "gilding solution," containing cyanide of potassium, muriatic acid, ammonia and water. Since the accident he had labelled that bottle "Poison." An hour or two before Peek came in he sent for some beer, a portion of which he mixed with the gilding-solution; the remainder was put into a bottle. He supposed that after he had done gilding he had poured the remainder of the gilding solution into the same bottle, as it was standing side by side with the gilding-solution bottle, but he had no recollection of so doing. He afterwards took the bottle into the parlour, with the intention of drinking the beer it contained at supper, and, if Peck had not come in when he did, undoubtedly himself and his wife would have drunk it. The bottle containing the gilding solution was generally kept, with several other bottles containing acids, etc., in a cupboard on the cellar stairs.

Mr. Wright, surgeon, said that he found the deceased in a state of great nervous depression, and insensible. He placed him in a semi-erect position, and poured some solution of ammonia down his throat. A galvanic battery was also used with some apparent benefit, but death ensued soon afterwards. He was sure it had been caused by cyanide of potassium. He remarked that in his opinion there was enough cyanide of potassium in the glass of beer which the deceased drank to poison upwards of twenty people.

The coroner said that from the evidence there could be no doubt that the poison was placed in the beer accidentally, but Chambers had been guilty of gross carelessness. The bottle of poison, also, was left in such a manner that any person might have drunk from it, not even the word poison having been put on it till after the fatal occurrence.

The jury returned a verdict "That death was caused by poison administered accidentally, but under circumstances of gross carelessness on the part of Mr. Chambers."

BOOKS RECEIVED.

Anæsthetics. By Edward R. Squibb, M.D. Yew York. 1871. From the Author.

Curiosités de l'Alimentation. By Dr. J. L. Soubeiran. Paris. 1871. From the Author.

Proceedings of the American Pharmaceutical Association at the Eighteenth Annual Meeting, held in Baltimore in September, 1870; also the Constitution and Roll of Members. Philadelphia. 1870.

The following journals have been received:—The 'British Medical Journal,' April 15; the 'Medical Times and Gazette,' April 15; the 'Lancet,' April 15; the 'Medical Press and Circular,' April 19; 'Nature,' April 13; the 'Chemical News,' April 14; 'Journal of the Society of Arts,' April 12; 'Gardeners' Chronicle,' April 15; the 'Grocer,' April 15; 'Produce Markets Review,' April 15; the 'English Mechanic,' April 14; the 'American Journal of Pharmacy' for April; the 'Chicago Pharmacist' for March; ; the 'New York Druggists' Circular' for April; the 'New York Medical Record,' April 1; the 'North China Daily News,' February 18.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[191.]—SOLVENT OF WHITE SHELLAC.—The reply of Mr. Allen as to *the insolubility of white lac a fortnight after its preparation* is only a partial truth. I have kept it in glass-stoppered bottles and in stone jars for many months without its solubility being in any degree impaired.—J. WHITFIELD.

[204.]—LINIMENTUM RUBRUM.—*F. J. Machin* sends the following formula:—

R. Ol. Succini Rect. ♏xx
Ol. Carui ʒj
Ol. Terebinth. ℥ij
Ol. Rubri ℥iv
Otto Rosæ gtt. iv
Ol. Lini ad ℥xvj.

M. ft. Linimentum.

[211.]—HORTICULTURAL INK.—Bichloride of platinum dissolved in distilled water forms an *indelible ink* for writing on zinc or brass labels. N.B.—Must be used with a quill pen.—J. J. THOMAS, *Weymouth.*

[222.]—TINCT. COLOCYNTH.—Neligan gives the following formula:—

Colocynth ʒj
Star Anise ʒj
Rectified Spirit f℥xiv.

Digest for three days and filter.—J. WHITFIELD.

TUBA ROOTS.—We have received the following communication from Dr. J. E. De Vry:—In reference to the notice on tuba roots on p. 790 of your valued periodical, I take the liberty to inform you that the natives in Java use under that name *Dalbergia heterophylla* and *D. purpurea* to narcotize fishes with the intention to catch them. I suppose these are the same plants which are used in Borneo under the name of tuba or tooba.

The Hague, 6th April, 1871.

PARRISH'S SYRUP OF THE PHOSPHATES, OR CHEMICAL FOOD.—For the information of several of our correspondents, we reproduce the formula for the above, from Parrish's 'Practical Pharmacy.'

Parrish's Compound Syrup of Phosphates.

Take of Protosulphate of Iron ʒx
Phosphate of Soda ʒxij
Phosphate of Lime ʒxij
Phosphoric Acid, Glacial, ʒxx
Carbonate of Soda ℈ij
Carbonate of Potassa ʒj
Muriatic Acid
Water of Ammonia, of each, sufficient
Powdered Cochineal ʒij
Water, sufficient
Sugar lb.ij ℥viij, offic.
Orange-flower Water f℥j.

Dissolve the sulphate of iron in f℥ij of boiling water, and the phosphate of soda in f℥iv of boiling water. Mix the solutions and wash the precipitated phosphate of iron till the washings are tasteless. Dissolve the phosphate of lime in four fluid ounces of boiling water with sufficient muriatic acid to make a clear solution; when cool, precipitate it with water of ammonia, and wash the precipitate.

To the freshly-precipitated phosphates, as thus prepared, add the phosphoric acid previously dissolved in water; when clear, add the carbonates of soda and potassa, previously dissolved in water, and muriatic acid to dissolve any precipitate. Now dilute with water till it reaches the measure of 22 fluid ounces, add the sugar, and towards the last, the cochineal; dissolve by the aid of heat, strain, and, when cool, add the orange-flower water.

As thus made, each teaspoonful contains about $2\frac{1}{2}$ grains of phosphate of lime, 1 grain of phosphate of iron, with fractions of a grain of phosphates of soda and potassa, besides free phosphoric and hydrochloric acids. The solution is perfect, the taste agreeably acid and the flavour pleasant. The disposition to precipitate a bulky sediment of the insoluble phosphates is one of the greatest annoyances in this preparation, when made on a large scale, and can be obviated best by substituting hydrochloric acid for a suitable portion of the phosphoric acid used, taking care to separate the liquid into two portions, and adding the carbonate of soda and potassa to that consisting exclusively of the phosphoric acid solution, lest portions of chloride of sodium and chloride of potassium should be formed and contaminate the resulting solution.

Owing to the uncertain strength of phosphoric acid of commerce, being a mixture of the monobasic, bibasic, and tribasic acids, and always being contaminated with earthy phosphates, there is some uncertainty about the proportions to be employed in the above formula. These considerations have induced the trial of a method by double decomposition, which should always furnish a uniform strength of acid from a cheap and accessible source.

E. Scheffer, of Louisville, Ky., has proposed to take 49·25 drachms of phosphate of lime, 34·125 monohydrated sulphuric acid, diluted with three times its weight of water, put them in a thin dish and heat on a water-bath for half a day. By this process only 37·25 drachms of phosphate of lime will be decomposed by the sulphuric acid which combines with the lime of these 37·25 drachms to form sulphate of lime, while the phosphoric acid is set free and holds the other twelve drachms of phosphate of lime in solution. After it has cooled, the magma is pressed, macerated with fresh water, and again pressed, and the liquid evaporated, if necessary, to twenty fluid ounces, cooled and filtered. The phosphate of iron and carbonate of potassa and soda are now added as in my own recipe, and the whole made into a syrup *secundum artem.*

The washing of the precipitated sulphate of lime is best performed in a funnel, the water being thrown upon the middle in a kind of reservoir formed by raising the precipitate on the sides of the funnel; the last portions are collected separately and evaporated until, with the stronger portion, they have the desired measure.

Dr. Joseph G. Richardson, of Philadelphia, has proposed to use citric acid as the solvent for the phosphates in the compound syrup; this substitution, though probably modifying the therapeutic properties of the preparation, furnishes it in a very agreeable form.

We are indebted to the *Chicago Pharmacist* for the following formulæ:—

BORAX AND GLYCERINE.

Take of Borate of Soda in fine powder, 1 part.
Glycerine, 2 parts.

Mix, perfume, and colour with cochineal.

MEDICATED PRUNES.

Take of Senna leaves, 2 parts.
Boiling water, 16 parts.

Macerate for an hour and strain; add to this infusion,

Prunes (stoned), 32 parts.
Sugar (crushed), 10 parts.

Boil together, with constant stirring, for about ten minutes, and evaporate by means of a water-bath, until reduced to a pulpy consistence; add to each pound of this confection,

Citric Acid, in fine powder, 1 drachm.
Tincture of Ginger, 1 fluid ounce.

Mix.

CULINARY ESSENCES.

Flavour of Almond.

Take of Oil of Bitter Almonds 1 fl. drm.
Alcohol, 95 per cent. 10 fl. oz.
Water 6 fl. oz.

Dissolve the oil in the alcohol and add the water, and filter. This flavour should not be sold without a caution as to its poisonous nature, and directions as to the quantity to be used.

Flavour of Caraway.

Take of Caraway Seed, bruised, 1 oz. troy
Oil of Caraway Seed 2 fl. drms.
Diluted Alcohol 16 fl. oz.

Digest for eight or ten days and filter.

Flavour of Celery.

Take of Celery Seed, bruised, 4 oz. troy
Diluted Alcohol 16 fl. oz.

Digest for eight or ten days and filter.

Flavour of Cinnamon.

Take of Ceylon Cinnamon, brused, 2 oz. troy
Oil of Cinnamon ½ fl. drm.
Diluted Alcohol 16 fl. oz.

Digest for fourteen days and filter.

Flavour of Cloves.

Take of Cloves, bruised, 1 oz. troy
Oil of Cloves 2 fl. drms.
Diluted Alcohol 16 fl. oz.

Digest for eight or ten days and filter.

[225.]—CONCENTRATED INFUSIONS.—*G. M.* would be glad to receive information as to the best method of preparing concentrated infusions which will keep.

[*** We think the best way is to avoid concentrated preparations, and use fresh infusions. These may be prepared in a very short time. See a paper by Mr. Barnes on the subject, *ante*, p. 368, and another by Mr. Allchin, *ante*, pp. 421, 481. —Ed. Pharm. Journ.]

[226.]—COD-LIVER OIL JELLY.—*C. E. L. N.* would be obliged if any one would favour him with particulars of the manipulation for the formula which appeared in the Journal for April 8 [210]. The ingredients and proportion were named, but not the way of mixing. He has tried it several ways, but failed to make anything like an *elegant* preparation.—A. P. S.

[227.]—PREPARATION OF POMADES.—I should be glad if any reader could inform me of a remedy for preventing the steamed appearance on the sides of pomade bottles after they are filled and the pomade becomes cold. I have tried warming the bottles, and deferred putting the pomade into the bottles until almost solid, but with no better result. —"Moelline."

[228.]—SYRUPUS TONICUS.—You will oblige by saying in next publication of your Journal what should be dispensed for *syrupus tonicus* in a prescription (a Manchester prescription).—T. P. B.

[229.]—STRAINERS.—What is the best straining material for the dispensing counter—*tow* excepted?—J. W.

[230.]—SILVERING FOR PILLS.—What is the best substitute for mucilage of gum arabic in silvering pills?—J. W.

[231.]—BEETLE POWDER.—Can any reader oblige me with a good formula?—"Give and Take."

[232.]—LIQUID DENTIFRICE.—I should be obliged by a formula which is effectual and agreeable.—Tooth.

[233.]—PLATE POWDER for polishing brass, silver, etc. Will be obliged for a good recipe.—G. H.

[234.]—A PROBLEM FROM DOVER.—What should be the colour and consistence of this medicine, and in what order should the ingredients be mixed? The person who brought the prescription said he never had it made up twice consecutively the same colour.

A Copy.

℞. Liq. Quiniæ Ammon. ℥iss
Syr. Ferri Phosph. ℥j
Ferri Ammon. Citr. ʒj
Acid. Phosph. Dil. ʒiss
Aquæ Menth. Pip. ʒiiss
Ammon. Phosphat. ʒiij

M. ft. mistura.—A. B.

[235.]—MINERAL OILS.—Would any scientific reader tell me to what is attributable the peculiar "bloom" so characteristic of refined mineral oils, and inform me if there is any process by which this may be got rid of? The "bloom" much resembles that of quinine in solution.—A. P. B.

[*** The character referred to is an instance of fluorescence similar to that familiar to pharmacists in a solution of quinine. See an article by Professor Flückiger, *ante*, p. 682.—Ed. Pharm. Journ.]

Correspondence.

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

Has Public Opinion, as indicated by the Press, demanded Compulsory Regulations for the Storing, etc. of Poisons?

Sir,—I beg to hand you the enclosed correspondence.

So lately as March 31st, Mr. Dymond reiterated in a public meeting the argument in favour of accepting the compulsory regulations, "that the press demanded it, and they knew that the public approved it."

In a parenthesis, Mr. Dymond is reported to have thrown in a contradiction of something which he wrongly assumed I had said, and he attempts to thrust forward this side issue as a shield against my demand for the proofs of his own assertion.

I am not aware that any public interest or advantage would result from my complying with Mr. Dymond's request to make a particular statement, in order that he may disprove it. But, on the other hand, I recognize great importance in the main issue between us, and I now publicly ask Mr. Dymond to tell us how many of the "3370 newspapers and periodicals" he can put forward to support his assertion?

I forbear to allude to other aspects of the general question, beyond expressing the hope that the sound common sense of the trade, which has averted the immediate danger of compulsion, will closely scrutinize the alternative scheme to be offered. To be led into the approval and recommendation of any system which closely resembled the original one would be an illogical act, not unlikely to bring speedy punishment by the compulsory enactment of the measures which we had declared to be desirable, and had recommended for adoption.

Morecambe, April 17th, 1871. Rich. Reynolds.

(No. 1.)

"*April* 8, 1871.

"My dear Mr. Dymond,—I notice in the Pharmaceutical Journal of to-day, that at a meeting held in Birmingham you referred to me in the following words, viz., 'Mr. Reynolds was quite mistaken when he declared that only two papers had spoken on the subject' (that of regulating the storing, etc. of poisons).

"After this public statement of my being 'quite mistaken,' I must ask you to give the evidence requisite to support it, viz. the names and dates of the papers other than the *Lancet* and *Pall Mall Gazette*, and what they said in favour of the regulations.

"I will consider your reply as being public, and am, faithfully yours,

"Richd. Reynolds."

(No. 2.)

"*April* 11, 1871.

"My dear Mr. Reynolds,—Owing to my absence from home, your letter has not come into my possession until this afternoon.

"I cannot recognize your demand that I should prove a statement of my own, until I have an assurance from you that you are prepared to prove the truth of the inference of yours which is opposed to it. In your letter of Feb. 14 (Pharm. Journ., Feb. 18), you draw the conclusion that because the Pharmaceutical Journal had not reproduced articles on the suggested poison regulations from more than two papers, therefore no more than two papers had contained articles on the subject. Such a statement would have been amusing from its simplicity, if an absurd inference had not been drawn from it which was intended to damage the Council, of which you are a member, and you now ask me to disprove your remark!

"There are, as you doubtless know, about 3370 newspapers and periodical publications of various kinds unconnected with the drug trade, making about 180,000 appearances in the course of the year. If you will first plainly assert, and be prepared to prove, that from the date of the publication of the suggested poison regulations (Jan. 1, 1870) to the date of your statement (Feb. 14, 1871) no more than two of these papers contained any notice of or articles on the subject, I will then upset your proof by naming another daily newspaper (which will be enough for the present purpose) in which such an article did appear.

"I am, yours very faithfully,
"GEORGE DYMOND."

THE PRELIMINARY EXAMINATION.

Sir,—If you will kindly allow this a corner in your much-esteemed Journal, perhaps it may be the means of directing the attention of some one (more competent than myself) to the subject which I wish to lay before your readers.

When up at Bloomsbury Square for the Modified Examination, I heard many express regret at being compelled to pass the Preliminary Examination (even although successful in the Modified) before being eligible for the "Minor" or "Major." Now, Sir, I am confident many would go in for the Minor and Major qualifications were it not for that great stumbling-block, the Preliminary. Those gentlemen who go up for the Modified are mostly men well up in years, and the greater part of them have forgotten any smattering they may have had about Cæsar and other Latin authors. In fact, many have never had any acquaintance with that ancient worthy. Few men in the drug business have time to spare for the study of classics. But in working up for the Minor and Major, the student feels that he is studying subjects which are of practical and lasting benefit. I do not advocate the abolition of the Preliminary Examination; far from it. I think it is only fair and reasonable to expect the young members (who, for the most part, have just left school) to be able to show that they have a fair classical education. But I must say it is hard for us older members, who have "grown grey with age," to be compelled to "fight our battles o'er again," and study up the "History of the Gallic War," etc. I hope the Council will "be merciful," and grant the request of those who have passed the Modified, and admit them to the Minor and Major without enforcing the Preliminary. I am sure they will have the gratitude of all "Modified men," and by adopting this "liberal policy" the number of Pharmaceutical Chemists will be increased threefold, and will crush the jealousy which now exists between Pharmaceutical Chemists and "Chemists by Examination," as some individuals term themselves. Therefore, let me urge upon the Council the propriety of sweeping away the Preliminary in the case of those who have passed the Modified, and I think that it ought to count for something. I hope that some one will champion our cause. B. S.

POISON REGULATIONS.

Sir,—This poison question has drawn my attention so forcibly to the influence and position of the Council of the Pharmaceutical Society, that on receiving the Journal of last week, I read over the names of the gentlemen who have been nominated for election for the ensuing year with critical curiosity. Some of the names are quite unknown to me, and as to their opinions on what I consider the vital points of pharmaceutical advancement, I have not the remotest idea; and in a short time I shall receive my voting-paper, drawn up in accordance with the bye-laws, leaving me in the same blissful ignorance.

The present Council some time ago sent me a code of regulations as to the storing of poisons, recommended by them for our adoption at the next general meeting. I assumed, therefore, that they meant to take their stand on their principles of action. The next thing I hear is that only one Councillor dared to nail his colours to the mast to meet the coming storm.

I ask, is the question of storing poisons to be discussed at the general meeting or not?

What is the line of policy marked out in the brains of the coming men who aspire to constitute, in part, the future Council?

And what is this question? The Pharmaceutical Society was founded for the advancement of pharmacy and for the protection of our privileges. We are becoming eminently qualified by our education to undertake the dispensing of this country, awaiting the time when public opinion shall demand that the man who prescribes a poison shall not compound it.

Every one knows where the *great bulk* of the medicine of this country is dispensed, and every man in our calling knows perfectly well what a growing dissatisfaction there is among the people against secret medicine and possible secret error. The Parliament has passed a Poison Bill and the Privy Council are desirous its provisions should be carried out. It appears to be met by the chemists with a determined opposition. Could anything, as a matter of policy, be more eminently suicidal? A greater blow could not have been delivered at the surgeries of this land than the adoption of a system of poison regulations in chemists' shops *where prescriptions are dispensed.*

Many of us who know the heavy responsibilities resting upon us adopt some system of poison closets; but we are a slow people. I instance the question of poison bottles and the stupid arguments brought against them some years ago. How has that opposition died? Are poison bottles adopted by dispensing-houses? Here and there possibly some obstinate chemist will not use them,—and it is just so with our poisons. Some obstinate employers will keep their tincture of aconite next their tincture of orange, their laudanum next the tincture of rhubarb, or their arsenic not far from the magnesia, and so long as they use them themselves it is their own matter; but if they believe the Privy Council will allow them to impose such terrible risks on others, they are very much mistaken. Parliament, now that attention has been called to it, will see the necessity of enforcing some plan, and who are so able to design it as ourselves? hence the vast importance we ought to attach to the election of the Council this year arises. Who are the men? What is their standing in the trade and the Society? and above all, what are their opinions? Are they the right men to meet the emergency, or is this spasm of discontent but a nightmare of apathy?

GEORGE MEE.

79, Grosvenor Road, Highbury New Park, N.
April 18th, 1871.

Sir,—I heartily congratulate the Council on the wise course it has taken in abandoning the intention of proposing any compulsory poison regulations at the next General Meeting.

Mr. Reynolds's letter in the Journal of February 18th quite prepared me for the President's retirement, and I deeply regret he has left on record any animus towards a large majority of our brethren, whom he accuses of raising "a wild unreasoning clamour on a mere sentimental grievance," sneeringly stating "that he was not shaken by the 'tall talk' resounding about him."

It is most clear Mr. Sandford is not the man to uphold our reputation and independence. He plainly tells us, "that should other parties try their hand at the work of compulsory poison regulations, he, for one, should be unable to say there is no cause for interference." I, therefore, fully agree with his explanation as touching his immediate retirement, "that in doing so he best advanced the interest and honour of the Society."

I forbear making any further comment, as these few lines are written more for the purpose of tendering my best thanks to the members of the Council for the manly course they have taken in upholding our position, and I shall be most happy in supporting them all at the next General Meeting.

Kilburn, April 17th. JOHN BEATON.

THE ADULTERATION BILL.

Sir,—Allow me, through the medium of the Journal, to urge upon the Council of the Pharmaceutical Society immediate action against Mr. Muntz's Adulteration Bill. I do not hesitate to affirm that if that Bill should become law, no chemist, however straight he might desire to keep, would be safe. We have already an Adulteration Act, which answers all practical purposes. It is well known that nearly all adulterations of drugs take place abroad, and therefore if this Bill is to pass, it must be insisted that all drugs shall be analysed before imported into this country; there must be supervision of chemical manufactories, and there ought also to be appointed a staff of analysts to examine and test drugs and chemicals for those who have not the time or the skill to do so.

Is it not much better to take the bull by the horns than calmly to wait till mischief is done? According to our present laws no chemist dare prescribe for a patient over the counter a cough mixture of oxymel of squills and paregoric without labelling the same with the ominous word "poison," unless he renders himself liable to a fine! All chemists may not be aware of this fact. Neither must he sell a 6*d.* bottle of benzine collas, or benzine anything else, unless he has a special licence for so doing,—which no one, at least in this town, has been able to obtain,—without rendering himself liable to a penalty of £20! All chemists may not be aware of this.

And yet such is the absurd state of the law. And if absurd, why has it not been repealed? I answer, because of the difficulty of getting any law repealed.

A COUNTRY MEMBER.

Maidstone, April 8th, 1871.

THE NOMENCLATURE OF THE PHARMACOPŒIA.

Sir,—To the accident of my name being mentioned by Prof. Attfield at the last Evening Meeting you owe this letter.

I aim at the every-day and practical only, not the theoretic or scientific.

I would again urge upon those having power and authority the great desirableness of distinguishing in the next B.P. between oils proper and "Essential"—so called. Why should the word "Essence" be diverted from its strict meaning and common acceptation only when employed in pharmacy? Ordinarily it signifies the distinguishing quality of a thing, or, at least, a concentration of its strength or efficacy; but in the Pharmacopœia it stands for—a dilution of one part to four; and in retail usage for proportions often much weaker. Let the essential oils be denominated "Essences," and their dilutions S. V. R. spirits. Surely no precise strength is necessary to constitute a "spirit."

What objection can there be to substituting "massa" for "pilula," seeing that it has long been so far sanctioned in practice as to make it impossible to misunderstand it? Or, perhaps better still, "pila" for the lump, "pilula for its small subdivisions?

Again. What more absurd than to call a plaster ready for use by the same name as the Composition from which it is made?—as common-sense-like as to call a table "a wood." What objection to "plasma," "plastum," or "plastrum," whichever be the best Greek?

The same objection holds to "glycerinum" for "glyceridum."

I have often regretted that Sir Humphry Davy ever invented that awkward and unmanageable (in composition) word "chlorine." "Murine," which must have first suggested itself, and for which chlorine was substituted, would have been more euphonious, more manageable, and would have affected no disturbance whatever. For my own part, I am decidedly of opinion that it would be, even now, a *gain* to go back to "muriatic," "muriates," and to coin "murine," and, if needful, "murides."

Many have been the suggestions for effectually distinguishing between calomel and corrosive sublimate. Here is another. Let the textual name for the first be "calomelas," with an authorized chemical synonym, for disguise, underneath, and for the other "calomelas *muriata*." The utmost extreme of hasty contraction *must* add the "*m*" for the more dangerous article, and that would be effective; whilst "calom. muriat." could not possibly be misinterpreted.

T. LOWE.

Breckfield Road North, Liverpool, April 8th, 1871.

PREVIOUS SEWAGE OR ANIMAL CONTAMINATION IN POTABLE WATERS.

Sir,—It is with the greatest diffidence that I venture to put myself, even in the slightest degree, in opposition to so eminent an authority as Dr. Frankland, but I cannot allow his charge of misquotation and misrepresentation contained in his letter to you of last week to go unanswered.

In the paper he refers to, I made use of the term "previous sewage contamination;" and Dr. Frankland says that this is a misquotation, and that it should have been "previous sewage and animal contamination (estimated)."

On reading Dr. Frankland's letter, I immediately referred to his latest published paper, viz. that read before the Chemical Society a few weeks ago, "On the Development of Fungi in Potable Waters," and there, although I found mention twice of the term "previous sewage and animal contamination," I could nowhere find any mention of "previous sewage and animal contamination (estimated)." Where, then, is my misquotation? And even if I had omitted the word "estimated," what difference could it possibly have made?

In the same paper, Dr. Frankland gives the results of several analyses of potable waters that he has lately made I will take the first three on the list.

	1.	2.	3.
Ammonia	·161	·027	·110
Organic nitrogen . .	·106	·100	·126
Nitrogen as nitrates, etc.	4·384	1·637	0
Total combined nitrogen	4·603	1·760	·217
Previous sewage or animal contamination	44850	16270	590

It will be seen that, as a matter of course, the "nitrogen as nitrates and nitrites" is contained in the "total combined nitrogen," and also that from this "total combined nitrogen" the "previous sewage or animal contamination" is calculated; and yet Dr. Frankland denies my statement, "that from the nitrates present he calculates how great the previous sewage contamination has been!"

I did not for a moment suppose that Dr. Frankland would consider the evidence I have brought forward in favour of nitrates being produced otherwise than by the oxidation of sewage or animal matter conclusive. I am glad to learn he is investigating the subject, and, as my only object is to get at the truth, I shall equally welcome his decision whether it be for or against me.

Bath, April 10th, 1871. CHARLES EKIN.

We have been requested to publish the following correspondence:—

Hampstead, April 8th, 1871.

Gentlemen,—I beg leave to inquire if you have any knowledge of a person calling himself Fischer or Fisher, representing himself as a scientific chemist, a Dane by birth, but long resident in Germany? The fact that in making an application to me for relief, he used your name, stating that you had offered him temporary employment, induces me to apply to you for information, with a view, should your reply not be of a satisfactory nature, of publishing the facts in order to put a stop to further depredation among chemists and others.

I am, gentlemen, yours very truly,

Messrs. F. C. Calvert and Co. CHAS. EVE.

Tower Chemical Works,
Bradford, Manchester,
April 10th, 1871.

Chas. Eve, Esq., Hampstead.

Sir,—In reply to your inquiry, we have to inform you that the man Fischer or *Fisher*, to whom you refer, is totally unknown to us. We are, Sir, yours respectfully,

F. C. CALVERT AND CO.

Tenax.—(1.) No. (2.) Hooker's 'Student's Flora,' published by Messrs. Macmillan, price 10*s*. 6*d*. (3.) The presence of lead in glycerine may be detected by means of sulphuretted hydrogen. (4.) Messrs. Macmillan, price 4*s*. 6*d*.

Delta.—An article, by F. C. Calvert, on "The Adulteration of Oils" will be found in the PHARMACEUTICAL JOURNAL, 1st Series, Vol. XIII. p. 356.

Medd's 'Pharmacopœial Botany.'—We are unable to give any information concerning the publication of the above work.

G. G.—The names referred to are those of persons who have been restored to membership upon payment of their arrears of subscription according to the bye-laws.

Walter Plumbly.—'Selecta è Præscriptis' is published by Messrs. Churchill, New Burlington Street, price 5*s*.

The Royal Nuptial Bouquet.—We beg to acknowledge the receipt of a sample case of this perfume, and regret that we are unable to chronicle its merits, otherwise than in our advertisement columns.

J. H. Talbot.—You need not have any fear of any explosion under the circumstances stated.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Wilkinson, Mr. W. W. Stoddart, Mr. Jackson, Mr. E. Hall, Mr. G. C. Kernot, Mr. A. H. Mason, Mr. F. O. Collins, Mr. J. T. Robinson, Mr. A. R. Walden, Mr. A. W. Gerrard, Mr. G. Adam, A. P. B., H., C. T. J., W. J., P. C., C. W. S., "Delta," "Boiler Composition," "Inquirer."

VARIABILITY IN THE ACTIVITY OF LEAVES.

BY M. C. COOKE, M.A.

It is well enough known that the parts of plants collected for pharmaceutical purposes are subject to considerable variation, that they are by no means uniform in the proportions of their constituents, and hence are sometimes likely to fail. Many instructions have from time to time been given for the collection of roots, rhizomes, bark, etc., in order that uniformity might be more readily predicated. The plant just before the period of flowering is, in many of its parts, stronger or weaker in certain constituents than at other periods. Of all parts, perhaps, roots require the greatest care as to the time at which collected. Next in order, as it seems to us, are leaves. There are not many leaves of indigenous plants that are of much importance as articles of materia medica; but there are a few, and if these few are to maintain their position, it is of the utmost importance that they should be uniform in their action, which cannot be the case if no regard be paid to certain facts associated with plant life.

It may be asked with reason, is there any season or any condition which so influences the development of active principles in the leaves of plants as materially to affect their value as remedial agents? Undoubtedly there is, but not so much affecting cultivated as wild plants, because in the former the conditions are more uniform. Setting aside all question about periods of flowering or fruiting, or, in fact, of any period in the history of any individual plant, there seems to be one very important influence which is very much ignored, as affecting condition. This may be illustrated by reference to an example in which active principles are developed in a high degree, and in which the opportunity for testing is easily secured. The facts which seem to manifest themselves clearly and unmistakably in tobacco leaf, may be supposed to influence belladonna leaves, stramonium leaves, and even the leaves of other plants not in the least allied to them.

It is admitted that tobacco grown in a cold climate is much stronger than that grown in a mild one. In other words, active principles are more concentrated in leaves grown in cold climates, where the vegetation is less vigorous, than in warm ones. When the tobacco plant is forced on to a rapid growth, with a plentiful supply of moisture, the leaf is found to contain less of its characteristic principles than when stunted, starved, and but slowly developed.

Not only is this true of tobacco, but it is true also of other plants which have been tested. It is true of cultivated celery that the petioles and leaves are much more strongly flavoured when grown slowly than when grown rapidly, and under favourable conditions of soil and moisture. Except as they influence rapidity of growth, it is very doubtful whether the chemical constituents of a soil affect in any appreciable degree the active principles of leaves.

Take another example, although not, perhaps, quite so pertinent. In a very dry season, or when growing in very dry localities, the leaves of the common nettle are much more highly charged with their irritating poison than when grown rapidly, in a wet season, or in a moist locality.

From these and similar instances, therefore, we are led to the conclusion that rapid growth, with a plentiful supply of moisture, is least favourable to the development of those properties in leaves which are of value in medicine. Whether this principle holds good with glandular plants, secreting essential oil, such as the *Labiatæ*, we are not prepared to affirm from actual experience. The inference is, that leaves grown in a dry season would, *ceteris paribus*, be more active than leaves grown in a wet one; that plants grown in a damp situation or a rich stimulating soil would be milder than those grown under less favourable conditions. In fact, we have found the leaf of *Arum maculatum* to vary considerably in its biting acrid properties in proportion to its development. Leaves from large rapidly growing plants in moist situations are by no means so acrid as the small leaves of stunted plants growing on dry banks. This is an experiment which any one can perform for himself during a country stroll.

It would be of interest to ascertain by careful analysis what is the difference in the proportions of the constituents of such leaves as belladonna and stramonium, grown under the two conditions of vigorous and retarded vegetation. The very rough test applied to the leaves of arum, and the inexact one applied to tobacco, indicate strongly enough that there must be a very appreciable difference; but this is in itself insufficient, it should be determined what *is* the difference; and we have no doubt it will be sufficient to account for much of the variability in the action of leaves.

A less important circumstance, but one which should not be lost sight of in this connection, is the difference between fully matured and young leaves from the same plant. There can be no doubt that there is a difference, but the proportion of young leaves, weight for weight, to mature leaves will not be great when dried, because the larger percentage of water in young leaves will reduce the disproportion, as well as the excess of mature leaves which will be collected from a full grown plant, over immatured ones.

From these suggestions it seems to us that the pharmacologist may collect some of the causes that influence the variability in activity of leaves gathered and dried indiscriminately. It is quite possible that in some instances foliaceous drugs have been condemned for their uncertainty, when the fault has really been traceable to an unsystematic and indiscriminate mode of collection. The results of recent experiments on the influence of climate, soil, moisture, and other external circumstances, upon the development of active principles and aroma in tobacco leaves, incline us to the opinion that, not only in that instance, but in many others, the circumstances and their influences have been too much forgotten or ignored. With this impression we have ventured to direct attention to the subject, in the pages of a journal which is interested more than any other in pure and uniform drugs.

Vinca Major.—Mr. Spencer Wells states that in some cases of menorrhagic bleeding he has found a preparation of *Vinca major*, the well-known Greater Periwinkle of our shrubberies, preferable to lime, gallic acid or ergot. He was first told of it by Mr. Squire, and has prescribed it according to the formula given in that gentleman's 'Companion to the British Pharmacopœia,' viz. an infusion of 2 ounces of dried herb to 20 ounces of boiling water, and strained when cold.—*British Medical Journal.*

ADDITIONAL REMARKS ON

THE CHEMICAL NOMENCLATURE OF THE BRITISH PHARMACOPŒIA.

BY PROFESSOR ATTFIELD.

The discussion on this paper at a recent Pharmaceutical Meeting extended so much beyond the usual hour of adjournment that I could only express my appreciation of the support the chief suggestions received; I would now reply to one or two of the points raised, and make some additional observations.

The Proposed System of Pharmaceutical Nomenclature.—It will be remembered that my leading proposition was, "that the compounds of the alkali metals and alkaline earth metals, instead of being named as hitherto, on two distinct systems, should follow but one; that instead of salts of potassium and potash we should have salts of potassium only; instead of sodium and soda compounds sodium only; and so with preparations of ammonium, lithium, calcium, magnesium and aluminium." The eminent chemical and pharmaceutical authorities who spoke on the occasion—Professors Frankland, Odling, and Redwood—entirely concurred with this suggestion, and I have now the gratification of stating that the leading weekly medical periodicals—the *Lancet*, *Medical Times and Gazette* and *British Medical Journal*—have given their support to the plan; in short, that no objection to it has at present been raised.

With respect to the question of Professor Frankland as to the method of distinguishing between similar salts of one metal, *e. g.* the two sulphates of iron, I would, whenever such a course may become necessary, add to the name a word or an initial syllable recalling some prominent difference in the properties of the two compounds: thus, *green* sulphate of iron and *per*sulphate of iron; these names are, to the pharmacist, more familiar and distinctive than the more chemically useful names Professor Frankland proposes, "sulphate of ferrosum" and "sulphate of ferricum;" moreover, I fear that physicians in writing prescriptions would contract both the latter to *fer. sulph.* Again, there are two chlorides of tin, stannous chloride and stannic chloride, neither used in medicine, and only as analytical reagents in pharmacy; hence they might well be distinguished pharmaceutically as well as chemically by the names just given; or if it be undesirable to introduce this one exception to the general principle advocated, the compounds might be termed respectively *solid* chloride of tin and *liquid* chloride of tin, or *crystalline* chloride of tin and *per*chloride of tin.

With regard to the history of the chemical nomenclature at present employed in Pharmacopœias, I have said that it was only "mainly" devised by Lavoisier, and believe that I have followed general custom in speaking of it as the Lavoisierian method; at the same time there can be no doubt, as indicated by Professor Odling, that it was gradually developed by the contributions of many minds. "The system of nomenclature—the joint production of Lavoisier, De Morveau, Berthollet and Fourcroy—published in 1787 under the title 'Méthode de Nomenclature Chimique, proposée par MM. de Morveau, Lavoisier, Berthollet, et de Fourcroy,' still continues the foundation of the language which, with many variations in minor points, is employed by all chemists at the present day." (Professor G. C. Foster's article on "Nomenclature" in Watts's 'Dictionary of Chemistry.') I may add that the system I propose for adoption in medicine and pharmacy was employed in 1858 in Conington's 'Handbook of Chemical Analysis,' is much used in the dictionary just cited, is the leading nomenclature of the 'Manual of Chemistry' I first published in 1867, has since been included in the labels of the chemical specimens in the Pharmaceutical Society's museum, and for some years has been placed on the labels of at least one firm of English chemical manufacturers (Messrs. Hopkin and Williams). Hence it works well in practice. For scientific purposes it is scarcely sufficiently comprehensive; and for two or three years I have hesitated in proposing for applied chemistry a system of names not identical with the nomenclature of pure chemistry. As, however, there is still no indication that the two or three systems of names used by teachers of pure chemistry will ever merge into one, and as it would be impossible to employ more than one in applied chemistry, I do not think I act disloyally to, or influence otherwise than beneficially, the science I follow by selecting and adapting one of the current systems for permanent employment in medicine and pharmacy.

The Exceptional Alterations.—I adhere to the opinion that the old and perfectly well-understood name *arsenicum album* is preferable to *acidum arseniosum*. The body is not an acid in the sense in which every other acid in the Pharmacopœia is an acid, and, therefore, should not officially be termed an acid. Such irregularities are prejudicial to the interests of chemistry and confusing to students. As for other anhydrides, it will be time enough to discuss their nomenclature when good indications appear of their official recognition. Chromic anhydride, or chromic caustic, might be termed red caustic, or red oxide of chromium. In the cases of the subcarbonate and subnitrate of bismuth, and the subacetates of copper and lead, it has been considered by Professors Redwood and Odling that the prefix "sub" is not well substituted by "oxy," and I am disposed to agree in this opinion. Indeed, I have never strongly urged the adoption of the terms oxycarbonate, oxynitrate, oxyacetate, oxyhydrate as leading names, but have suggested that they would be highly serviceable as synonyms; I would now thus restrict the suggestion, and include in it the hydrato-carbonates of lead, magnesium and zinc. With respect to the "scale" preparations and some substances similarly named (tartarated antimony, tartarated iron, tartarated soda), I am glad to find that Professor Redwood coincides with me in thinking that the existing names admit of improvement. I have suggested that alterations in these names should go so far as to make them consistent with the corresponding names of the three citrates. My only objection to the six names my colleague mentioned (ammonio-citrate of bismuth, ferro-citrate of quinia or quinine, etc.), is that similar compound words (aceto-nitrate, methyl-ethyl) are employed in chemistry for the express purpose of suggesting intimate union between the bodies whose names are included in the compound word, no such union being pretended to exist in the case of these scaly and other preparations. There are some advantages to set against this objection, at the same time it is desirable that the nomenclature of chemistry and pharmacy should harmonize as much as possible. As for the names of the alkaloids, the balance of usage is in favour of "ine," instead of "ia," as the terminal syllable of the words; thus, morphine, quinine, strychnine,—not morphia, quinia, strychnia.

THE TAMARIND.

BY JOHN R. JACKSON, A.L.S.
Curator of Museums, Royal Gardens, Kew.

The Tamarind (*Tamarindus indica*, L.) is well known in this country as an agreeable and useful medicinal preserve. There is only one species of the genus, of which, however, there are two varieties, one growing in the East, and the other in the West Indies. The chief difference is in the length of the pods, those of the Eastern plant being from three to six inches long and slightly curved, and containing from six to twelve seeds, while the Western variety is shorter and seldom has more than four seeds. The trees grow to a great height, attaining in the East Indies eighty feet. The pinnate leaves and racemes of yellow and red-streaked flowers, with purple filaments, give it a pleasing and graceful appearance.

The wood is excessively hard, and so heavy that it sinks in water. It is peculiarly marked with broad chocolate-brown streaks. In the East Indies it is used for furniture and for general building purposes. Tamarinds, as seen in commerce, consist of the pulpy or fleshy part of the pods—after the outer shell has been removed—preserved in syrup or sugar. The mode of preserving them is either by throwing hot sugar from the boiler on the ripe, pulpy portion of the pods, or by placing alternate layers of tamarinds and sugar in stone jars: preserved in this way they are said to have a finer flavour and better colour. Tamarinds are valued with us, as well as in nearly all the countries where they grow, for their gentle laxative and cooling properties; they are, moreover, used in tropical countries as an article of food. In Sumatra they are salted and used in cooking and served at table, and in Western India they are used in preserving or pickling of fish. The leaves partake of the acid property of the fruit, and a decoction is employed in Ceylon for fomentations and in ophthalmic cases; they are, moreover, taken internally for the cure of jaundice. In Bengal an infusion is made from them and used in preparing a fixed yellow dye, in which silks, after having been previously dyed in indigo, are dipped and changed to a green.

The Tamarind-tree is said to exhale a large amount of acid, and the damp air becoming impregnated with it during the night, sensibly injures the fabric of cloths exposed to its influence for any length of time. On this account the natives have a strong objection to sleep under the trees. It has been said that no plants will grow under the shade of the Tamarind; but this is evidently a mistake, though it is not impossible that the acid has an injurious effect on some plants. The flowers are employed in Ceylon in the preparation of a confection which is considered valuable in liver complaints. The seeds, in times of scarcity, are eaten as food, being first roasted and then soaked for some hours in water, by which the hard outer skin is removed; they are afterwards boiled or fried and eaten. Simply pulverized, they are mixed with water into a thick paste, and applied to boils to promote suppuration. The powder is also boiled with thin glue, and is said to constitute one of the strongest of wood cements. Besides all these various uses of the Tamarind-tree, it is said that the native silversmiths in Southern India use a strong infusion of the acid fruits mixed with sea salt for cleaning and brightening silver.

EXTRACTUM CINCHONÆ FLAVÆ LIQUIDUM.

BY A. W. GERRARD,
Dispenser, Guy's Hospital.

Having some time since obtained this preparation from a different wholesale house than whence we usually purchased it, I was much surprised at the difference in taste, odour and colour from that we had been previously using. I was still further astonished when, on dispensing it with an alkali, it gave neither precipitate nor turbidity. I at once set some of this aside for examination, and at the first opportunity prepared some by the British Pharmacopœia; and having purchased three other samples, I engaged myself to determine their relative value.

We know that its medicinal properties are due to the alkaloids therein; and if it is made as instructed with the yellow bark, which should not contain less than two per cent. of quinine, a measured quantity should yield on precipitation with an alkali an amount of alkaloids not below a certain standard; what that standard is should, I think, be determined and introduced as a test in a future edition of the Pharmacopœia.

The following table shows the amount of washed and dried precipitate obtained from two drams of each on the addition of solution of potash:—

No.		Weight of Precipitate.	Colour.	Taste.
1	Home made.	grs. 10	Dark brown.	Aromatic bitter.
2	Purchased.	„ 10	„ „	„ „
3	„	„ 7	Brown.	Less bitter.
4	„	„ 3	Pale brown.	Slightly bitter.
5	„	„ 0	Very pale brown.	Sweetish and faintly bitter.

I subjected each of them to the test for quinine by the ether chlorine water and ammonia process, 1, 2, 3 and 4 gave the emerald green colour, 5 failed; 1 and 2 left the largest amount of quinine upon the watch-glass after the evaporation of the ether. I may here mention that a quick and ready method of proving the presence of quinine in this preparation is to place a thin layer on a piece of window-glass on drying and exposing to transmitted light, it will show the well-known fluorescence.

It is evident that this article, as met with in our pharmacies, is a very varying product. All of the samples except No. 1 came through respectable wholesale houses; that they should supply chemists with such diluted forms as 4 and 5 is deserving of censure, and warns us to be vigilant. The remedy for this is in our own hands. Every-day experience teaches that many preparations which are usually purchased should be home made. What proofs have we, that bought pill-masses, powders, liniments, etc., are not made with the commonest instead of the best materials? The chemist should get the root bark and leaf, and operate for himself; the result will amply repay the labour, and he has the self-gratification of knowing that what he sells is pure and unsophisticated. If the performance of these duties were the rule instead of the exception, we should not hear so much of the neglected apprentice, for had he the opportunity of handling the specimens and assisting to obtain their products, it would leave a far deeper impression on his memory than cramming from books, and fill him with that spirit of emulation which is the road to excellence.

THE ARTIFICIAL PREPARATION OF MANNITE.*

BY JOSEPH M. HIRSH, OF CHICAGO.

The preparation of artificial mannite, attempted at the instance of this honourable body, has been but a partial success, in so far as I could not in every instance obtain a product of exactly the same composition from the raw material, commercial glucose. Trials with pure grape-sugar invariably failed, in my hands, to produce that peculiar nauseous principle characteristic of manna.

For the sake of brevity, I shall mention the outlines of my experiments in this direction.

I made glucose in the usual manner from starch, leaving about 10 per cent. of dextrine in the same undecomposed, but did not concentrate the glucose more than to 15° Beaumé. To this solution I added 5 per cent. of wheat flour, 5 of molasses, and as much of common malt vinegar, when the mass was at a temperature of 100° F. In twenty-four hours a lively fermentation had set in, which continued for three days, when I concentrated the liquid, which then showed the peculiar nauseous taste and odour of manna. Digested with alcohol, mannite dissolved, crystallizing upon evaporation of the alcohol, while dextrine and other impurities remained behind undissolved.

The peculiar nauseous principle appears to be partly decomposed matter, undergoing a gradual change into humus. Whoever has been in a vinegar factory, badly conducted, where poor ventilation produces an incomplete oxidation of the alcohol, but rather decay, must at once be struck by the resemblance of this odour to that of manna. It was this experience which induced my experiments in the manner mentioned above, the gluten of the wheat-flour forming, together with the vinegar, an excellent ferment of putridity, which not only produces the nauseous, humus-like parts existing in manna, but also the molecular change of cane- and grape-sugar which converts it into mannite.

This artificial manna, in its action as a laxative, equals the true manna; and very likely the presence of a substance in a state of change, the active principle, is the same both in the true and the artificial manna. The mannite produced in this manner does not reduce aklaline cupric tartrate, showing the complete change of the glucose; but your reporter would beg leave to complete his researches, viz. on the elementary analysis of the artificial product, which pressure of business has prevented him from completing.

An accompanying sample of the manna produced will show how far my attempts have been successful. —*Proc. Amer. Pharm. Assoc.* 1870.

* Paper read at the meeting of the American Pharmaceutical Association, in answer to the query, "Can mannite be prepared artificially? and if so, how? And has it the same physiological properties?"

KOUMISS.

BY VICTOR JAGIELSKI, M.D.

The modern progress of physiological chemistry has advanced the position of dietetic remedies to great prominence in the practice of medicine. A particular knowledge of their properties becomes indispensable, therefore, to every physician who would keep pace in learning with the obligations due to his patients. Presuming, then, upon my long experience in the science and art of the subject, I offer these remarks upon Koumiss, for I was the first to introduce it to the British medical profession.

Koumiss accomplishes the twofold beneficence of a grateful food, which nourishes the debilitated body, and a potent physic that renews its failing vitality. It is the most important derivative of milk, which latter, in its various forms, has risen to such a value as a dietetic remedy, that special institutions in connection with its use in the treatment of disease are multiplying yearly throughout the Continent. Already 150 are in existence, with double that number of physicians attending at them, and many of these physicians are eminent in their profession.

In these milk institutions milk is used in its normal state—as buttermilk, as thick milk, and as whey, and sometimes even in association with mineral waters. Although there are no institutions of the kind in this country, yet milk and its derivatives are daily assuming a greater importance as aids to other systems of treatment in British medical practice.

In certain severe diseases, accompanied by emaciation and debility, they have recently established a high character as restoratives. Remedies of this kind, more especially in the expectant mode of treatment, have the advantage over hazardous medicines in being harmless at the worst. They are free from any anxiety to the physician, and are much more likely to produce the good effect which he desires in his patient; especially are they the more rational means with which to commence the treatment, for they may soon produce results in a comfortable way, which will dispense with the necessity of co-operative medicines.

To the habitual use of these natural hygienic beverages the inhabitants of certain territories owe their immunity from particular diseases. In that district called the Steppes of Russia, lying between lat. 55° 30′ N. to 40° N., and long. 40° E. to 79° 50′ E., and bordered by the river Don and the Lake of Baikal, inhabited by Kirgheses, Tartars, Bashkurs, etc. consumption is unknown. Moreover, the people of these lands are distinguished by their robust health and iron constitutions, notwithstanding that their nomadic habits subject them to a life of exposure and poverty; and yet almost their only food and drink is koumiss, for their religion, which is Mahommedan, forbids the use of other liquors.

The exemption of these people from phthisis was so remarkable as to induce travellers to comment upon it on their return home. Their reports soon attracted the attention of the Russian Government, and led to the organization of a scientific commission of inquiry into the general character of the country. One of the results of these investigations was to settle the fact that the health of the inhabitants is due chiefly to their simple diet of koumiss, which combines all the elements of nutrition in most digestible and assimilable forms.

The origin of the word Koumiss is unknown, but in the Tartar language it signifies 'silver.' This definition is probably intended to be suggestive of the *noble* qualities of that beverage. True koumiss is prepared from mares' milk by fermentation. It is a piquant, sweetly acidulous fragrant liquor, which, when taken *in very large quantities, at once* produces a pleasurable excitement, without any bad after effect, owing to a small quantity of alcohol which it contains. In the East this alcohol is separated by distillation into a liquor, which is called 'aracu.' This latter, however, differs from the koumiss in being an intoxicating liquor of the most injurious kind. Emaciated by their meagre rations of smoked meat during the long and rigid winters, the Tartars hail the approach of spring with great rejoicing, because it brings back to them the season of koumiss. The meadows, warmed and vivified by the thick snows of the winter, now bloom forth in luxurious pastures to restore the drooping bodies of the half-starved mares; and the poor animals, once more natural in blood and flesh, give abundantly of milk to make the koumiss, which serves in turn to nourish and invigorate their masters. It is the grateful feeling which is natural to this change from a bare subsistence to one of wholesome plenty that inspires the Tartars to reverence koumiss as of 'Divine origin.'

It should be here remarked that the mares of the Steppes are a hardy race of animals, and it not unfrequently happens that one of a drove which may drop her foal during the march will be able, with her colt, to resume the journey two hours afterwards. When the colt is weaned, the mare can only be induced to yield her milk by a *ruse*, which consists in making the colt stand by the side of the milker, and if the colt has been taken away, then it must be simulated by a stuffed dummy. The daily product of a good mare is two or three litres of milk, but only when the mare is milked frequently, say at intervals of every four hours.

Mare's milk assimilates closely in composition with woman's milk; and qualitatively it is not different from cow's milk, but it contains more of sugar (lactose) and less of butter and caseine than the latter. Mare's milk has a peculiarity which distinguishes two other kinds only, viz. those of the ass and the woman, and that is, rennet scarcely coagulates it.

Milks in general consist of 84 per cent. to 95 per cent. of water, and 16 per cent. to 5 per cent. of solid matters. The solid portion is made up of lactose, butter, caseine, albumen and mineral salts. The mineral salts consist chiefly of alkaline and earthy chlorides and phosphates. In addition, there are traces of various other constituents, some of which are doubtful. Although the milks of different animals resemble each other in quality, they are quite at variance as to the quantitative relations of their components; that is, in other words, species, race, and season, mode of employment, and, measurably, the kind of food, are controlling influences on this point.

The following table will show the average composition of the more important kinds of milk:—

	Woman	Cow.	Goat.	Sheep.	Ass.	Mare.
Sugar . . .	4·8	4·6	4·3	5·4	6·4	7·3
Butter . . .	2·9	3·6	3·4	2·4	1·3	2·1
Cheesy Matter .	2·9	5·1	4·4	4·8	1·9	} 1·5
Salts	2·21	0·6	0·8	0·9	—	
Total . . .	10·9	13·9	12·9	13·5	9·6	10·9

It will thus be seen that the milk of the ass and the mare are nearly alike as to the proportion of butter and caseine, and very nearly similar in the same respect to that of the woman; but the amount of sugar in woman's milk is much less than in either of the two others. Doubtless, therefore, it is the large proportion of sugar which these three contain that renders them pre-eminently suitable for the manufacture of koumiss; and of the three, mare's milk is the most favourable. But the reasons which cause cow's milk and sheep's milk to be less adapted for koumiss making have not yet been determined; possibly it may be owing to the greater amount of caseine, and some peculiarity of physical condition. Be that as it may, my own studies and experiments have enabled me to surmount all the practical difficulties in this connection, and to produce a koumiss which, for all therapeutic purposes, is the counterpart of that from mare's milk. By the skill thus acquired, I am also enabled to make koumiss of different modifications, as may be required for different diseases. This art of substitution enables us to have koumiss at our own homes: whereas it would be compulsory otherwise to go and drink it on the steppes of distant Tartary, as nowhere else are the mares in that requisite number and condition for being milked advantageously. The manipulations are of a nice character, and require experience and attention.

(*To be continued.*)

NOTE ON AMYLO-NITROUS ETHER.

BY JOHN M. MAISCH.

Mr. C. Umney* has recently examined three specimens of nitrite of amyl as met with in the English market, and found them all to be impure, one containing in fact very little of the true nitrite. This new remedial agent has also attracted some attention in this country; to what extent it is made here I have no means of ascertaining, nor am I prepared to give an opinion of the purity of the few samples I have seen. Since, however, its preparation is rather tedious, and since it is very apt to be contaminated with other ethers, the requisite care and precautions are probably not always applied.

Having had occasion, some time since, to prepare it repeatedly for medicinal purposes, the following remarks are offered as indicating a way of making nitrite of amyl on a convenient scale. Mr. Umney prefers the process of passing nitrous (hyponitric) acid into amylic alcohol. I regard this process as unnecessarily complicated, since purification by fractional distillation cannot be avoided, as demonstrated already by Rieckher.† According to Bunge,‡ 5½ oz. amylic alcohol require from eight to nine hours, before becoming completely saturated with nitrous acid; volatile products are given off, and the residue contains nitrite and valerianate of amyl, besides a black non-volatile body, crystals of nitrate of ammonia and probably nitrate of amyl. The process which was first suggested in 1844 by Balard, it seems to me, will answer all requirements, if the observations of W. Hoffmann§ regarding the formation of nitrate of amyl are not disregarded; ethyl-amylic ether, amylic aldehyde and hydrocyanic acid are likewise formed.

Of the three last-named compounds, the hydrocyanic acid is readily removed from the distillate by treatment with an alkali, which also separates any nitrous and nitric acid that may have come over. The aldehyde has its boiling-point at 93° C. (Kopp), and the ether above 110° C. These figures indicate the necessity of the cautels recommended by Balard, Hoffmann, Rieckher, etc.

It is advisable to use only rectified amylic alcohol, since the previous removal of ethylic alcohol is much easier than the removal of the products after the reaction with the nitric acid has been completed. This purification is most readily and economically effected by Hirsch's method,|| with solution of table salt and subsequent distillation with water.

The purified amylic alcohol with about an equal bulk of nitric acid is introduced into a capacious glass retort,

* Pharm. Journ. and Transactions, 1870, p. 422.
† Jahrb. f. pr. Chem. vol. xiv. p. 1.
‡ Krit. Zeitschr. vol. ix. p. 34.
§ Ann. Chem. und Pharm. vol. lxxv. p. 363.
|| See Amer. Jour. Pharm., 1862, p. 139, 328.

and a moderate heat is applied and very gradually increased. As soon as the mixture approaches boiling, the fire is removed and the reaction allowed to continue. If the application of the heat has been too rapid or too long continued, considerable frothing occurs and the contents of the retort are apt to foam over. With a moderate and slowly increased heat the reaction is less violent, and the temperature rises gradually after the removal of the fire and the beginning of boiling. As soon as the thermometer, inserted into the tubulus, rises above 100° C. (212° F.) the receiver is changed, the distillate now becoming more and more mixed with ethyl-amylic ether and nitrate of amyl, readily perceived by the change in odour.

The distillate obtained below 100° C. is now agitated with an aqueous solution of caustic or carbonate of potash, to remove free acids, and after separation the oily liquid is introduced into a clean retort and again slowly heated. The first portion coming over contains the amylic aldehyde. When the very slowly increased heat has risen to 96° C., the receiver is again changed and the distillate now collected as nitrite of amyl, until the thermometer reaches 100° C., when the distillation is stopped.

It will be observed that the process for the preparation of this compound consists of two distinct operations; first, the production of the amyl-nitrous ether, and, secondly, its purification. In both operations the *very gradual* application and increase of heat is very essential. The yield is small; not having kept any record of the yield, I am unable to give the percentage obtained. All the amylo-nitrous ether dispensed by me was made by this process.

After the publication of Redwood's process for spirit of nitrous ether,* it was repeatedly tried with entirely satisfactory results, and the idea naturally suggested itself to apply the same process to the similar compound amylo-nitrous ether. Accordingly, amylic alcohol was mixed with sulphuric acid, the mixture introduced into a retort together with some copper wire, and, after cooling, nitric acid was added. In a very few moments the evolution of gas was observed, the liquid became hot without the external application of heat, and the reaction very rapidly increased to such a violence that the entire charge was lost, it being impossible to condense any vapours in a Liebig's condenser, or to retain much of the liquid forced over, in the receiver. The experiment was never repeated.

Nadler† gives a process which he says readily yields the pure nitrite. It having come but lately under my notice, I am not prepared to speak about its merits; it consists in distilling amylo-sulphate of potash with nitrate of potash.

The composition of the nitrite of oxide of amyl is $C_{10}H_{11}O, NO_3$; it appears to me that we ought to discontinue this long name, as well as also nitrite of amyl. Amylo-nitrous ether expresses the chemical relations of this compound, and the similarity of names also indicates its analogy to the officinal ethylo-nitrous ether, which may well be continued to be called nitrous ether, just as ethylic alcohol and all its direct derivatives are called by their generic names merely—alcohol, aldehyde, ether—without any prefix.—*American Journal of Pharmacy.*

NEUTRAL CRYSTALLIZABLE PRINCIPLE IN BLACK SNAKE ROOT (CIMICIFUGA ACEMOSA).

BY T. ELLWOOD CONARD.

As this plant is a very common one, and has been fully described in articles heretofore written, I will not enter into any description of it, but merely state the condition of the root acted upon; and of the very many experiments made I will give those only which resulted most satisfactorily.

In order to get the advantage, if there should be any, in using the perfectly fresh root, I obtained it in this way directly from the ground. It was dug in the latter part of July, at which time the roots were quite well developed.

A portion of these, thoroughly cut and bruised, were put in a still with water, and a varied and continued heat was applied, but without producing in the distillate any preceptible amount of volatile principle. The addition of liquor potassæ to the mixture and redistillation was tried, which also failed to develope a volatile oil or other substance; there was no separation of anything from the water which distilled over, nor had it any taste or smell, except an earthy, rooty taste, characteristic of any inert vegetable matter. From these facts we infer the root does not owe its active properties to the possession of a volatile substance.

The next experiments I will give in outline. Three and a half pounds of the root, cut and bruised, were treated with four and a half pints of strong alcohol by maceration for four weeks and filtered. Two pints of this tincture was treated with three fluid ounces of the solution of subacetate of lead, which completely precipitated the resin, tannin, etc. and most of the colouring matter, as will be seen below. The lead was separated from the filtered liquid by means of sulphuretted hydrogen in excess; after agitating for some time together, filtered. A repetition of the process proved the solution to be entirely free from resinous or gummy substances, also from much colouring matter. The tincture was set aside and allowed to evaporate spontaneously. The resulting powder was treated repeatedly with benzine. The several washings were mixed and evaporated, yielding a minute portion of a disagreeable nauseous, fatty substance without colour. The *powder* was freed from the odour of benzine, placed on a filter and thoroughly washed with water; then dried and dissolved in sixteen times its weight of strong alcohol, forming a saturated solution. This was mixed with one hundred and twenty grains of pure alumina, moistened with a few drops of water, and agitated for twenty-four hours, then put in a capsule and evaporated spontaneously to a very dry light mass. This was put on a filter, and hot alcohol poured on it until entirely exhausted. This was allowed to evaporate, and there remained a crystalline substance of a light yellow colour, not of a very regular or decided shape, but of a massy appearance, resembling almost exactly the crystals of sulphate of alumina on a small scale. But under the microscope, at a low power, their crystalline form was more distinct, presenting an appearance similar to that of rock candy. This substance, in powder, has little taste, on account of its extreme insolubility in the liquids of the mouth. But its solution in alcohol has the intensely acrid and sharp taste that characterizes recent cimicifuga.

The crystals have the following characteristics:—They are very soluble in cold alcohol, more so when heated. Dissolve readily in dilute alcohol, also in chloroform, and slightly in ether; but are entirely insoluble in benzine, turpentine and bisulphide of carbon. Fusible at a moderate temperature, at a higher taking fire, and at a red heat entirely dissipated.

This substance, from the following experiments and their results, appears to be a neutral principle:—

A small quantity moistened on a jar lid with liquor potassæ, and approached with the stopper of a muriatic acid bottle, did not give off the characteristic white fumes of a volatile alkaloid, nor did it produce fumes when heated with liquor potassæ and brought near muriatic acid, as an ordinary alkaloid. A small quantity with liquor potassæ put in a tube with a small outlet, was gently heated, but no odour of ammonia was given off. Reddened litmus paper remains unchanged by continued contact with its solution. Entirely incompatible with

* See Amer. Journ. Pharm. 1867, p. 330.

† Ann. Chem. und Pharm. vol. cxvi. p. 176.

all acids, refusing to unite with them in any form or proportion. These few facts point very strongly to the conclusion that it is neither an alkaloid nor an acid principle, being entirely indifferent to the alkalies and not reddening litmus paper. The therapeutic properties of this substance have not been ascertained.—*American Journal of Pharmacy.*

THE USE OF LIQUID CAOUTCHOUC AS AN ADDITION TO EMP. BELLADONNÆ AND OTHER PLASTERS.

BY J. WILLITTS WORTHINGTON.

The author has treated this subject at some length in his inaugural essay before the Philadelphia College of Pharmacy, from which we abstract the following:—

Much difficulty has been experienced by pharmaceutists in preparing belladonna plaster so as to retain its adhesiveness when kept ready spread for some time. The proposed improvement consists in the addition of indiarubber used in the form of a solution, made as follows:—

Take of pure Caoutchouc, cut in small pieces, 1 oz.
Benzine (from Petroleum), 1 pint.

Macerate with occasional agitation in a suitable stopped, wide-mouthed bottle until a thick, saturated solution is obtained. To prove its efficacy in preserving the pliability of plasters, the author prepared a mixture of 3 ounces of Burgundy pitch, 4 drachms of yellow wax, 2 drachms of rosin and 2 drachms of lard; melted and strained. This, when spread and kept two months, became very brittle and cracked on handling.

The same ingredients, with the addition of 4 drachms of liquid caoutchouc incorporated when they were in a fused state, possessed the following characters:—

Very little tendency to crack, retains its pliability, is more adhesive, and has a beautiful smooth glossy appearance. After two months, part of it very cold weather, this plaster retained its pliability.

Experiments were then made with officinal belladonna plaster, which resulted in the following proportion being considered most suitable:—

Take of Belladonna Plaster (U.S.P.), 7 drms.
Liquid Gum Elastic, 1 drm.

The belladonna plaster to be melted by a water-bath, and the liquid rubber then added and stirred well until united thoroughly.

The odour of the benzine disappears when the solution is added in this way. It is quite important to avoid an excess of heat, and hence the water-bath is recommended.

Liquid rubber will be found to act admirably in all plasters which may be made to keep through the summer. —*American Journal of Pharmacy.*

CRYSTALLIZATION OF SULPHO-CARBOLATE OF QUINIA.

BY C. J. RADEMAKER, M.D.

Having had occasion to prepare sulpho-carbolate of quinia for hospital use in this city, the following process was resorted to:—

Crude sulpho-carbolic acid was saturated with plumbic carbonate, the sulpho-carbolate of lead crystallized and decomposed with sulphate of quinine. The solution of sulpho-carbolate of quinine filtered and evaporated, but it was found almost impossible to crystallize the salt, owing to the gelatinous condition of part of the solution, which adhered to the small amount of crystals formed. The gelatinous mass was redissolved in alcohol, and set aside to evaporate spontaneously, with the same result, it being found impossible to remove the crystals with any degree of nicety from the gelatinous mass.

I then made a solution of sulpho-carbolate of quinine of definite strength, a teaspoonful of the solution representing two grains of the crystallized salt, or as near two grains as I could calculate from the amount of substance used. The liquid was composed of three parts water and one part alcohol, and set aside for prescription use. In about four or five weeks I noticed small crystals forming, which gradually increased in size, the large crystals resembling those of perchloride of iron. Under the microscope they made a beautiful prismatic appearance, but to what system of prisms they belonged I was unable to determine. Part of the crystals were taken out of the bottle and examined and found to be sulphocarbolate of quinine.

In about two months about one-third of the salt had crystallized out of the solution. The salt was freely soluble in water, but slightly soluble in alcohol, and not deliquescent.—*American Journal of Pharmacy.*

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

*Part I.—On the Action of Hydrobromic Acid on Codeia.**

BY C. R. A. WRIGHT, D.SC.

It has been shown by the late Dr. A. Matthiessen, in conjunction with the writer,† that when codeia is heated with a large excess of strong hydrochloric acid the following reactions successively take place:—

$$\underset{\text{Codeia.}}{C_{18}H_{21}NO_3} + HCl = H_2O + \underset{\text{Chlorocodide.}}{C_{18}H_{20}ClNO_2}.$$

$$\underset{\text{Chlorocodide.}}{C_{18}H_{20}ClNO_2} = CH_3Cl + \underset{\text{Apomorphia.}}{C_{17}H_{17}NO_2}.$$

It appeared of interest to examine the action of hydrobromic acid under similar circumstances, and for this purpose Messrs. Macfarlane, of Edinburgh, with their wonted liberality, put a considerable quantity of pure codeia at the writer's disposal.

The aqueous hydrobromic acid employed was obtained by the action of H_2S on Br in presence of water, and subsequent rectification over pulverized KBr; it was free from SO_4H_2 and other sulphur compounds, had a sp. gr. of about 1·5, and contained about 48 per cent. of HBr.

When codeia is heated with from three to six times its weight of this acid, either on a water-bath or to gentle ebullition over a flame, the liquid, which at first produces no precipitate with solution of carbonate of soda, gradually darkens in colour, and acquires the property of yielding a dense white precipitate with this reagent. No appreciable quantity of methyl bromide is evolved during the first stages of this change, but, subsequently, this body is produced in some little quantity.

The precipitate thrown down by carbonate of soda before this further change ensues, appears to consist of a variable mixture of at least three substances, two of which are readily soluble in ether, while the third is but sparingly soluble in that menstruum; all are bases, the one insoluble in ether, and one of those soluble containing bromine: the one apparently first formed is produced by a reaction precisely analogous to that whereby chlorocodide is generated, viz.:—

$$\underset{\text{Codeia.}}{C_{18}H_{21}NO_3} + HBr = H_2O + \underset{\text{Bromocodide.}}{C_{18}H_{20}BrNO_2},$$

and is, therefore, termed bromocodide; this base appears to be acted on further with great ease, giving rise ultimately to the other two, the first of which has the constitution of codeia less one equivalent of oxygen, or $CH_{21}NO_2$, and is, therefore, provisionally named deoxycodeia; whilst the second has the composition of four molecules of codeia coalesced together, one of the 84 H atoms in the product being replaced by Br; it is, therefore, provisionally termed bromotetracodeia, the simplest

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* Extracted from the 'Proceedings of the Royal Society.'
† Proc. Roy. Soc. vols. xvii. p. 460; xviii. 83.

mode of representing the simultaneous formation of these two bases being as follows:—

$$\underset{\text{Bromocodide.}}{C_{18}H_{20}BrNO_2} + \underset{\text{Codeia.}}{4C_{18}H_{21}NO_3}$$
$$= \underset{\text{Deoxycodeia.}}{C_{18}H_{21}NO_2} + \underset{\text{Bromotetracodeia.}}{C_{72}H_{83}BrN_4O_{12}}.$$

Owing to the ease with which bromocodide is altered, it is a matter of some difficulty to obtain it in even an approximately pure condition, as the complete separation of deoxycodeia appears impracticable when this base has once been produced. The product of the action of three parts 48 per cent. acid on one part codeia on the water-bath for from one to two hours is precipitated by excess of sodium carbonate and the precipitate collected on filters; unaltered codeia is for the most part separated thus, being contained in the filtrate. Extraction of the mass with ether and agitation of the ethereal solution with HBr furnishes crude bromocodide hydrobromate, which may be purified by a repetition of the process, fractional precipitation being resorted to to get rid of traces of colouring-matters: the purified hydrobromate thus obtained was a viscid colourless liquid which utterly refused to crystallize, and dried up to a gum-like mass over SO_4H_2. Dried at 100°, the powdered gum gave these numbers:*—

0·3500 grm. gave 0·6340 CO_2 and 0·1580 H_2O.

0·230 grm. boiled with NO_3H and $AgNO_3$ gave 0·1900 AgBr.

	Calculated.		Found.	
C_{18}	216	48·76	49·40	
H_{21}	21	4·74	5·01	
Br_2	160	36·12	——	35·08
N	14	3·16		
O_2	32	7·22		
$C_{18}H_{20}BrNO_2HBr$	443	100·00		

The slight excess of carbon and deficiency in bromine thus found are doubtless due to the presence of a little deoxycodeia, the hydrobromate of which requires 59·34 per cent. carbon and 21·98 per cent. Br. Another specimen of bromocodide hydrobromate, prepared as above from the product of three hours' digestion at 100° of one part codeia and three parts 48 per cent. HBr, yielded numbers indicating 51·6 per cent. carbon, 5·3 and 33·4 per cent. Br.; whilst a repetition of the purification process scarcely altered the numbers. Owing to the great difficulty in preparing the pure salt in quantity, no attempt to isolate and analyse the base itself was made, the more so that the precipitate thrown down by carbonate of soda from the pure hydrobromate appeared to tally in every respect with the chlorocodide formerly examined; their qualitative reactions, too, are identical.

The crude bromocodide hydrobromate obtained after five or six hours' digestion of codeia with from three to five times its weight of 48 per cent. HBr deposited, on standing for some days, crystals not readily soluble in cold water; recrystallized several times from boiling water, minute snow-white crystals were ultimately obtained; these slightly darkened on drying over SO_4H_2, and more so at 100° and gave the following numbers on analysis:—

0·3565 grm. gave 0·7760 CO_2 and 0·1960 H_2O.

0·3245 grm. gave 0·7045 CO_2 and 0·1790 H_2O.

0·2200 grm. burnt with soda-lime gave 0·0570 Pt.

0·1380 grm. boiled with NO_3H and $AgNO_3$ gave 0·0700 AgBr.

These numbers agree with those calculated for deoxycodeia hydrobromate, as the following comparison shows:—

* All combustions given in this paper were made with lead chromate and finished in a stream of dry oxygen.

	Calculated.	
C_{18}	216	59·34
H_{22}	22	6·05
N	14	3·84
O	32	8·79
Br	80	21·98
$C_{18}H_{21}NO_2HBr$	364	100·00

Found.			
59·36	59·21		
6·11	6·13		
——	——	3·69	
——	——	——	21·59

The yield of this base from the codeia used being but small (about 4 per cent.), no attempt was made to isolate the base itself; carbonate of soda throws down from the hydrobromate solution a white precipitate which is soluble in alcohol, ether, benzol and chloroform; by exposure to air it rapidly becomes coloured, and finally acquires a very dark green tint. Its qualitative reactions are identical with those of apomorphia; the colour-reactions of the two with Fe_2Cl_6, NO_3H, and $SO_4H_2 + K_2Cr_2O_7$ being indistinguishable when examined side by side. Its physiological effects, however, are different; three-tenths of a grain of the hydrobromate administered by the mouth to a dog producing no appreciable effect, whilst a much less dose of apomorphia produces speedy vomiting.

(*To be continued.*)

Wasps and the Stamens and Pistils of Fuchsias.—The use of the petals of various flowers by bees is generally known, but it is not so well known that wasps remove the stamens and pistils of fuchsias for their own use. What this use may be appears somewhat uncertain, but the fact of their removal is chronicled by M. Ch. Morren, who states that, having frequently noticed that the stamens and pistils of certain fuchsias were removed by some unexplained means, he set a watch, and it was then ascertained that the wasps were the culprits. That they are employed by them for some purpose seems evident from the fact that the wasps were observed flying about the garden with the stamens in their mandibles. M. Morren believes that *Vespa nidulans* is the species which acts in this manner, as in localities where this wasp does not occur the flowers remained intact. It would be interesting to ascertain whether a similar phenomenon has been noticed in England.—*Gardeners' Chronicle.*

Turmeric.—The genus *Curcuma* is known as furnishing the yellow powder called turmeric, which is used as an aromatic ingredient in the preparation of curry-powder, and also in various branches of Eastern cookery as well as in medicine, and as a colouring matter and a test for alkalies. The young tubers, which are colourless, also yield a kind of arrowroot, that known as East Indian arrowroot being the produce entirely of species of this genus, such as *C. angustifolia*, Roxb., *C. rubescens*, Roxb., etc. In Borneo, *C. purpurascens*, Bl., is a common plant, and the older rhizomes are dug up, beaten to pieces, and washed to separate the farina from the fibre. The powder is not only used in the preparation of native dishes, but, mixed with water and perfumes, it is smeared over the faces and bare arms and necks of brides and bridegrooms when they sit in state before marriage, or receive their first visits of ceremony. Perhaps our perfumers may take a wrinkle.—*Gardeners' Chronicle.*

Annatto.—In an article in the *Milk Journal* a resemblance is pointed out as existing between annatto and those well-known coal-tar products,—the salts of rosolic acid; and a suggestion is made that it is worthy of investigation whether the rosolates might not be tried as substitutes for annatto.

The Pharmaceutical Journal.

SATURDAY, APRIL 29, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACY IN AUSTRIA.

AMONG the many political and social questions which are discussed in Austria just now, the relation of the pharmacist to the State is not forgotten. There, as in Germany, the pharmaceutical business is strictly under Government control; the number of pharmacies is limited, etc.

Some members of the profession at Vienna—for it is a profession there and not a trade—have lately petitioned their parliament, the Reichsrath, in favour of free trade, and they are strongly opposed by the Austrian United Society of Apothecaries, consisting of more than 500 members from different parts of the empire. They contradict point after point the arguments adduced by the free-traders in a long document, likewise addressed to the parliament.

As to the state of pharmacy generally, they say the Pharmacopœia is the Codex, prescribing what articles are to be kept, and of what quality. Professional inspectors ascertain by personal visits every year the efficiency of the pharmaceutical establishments, and their annual reports are most favourable.

In order to prove that the limitation of the business to a certain number is most conducive to the true interests of the public, they point to those countries in which free trade in pharmacy does exist.

It is stated as a matter of fact, that in all large towns in this country a few only of the many pharmacies enjoy public confidence. In London, it is asserted not more than 20 out of 3000 pharmacists' shops command undoubted confidence; but these 20 establishments are of such an extent as to employ 30 assistants each. The natural consequence is, that prescriptions are often sent many miles to the distant shop; and of what use, it is asked, are the undeserving 300 or 400 places on the way?

In regard to France, M. Dorvault, Director of the Pharmacie Centrale at Paris, is quoted, who said, "If the pharmacists are allowed to multiply without limitation, and to enter into competition as keen and bitter as in any other trade, a lamentable falling off in these establishments must be the consequence, and many pharmacists will be forced to adopt means they themselves despise to gain a decent living."

Next, the fixed charges in dispensing, regulated by the State, are discussed, and the question is ventilated which system is most advantageous to the public. It appears the principle followed in the scale of prices is as follows:—Drugs, if sold in comparatively large quantities, are charged the wholesale price, with an addition of 25 per cent., and in small quantities with an addition of 50 per cent. Another charge is made for work, bottles, etc., so that the price of a medicine includes four or five items.

To compare the charges in Austria with those made in England and France, the prices as agreed upon by the Manchester pharmacists, and copied in full from this Journal of 17th December last, are given, and also a copy of a tariff from M. Dorvault's work, 'L'Officine.' The result of this comparison is, that the prices are in the proportion of Austria 1, France 2, England 3, or the French charges for medicines are twice as high, the English three times as high as the Austrian.

The explanation for this great difference the petitioners find in the fact that, after all, the dispensing business is fixed within certain limits, and that the number of pharmacies in France and England so vastly exceeds the real demand, that each can get only a small share, and tries to make up by higher prices. But even these high prices are not sufficient to ensure the existence of so many participators, and they are driven to sell all sorts of patent and proprietary articles. On this subject the Austrians wax very warm indeed. They quote words of the celebrated Professor Boudet, spoken at the Pharmaceutical Congress at Paris in 1867:—"You high and mighty patrons of specialism, do not barricade yourselves behind sophisms, which mislead nobody. You have made slaves of your colleagues; you have degraded them to retailers of your patent medicines; you have deprived them of their self-confidence and of their professional honour; you have sacrificed the good-fellowship of your brethren to your egotistical designs, and you speculate only on the weakness and ignorance of the sick, on the suffering of life, and every one becomes without compassion a victim of your guile. Oh! if your principles were realized; if in the civilized world pharmacy were handed over to freedom as you demand, what a flood of specialities! what international rivalry of miraculous remedies would rush down upon us! how the diploma of pharmacy would be degraded! Yes, I do not shrink from saying so; and if that diploma might be had for the trouble of picking it up, where is the man of honour to be found who would stoop to drag it out of the mire into which it has fallen? And as to the millions you realize by your specialities, keep them for yourselves; I value the honour of my country higher!"

The gist of the petition is embodied in three points, viz.:—

1. The principle of free trade is not applicable to the pharmaceutical business.

2. Free trade in pharmacy is antagonistic to the true interests of the public, and must ruin the profession, hitherto so highly esteemed.

3. The present system of licences is the best both for the public and for the proprietors of pharmacies.

And, finally, the petition complains that the Government has removed the two apothecaries from the sanitary council of the empire at a time when in Russia two members of the Pharmaceutical Society of St. Petersburg have been appointed members of the supreme sanitary council, in order to report on all points connected with their profession.

DISPENSING CHARGES.

The question of securing a uniform rate of charges by chemists and druggists has been already debated in our columns.* The Manchester Chemists and Druggists' Association gave the discussion a practical turn by agreeing upon a list of dispensing charges, which they recommended for adoption by the trade generally.† This proceeding has now been followed by the issue of a list of retail prices and dispensing charges, recommended by the Bath Chemists and Druggists' Association. We have been favoured with a copy of this list, to which the following preface is attached:—

"At a meeting of the Association, held February 3rd, a Committee was appointed to draw up a price list with a view to promote uniformity amongst pharmaceutists in our own city, and partly also with the hope that other towns, in the West especially, will also issue and exchange lists to the same end.

"It will be seen that the prices obtained in Bath agree very nearly with the Manchester list, and on comparing them with those of other towns, so far as it has been possible to do so, it has been found that they represent a fair average.

"As a matter of course, prices will always vary in different towns, and in different parts of the same town; but still much may be done to remove the reproach that pharmaceutists are now liable to, that the same prescription dispensed at respectable establishments in various parts of the kingdom is rarely charged for twice alike.

"Our Bath brethren are urged to abide as much as possible, especially in dispensing, by this list, the prices of which are certainly far from excessive. Cheapen physic as we will, the public will never swallow an extra dose of it, and since we must live, cutting prices simply mean inferior drugs. It is as much therefore for the interest of the medical profession and the public generally as for ours that we should be properly remunerated.

"Even if ours were a mere trade, which it is not, our incomes are ridiculously small as compared with those of our neighbours who are grocers, drapers, wine merchants, etc., and this, too, in spite of the educational demands now very properly made upon us, and notwithstanding our long hours of responsible and hard work during the *seven* days of the week.

"It is requested that all prescriptions be marked under the stamp of the first dispenser."

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* *Ante*, p. 549. † See p. 499.

YOUNG'S PATENT POISON CABINET.

Those of our readers who were able to visit the Exhibition of Objects relating to Pharmacy, held at Liverpool in connection with the last meeting of the British Pharmaceutical Conference, may perhaps remember seeing a model of a poison cabinet, exhibited by Mr. J. C. Young, of Warrington. A practical application of this plan, with some modification in the details, is now being submitted to the trade by its inventor, which, it is claimed, will render difficult the occurrence of mistakes in dispensing. It consists of a certain number of shelves, according to the space allotted to it, and the quantity and size of the bottles to be accommodated. Each bottle is labelled, and has its proper place in the cabinet, into which place it is securely fastened. On the front edge of the shelf are painted names corresponding with the labels on the bottles which are supported by it. But these names are—with one exception, for the sake of variety—not immediately beneath the bottles to which they relate. Under each shelf is a movable indicator. When a certain bottle is required, the indicator is pushed along until it rests directly below the name painted on the front of the shelf, when it will be found that that particular bottle is released, but no other. Thus, should the strychnia be required, the name has first to be found and the indicator brought under it, and then the bottle itself, which may be five or six or more spaces off. This operation, although occupying a very short time, necessitates the reading of the name twice; and should an error be made either time, the bottle cannot be taken out.

By another provision any mistake from putting one bottle into the place of another is prevented. Not only is it necessary for the indicator to be in its proper place before a bottle can be replaced, but should two bottles be out at one time and the wrong one be taken up, it is not possible to put it into the wrong space, as each bottle is made to fit its own place and no other.

One great advantage of such an arrangement as this is that it requires the intelligent reading of the label twice, and thus the dispenser's attention is called to the nature of the substance which he is about to use. One objection to all previous mechanical contrivances for the same purpose has been their tendency to lead dispensers to trust in them entirely instead of using them as aids; transferring, as Mr. Squire pithily puts it, a man's brains from his head to his fingers. Mr. Young's invention, however, is hardly open to this objection, as by a simple mechanism, not likely to get out of order, it prevents any poison-bottle being taken out of the cabinet without the dispenser being well aware of what he is doing. At a time when there is so much discussion upon the subject as at present, and when pharmacists are generally desirous of adopting any additional methods for securing safety from accidents, we think this Patent Poison Cabinet worthy of their consideration.

POOR-LAW TENDERS FOR MEDICINES IN IRELAND.

The following list of prices, showing the anomalies which may exist under the present system of tenders for the supply of medicines to unions in Ireland, is published in the *British Medical Journal* as representing the prices quoted in tenders to the North and South Dublin Unions

	North.			South.		
	s.	*d.*		*s.*	*d.*	
Acidum aceticum fortius	26	8	per gall.	3	6	per gall.
Acidum sulph. aromat.	2	0	per lb.	28	0	per lb.
Aloes hepatica	0	4	,,	6	6	,,
Aloes Socotrina	1	9	,,	6	6	,,
Pilula aloes composita	4	0	,,	10	0	,,
Pilula colocynth. comp.	6	0	,,	2	6	,,
Pilula hydrargyri	1	0	,,	4	6	,,
Pilula rhei composita	6	0	,,	1	0	,,
Pulvis scammonii	28	0	,,	10	0	,,
Potassii bromidum	6	6	,,	20	0	,,
Iodum	16	0	,,	44	0	,,
Pulvis ipecacuanhæ	10	0	,,	5	6	,,
Extractum belladonnæ	4	0	,,	16	0	,,
Extractum hyoscyami	1	6	,,	5	4	,,
Pulvis opii	50	0	,,	22	0	,,
Sulphas magnesiæ	9	4	per cwt.	6	0	per cwt.
Sulphur sublimatum	4	8	per stone	1	6	per st.

If the opposition to Mr. Lowe's match tax had not caused its withdrawal, it would have been possible to urge a new argument to overcome his reluctance to entertain any application for grants in aid of science. It might then have been said that the application of science to industrial arts afforded the Chancellor of the Exchequer a means of obtaining additions to the revenue, and that consequently, from his point of view, promotion of science was a thing to be desired as a financial expedient.

An interesting plant is figured in the present number of the *Botanical Magazine* under the name of *Chlorocodon Whitei*, H.f. It is a climbing, leafy plant, sometimes reaching to the tops of the most lofty trees, and sending its roots out among the surrounding rocks and stones to a distance of fifteen to twenty feet. It is a native of Natal, but is never found more than a few miles from the sea. The roots, under the name of "Mundi roots," are extensively collected and sold by the Kaffirs, who eat large quantities of them, chewing them for their agreeable aromatic taste and stomachic properties. The consumption has been so great in the district where the plant was discovered that it has become rare. It is said that the roots have a sweeter and better flavour the nearer they are grown to the sea. Some of the living roots have been received at Kew, from which plants have been raised and they flowered last autumn. The fresh roots have a powerful odour, somewhat resembling that of the Tonquin bean.

At the Annual General Meeting of the proprietors of the London Institution, held on Wednesday last, Mr. Daniel Hanbury, F.R.S., was elected a Manager, in the room of Mr. S. J. Fletcher, resigned.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

April 19th, 1871.

Present—Messrs. Ainslie, Aitken, Baildon, Brown, Buchanan, Kemp, Young and Mackay.

Twenty-two Candidates presented themselves; eight for the First or Preliminary Examination, eight for the Minor, one for the Major and five for the Modified. The following fifteen passed, and were declared to be duly qualified to be registered:—

FIRST, or PRELIMINARY (as Apprentices or Students).

	Cairns, Thomas	Edinburgh.
	Hinksman, John	Edinburgh.
	Swan, Peter	Edinburgh.
	Weddell, George	Kelso.
Equal.	Brown, Allan	Glasgow.
Equal.	Ferguson, William James	Gorebridge.
Equal.	Macmillan, James Laker	Glasgow.

MINOR (as Chemists and Druggists).

*Mackay, George Duncan	Edinburgh.
Coldwell, Peter	Edinburgh.
Lunan, Alexander	Aberdeen.
Hardie, Alexander	Edinburgh.

The above names are arranged in order of merit.

MAJOR (as a Pharmaceutical Chemist).

*Linton, Ralph Tait .... Edinburgh.

MODIFIED (as Chemists and Druggists).

Lockerbie, James	Helensburgh.
Midgley, Charles	Manchester.
Ritchie, Andrew Wemyss	Alford, Aberdeen.

Errata.—Page 851, col. 1, line 5 from bottom, *for* Hensley, Robert Place, *read* Hensby, Robert Place; page 851, col. 2, line 51, *for* Nash, William, *read* Neish, William.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eleventh General Meeting of this Association was held at the Royal Institution on Thursday evening, the 13th instant; the President, Mr. John Abraham, in the chair.

Mr. Alfred E. Tanner asked the opinion of the members upon the incompatibility of persalts of iron with infusion of chirata. A mixture of inf. chiratæ with liq. ferri pernit. had been returned to him by a physician because it was dark coloured and slight decomposition had taken place.

Mr. S. G. Hilditch said that if the infusion was prepared in accordance with the Pharmacopœia, persalts of iron were incompatible with it, and the mixture would be a dark brown colour; but if the infusion was prepared with cold water, the mixture would not be effected. The intensity of colour would vary according to the temperature of the water used to make the infusion, hot water taking up much more gallic acid than cold water; he noticed that the characteristic inky taste was not present, but this might be covered by the intense bitter of the chirata.

Mr. Charles Symes, Pharmaceutical Chemist, thought the process given in the Pharmacopœia for making linimentum hydrargyri was unnecessarily tedious, melting

* Passed with Honours.

the mercurial ointment being quite undesirable; taking the quantities given in the Pharmacopœia, he agitated the ammonia with one-half the camphorated oil; rubbed the mercurial ointment with the other half, and mixed the two results together. A few minutes sufficed for the operation, heat was not used, and the product was quite satisfactory.

Mr. James Blair concluded his paper upon "The Chemistry of Calico Printing."

The paper was illustrated with photographs, charts, specimens of materials dyed and printed, and by experiments showing the effects of some of the processes employed.

[We purpose printing this paper in a future number.]

At the conclusion of the paper, Mr. Blair replied to several questions asked by those present, and after a short discussion, the President congratulated Mr. Blair upon the copious and strictly scientific manner in which he had treated his subject, and moved a vote of thanks, which was carried unanimously.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Anderson's University.

The Fourteenth and concluding Meeting of the Session, Wednesday, April 19th, 1871; Mr. Thomas Davison, President, in the chair.

A paper was read by Mr. J. L. Macmillan on "Volatile Oils," in course of which he called attention to the difficulty in testing these, and their liability to adulteration, stating that turpentine, from its resemblance in chemical composition to most volatile oils, was frequently used. He then referred to the specific gravity and blotting-paper tests, stating that while the latter answered for fixed oils, they were both unreliable tests in some cases, and suggested to the Council that a prize offered for a reliable test might bring out some satisfactory result.

Mr. Kinninmont remarked that the adulteration of volatile oils was one which deserved attention, and he would recommend Mr. Macmillan to proceed in his investigations. He said he had lately come across a sample of ol. lavand. which was adulterated with castor oil, and from its solubility in alcohol it was with much difficulty detected.

Some remarks were afterwards made by Messrs. Paterson and Fairlie, and, on the motion of the President, a unanimous vote of thanks was passed to Mr. Macmillan for his paper.

The report of the Early Closing Committee was then submitted, and being considered favourable, the Committee was instructed to take further action as soon as possible.

Mr. Fairlie, Hon. Secretary, afterwards stated the arrangements that had been entered into with the "Popular Class Committee" of Anderson's University, for the conducting of a botany class for students in pharmacy; about thirty names were given in, and Professor Hennedy had arranged to begin on Wednesday evening, April 26th.

The President, Mr. Davison, then delivered his Valedictory Address, in course of which he congratulated the members on the importance of the position their Society had now attained. In referring to the early history of the Society, he said it was instituted in 1854 as an Early Closing Association, and, at the end of three years, having partially attained its object, it was reorganized into a Mutual Improvement Society. For many years their only place of meeting was in a temperance hotel, but latterly, through the kindness of Dr. Moffat, they were permitted to meet in his laboratory, till last year, when the Council thought it desirable that some change should be made, both for the good of the Society and the trade. Negotiations were entered into with two of the scientific institutions of the city, the result being, that they were now located within the walls of a University. They had still much to undertake, yet, however, before they could take the position they ought, he therefore counselled the members to greater diligence and perseverance in their studies.

Mr. Kinninmont, in proposing a vote of thanks to Mr. Davison for his services as President, remarked that he thought he (Mr. Kinninmont) was the only member present who had attended the first meeting on the early closing movement in 1854, and on looking back over the years that had intervened, he thought they had much to congratulate themselves on in the advance that had been made. Those present could have no conception of the struggles of these early years. He thought they had been exceedingly fortunate this session in the choice of President and Secretary, and to his mind the amount of work they had gone through was extraordinary. He trusted that the same energy would characterize all the members, that at no distant date we might see a school of pharmacy established in this important district. He had much pleasure in proposing a hearty vote of thanks to the President and Secretary, which was responded to with acclamation.

Messrs. Davison and Fairlie briefly replied, acknowledging the compliment paid them.

The Secretary then called attention to the 'Register' of Chemists and Druggists, which had been presented to the Association by the Council of the Pharmaceutical Society.

The President, in moving the thanks of the Association to the Council for their donation, stated that Mr. Joseph Ince was engaged in preparing a book of autograph prescriptions for Glasgow, and that it was expected to be ready in May, when any member would have an opportunity of examining the collection.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

April 20th.—Professor Odling, F.R.S., Vice-President, in the chair.

The following gentlemen were elected Fellows: C. C. Grundy, S. B. Lee, G. Sutcliffe, W. Ward.

Mr. C. Haughton Gill read a paper "On some Saline Compounds of Cane Sugar." Peligot has described a compound of cane-sugar and salt, to which he ascribed a formula of $C_{24}H_{42}O_{21}NaCl$ ($C=6\ H=\cdot5\ O=8$), which requires 14·92 per cent. of sodic chloride:—this indicates the replacement of 9 parts of water by 58·5 parts of sodic chloride. Bondeau de Carrolles subsequently examined a similar compound to which he ascribed the formula $C_{24}H_{20}O_{20}$, $NaCl, 3HO$, which includes water of crystallization of which Peligot makes no mention. Subsequently Mitscherlich denied the existence of the body, and Hochstetter mentioned that other chemists had failed to obtain it. Mr. Gill, being at first unsuccessful in preparing Peligot's compound by the method described, boiled a solution of sugar with an excess of salt for some time, filtered, and set aside the apparently uncrystallizable syrup. At the end of some months a few small, not very transparent, but individually distinct crystals, had formed. They were drained, rinsed, pressed and analysed. The numbers lead to the formula $2(C_{12}H_{22}O_{11})$, $3NaCl$, $4H_2O$. This compound of an unexpected composition having been obtained, a number of solutions of sugar, with various proportions of different salts, were made up and set aside to crystallize. The salts employed were the chlorides of potassium, sodium, lithium and ammonium, the bromides of potassium and sodium, and the iodides of potassium, sodium, lithium and ammonium. In each case four solutions were prepared, having one, two, three and four molecules of the salt to the double molecule of sugar, $2(C_{12}H_{22}O_{11})$. None of the potassium salts gave compounds of a definite composition. The mixture containing the chloride in the smallest proportion gave crystals of pure sugar, those containing the two largest proportions gave a crop of the pure potassic chloride.

The solutions containing potassic bromide behaved in a very similar manner, giving crystals often very clear and sharp, and sometimes five or six m.m. in extreme dimensions, but always *anhydrous* and of irregular composition. The solutions containing potassic iodide evaporated to very thick sticky masses, sometimes containing a number of minute crystals which could not be separated from the mother-liquor.

The sodium salts gave more definite results. In the case of the chloride, the solution containing least salt first gave crystals of pure sugar, and then on further concentration deposited crystals, which are doubtless the same as those of the compound examined by Peligot, and are identical with those obtained from the liquid containing the next higher proportion of salt, viz. $NaCl$ to $C_{12}H_{22}O_{11}$. This compound crystallizes in prisms terminated by pyramids, is very soluble in water, less so in spirit. When to its solution in spirit of not more than 75 per cent. ether is added, an oily layer is formed at the bottom of the vessel, and in this crystals form, which have the composition $C_{12}H_{22}O_{11}$, $NaCl$, $2H_2O$.

The solutions containing sodic bromide can hardly be made to crystallize at all. A small quantity of minute confused crystals were deposited after some months from the solution containing $3NaBr$ to $2C_{12}H_{22}O_{11}$; these when pressed and dried over oil of vitriol gave numbers which would point to a formula, $NaBrC_{12}H_{22}O_{11}\,1\frac{1}{2}H_2O$, but it is more probable that when pure it is similar in composition to the analogous compound of sodic chloride.

The solutions containing sodic iodide give crystals of definite and constant composition with remarkable ease. These crystals always have the same composition, whatever the proportions of the constituents in the mixture, unless one be in such large excess that it can in part crystallize out before the liquid becomes saturated with the compound. The solutions containing a moderate excess of sodic iodide yield the best crystals and quickest growth. It can be recrystallized as often as desired from water or dilute spirit without suffering decomposition, forming large transparent crystals even from small quantities of solution. Their constitution is expressed by the formula $2(C_{12}H_{22}O_{11})$, $3NaI$, $3H_2O$. None of the mixtures containing lithium gave any crystals other than those of sugar.

The mixtures containing ammonic salts gave no definite compounds.

No results were obtained from the solutions containing ammonic iodide.

The crystals of sugar containing ammonic chloride, and the equally distinct, though generally smaller ones, containing potassic bromide, and those deposited from a hot alcoholic solution of the lower salt-compound, must be built up by an *anhydrous* compound of the salt and sugar, isomorphous with sugar itself, crystallizing out together with an excess of the latter.

That the crystals are not simply sugar with adhering ammonic chloride is shown by their individual perfection, and by the fact that they are deliquescent, whereas neither constituent is so.

The solutions of all the bodies described in this paper, especially that of the lower salt compound, exhibit persistent supersaturation in a remarkable degree. A saturated warm solution, when cooled and shut up in an airtight vessel with several crystals of the solid body, continues to deposit more of the compound for several months.

The composition of the sodic iodide compound makes it seem probable that the true molecular weight of cane-sugar should be represented by $C_{24}H_{44}O_{22}$.

The measurements of the various crystals mentioned in Mr. Gill's paper were kindly executed by Professor W. H. Miller.

BRITISH MEDICAL ASSOCIATION.—METROPOLITAN COUNTIES BRANCH.

At the Ordinary Meeting of the above Branch, held at the Charing Cross Hotel on Friday, April 21st, Dr. E. C. Seaton opened a discussion on 'Some of the Lessons to be derived from the present Epidemic of Smallpox.'

Dr. Seaton, after alluding to the severity of the present epidemic, proceeded to give statistical details which had been compiled, and which, he argued, proved very strongly the great value of vaccination for the prevention and mitigation of the virulence of smallpox. Thus, in the cases which had occurred in London there had been forty-five per cent. of deaths among the unvaccinated, whilst among the vaccinated they only amounted to nine per cent. A rule had been adopted in the metropolitan smallpox hospitals that all persons engaged in those establishments should be revaccinated before entering upon their work. The result had been that, with three exceptions, they had hitherto escaped infection. These three exceptions proved the rule, for it was found upon inquiry that in each case, for one reason or another, the regulation had not been carried out. He mentioned that while on a visit to Rotterdam, he had been surprised to notice the small proportion of infants brought for vaccination compared with the proportion in this country. Upon inquiry he found that throughout Holland vaccination was frequently deferred until the children were five or six years of age, the consequence being a death-rate from smallpox far in excess of that of this country. He thought one lesson to be learned from this epidemic was the necessity of the compulsory registration of all births. Next that the compulsory provisions of the Vaccination Act should be thoroughly carried out. At the same time, while it was proper to compel people to do that which was right in the matter, they ought also to be shown that it was their duty. Much might be done in this way by members of the profession taking the trouble to explain and refute the groundless objections that were brought against vaccination. He had found in several towns and rural districts that by means of a little persuasion, it had been possible to carry out the provisions of the Act without an appeal to the law. In conclusion he said that, in his opinion, vaccination successfully performed once in infancy and again at the age of puberty, was a most valuable safeguard against the smallpox.

Dr. Steele, of Liverpool, furnished some information concerning the epidemic in that town. The death-rate there had been twelve per cent. among vaccinated cases and sixty per cent. among unvaccinated. In Liverpool there had been but one case of smallpox among the large number of persons employed at the hospitals, and that had been in a person who had been exempted from the rule of revaccination.

Mr. Liddle, Medical Officer of Whitechapel, said that medical officers were greatly cramped in their action by the amount of "red tape" they had to contend with, and mentioned an instance where a person who had been sent from Whitechapel to the Homerton Asylum was sent back again because a printed form was not filled in which had not been previously supplied.

Dr. Lankester considered that the fact that after so long a time the disease was still in our midst was a disgrace to the country. If it had been a cattle disease, and oxen or sheep had been the victims, we should have stamped it out long ago. He advocated the compulsory registration of all births. Then he would appoint inspectors in every parish who should have the power to go into every house and see that vaccination was strictly attended to. He considered also that medical men should immediately inform the medical officer of health of cases of smallpox, in order that he might take the necessary steps to prevent its spread. They ought not, as in many cases, to assist in keeping its existence secret, for fear of loss of custom to their patients, thus allowing them to become *foci* of contagion. Proper means for disinfecting bedding, clothing, etc., should also be provided in sufficient quantity. He had himself met with a poor man who complained that the stench of smallpox in his house was so great that he had not been able to sleep for several nights. In the parish of St. James's, Westminster, he had tried gas apparatus, but it was not sufficiently effective. He had now an oven in which the infected material was placed and the heat raised to 250°; this was found to be effectual for disinfecting beds, etc., without pulling them to pieces. He considered these measures should be carried out universally by some higher authority and not left to the action of individual vestries. In the parish of St. James's he had ascertained that in a population of 40,000 there was an annual emigration of 2000, replaced by an immigration of a like number; and unless similar measures had been carried out in the parishes from whence these persons came, they rendered useless a great deal that had been done. As coroner he had held inquests in cases where unvaccinated children had died from smallpox, and although that had been looked upon by some persons as rather a sharp proceeding, he believed it had been of service by bringing home to the parents the effects of their negligence.

An animated conversation followed, in which more than one speaker expressed a doubt as to the utility of revaccination, one gentleman saying that it was no more possible for a person who had been properly vaccinated once to be successfully revaccinated, than for him to have the measles or hooping-cough a second time.

In reply, Dr. Seaton said that he thought results had proved the efficacy of revaccination. At the same time vaccination in the adult is a much more serious affair than in the infant, and he looked with disfavour upon a great deal of the revaccination which had been so fashionable lately at the West-End. He thought that, as a rule, the operation performed once in infancy and once in adolescence was sufficient, except in cases where the constitution might be supposed to have undergone a great change, as after eruptive fevers, etc.

MEETINGS FOR THE ENSUING WEEK.

Monday, May 1. ......*Medical Society*, at 8 P.M.—Annual Oration.
Royal Institution, at 2 P.M.—Annual Meeting.
London Institution, at 4 P.M.—"On Astronomy" (Educational Course). By R. A. Proctor, F.R.A.S.

Tuesday, May 2. ......*Royal Institution*, at 3 P.M.—"On the Geology of Devonshire, especially of the New Red Sandstone." By W. Pengelly, F.R.S.

Wednesday, May 3. ...*Society of Arts*, at 8 P.M.—"The Production of Artificial Cold." By Professor John Gamgee.

Thursday, May 4. ......*Royal Society*, at 8.30 P.M.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.—"The Productive Powers of Soils in Relation to the Loss of Plant Food by Drainage." By Dr. Voelcker, F.R.S.
London Institution, at 7.30 P.M.—"Economic Botany." By Professor Bentley.

Friday ....*Royal Institution*, at 8 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCY.

The Justices of the County of Worcester propose, at their Midsummer Sessions, to appoint an Analyst of articles of Food and Drink purchased within the said county. For particulars, apply to Mr. W. N. Marcy, Clerk of the Peace, at his office in Worcester.

Parliamentary and Law Proceedings.

Suicide by Carbolic Acid.

Messrs. W. E. Jeffreys, M.R.C.S., and J. Hainworth, F.R.C.S., report in the *Medical Times and Gazette* a death from poisoning by carbolic acid, which occurred on the 1st inst. The deceased, who had been discharged recently from Bethlem Hospital, was found by his housekeeper on his bed, insensible and "snorting." There was a strong smell of carbolic acid in the room, and a bottle containing some, which had been kept in the kitchen for cleansing purposes, was found on the drawers. Medical assistance was promptly obtained, but death followed in about fifty minutes after the supposed time of his taking the poison. The housekeeper estimated the quantity taken as between one and two tablespoonfuls.

At the *post-mortem* examination all the parts over which the acid had flowed were found whitened and hardened by the superficial cauterization of the epidermis and epithelium, while a longer contact, as in the stomach, had caused a corrugation of the epithelium and the breaking of it up into small particles. Upon the application of the B. P. test to the contents of the stomach, the characteristic reaction of carbolic acid was observed.

Collision at the Stepney Station.

By a collision which took place at the Stepney Junction of the Blackwall Railway, on Sunday afternoon, April 9th, a carriage belonging to a Blackwall train was driven by the engine of a Bow train partly over the railings and brickwork, so that it was only prevented by the couplings from falling into an engineer's yard. The only passenger in the carriage was Mr. George Hunter, son of Mr. J. Hunter, Pharmaceutical Chemist, of High Street, Gosport. He was bruised and very much shaken, and has received a severe shock to his system, but is now progressing favourably.

Poisoning by a Salt of Copper.

A singular instance of poisoning by copper was investigated on Thursday by Mr. Price, coroner for Salford Hundred, at Audenshaw. The inquest was held on the body of a young married woman, named Sarah Rogers, twenty-four years of age, who died at Hooley Hill, on the 24th ult., under circumstances that led the police to arrest her husband on a charge of administering poison. The inquiry had been adjourned for the purpose of an analysis of the contents of the stomach of the deceased. Dr. Calvert stated that he was induced to search for an irritant poison. He looked in vain for traces of oxalic acid, arsenic, baryta, antimony, lead, bismuth, tin, mercury, and at last tested for copper, though he thought this substance was less likely to be found. Never during an experience of thirty years had he found such difficulty in detecting the presence of the poison for which he was in search, owing to the stomach and intestines being emptied by excessive vomiting and purging. After much careful examination, he found a very small quantity of copper in the stomach, a larger quantity in the intestines, and portions in the liver. Bearing in mind the statement made by one of the witnesses that deceased had been purged, and had vomited for some days (seventy-two hours altogether), that only a small quantity of a salt of copper was required to produce death, and that it was easily removed from the body by vomiting and purging, he was not surprised that only a small quantity was found. He was of opinion that the inflammation was produced by the toxic action of a salt of copper. Although some toxicologists entertained a belief that in certain instances copper was a natural element of the body, he was of opinion that in this case the quantity found was too large to admit of its existence under such circumstances. There were cases on record of persons having been poisoned by partaking of food cooked in utensils lined with copper; and it was well known that others had died from eating sweetmeats, jams and *sauerkraut* made in culinary utensils of the same material. Taylor, in his work on poison, mentioned the case of some seamen poisoned by eating fatty matter cooked in a copper vessel. There were many other instances of persons partaking of copper sufficient to produce death without its being administered as a poison. Cases of intentional poisoning by copper were exceedingly rare, owing to its easy detection from the powerful metallic taste it produced. There was one exception, however, a substance used by painters,—verditer,—which had no taste. Something like a drachm would, in his opinion, cause death. In reply to various questions, it was stated that no copper vessels were used in the house of deceased, or at the hat manufactory where she and her husband were employed. Professor Calvert added that the contents of a bottle of which deceased had partaken contained no traces of copper. The jury returned a verdict to the effect "That deceased died from the effects of poisoning, but how, when, or by what means taken or administered there was no evidence to show."

Death from Bichloride of Methylene.

An inquest was held on Friday last, at Charing Cross Hospital, to inquire into the circumstances attending the death of David Skelton, a labourer, who died while under the influence of bichloride of methylene, for the purpose of an operation.

Mr. Ewin Canton, surgeon to the Charing Cross Hospital, stated that the deceased attended the hospital for treatment of an injury to one of his fingers, which he had received while killing a pig, the tusks of the animal having severely lacerated it. Mr. Canton advised amputation of the finger, to which deceased assented, and expressed a wish to have it done under the influence of chloroform. On the previous Tuesday the operation was performed, he having previously inhaled $1\frac{1}{2}$ drachms of bichloride of methylene. This was administered by the regular administrator of the hospital, and was not more than half the quantity usually given. The deceased having become insensible, the finger was removed, the operation not lasting more than one minute, when it was noticed that his head had fallen on one side, his eyes were upturned, and breathing and pulsation had ceased. Every effort was made to restore animation, but without success. Upon a *post-mortem* examination he had found all the organs in a perfect state of health; the heart and brain, the organs usually affected when chloroform is administered, not presenting any traces of the action of the methylene. The only way in which he could account for the death was by supposing that the man being in a state of great nervous excitement at having to undergo the operation, the methylene had acted upon the nervous system, causing instant death. He had known death to occur under an operation from excitement, without the administration of an anæsthetic. There was no doubt that in the case under inquiry death had resulted from the use of the bichloride of methylene. Cases of death while under the influence of this agent were very rare, but he never allowed it to be administered except with the patient's full consent.

The jury returned a verdict "That the deceased died from the effects of methylene properly administered during an operation."

HOUSE OF COMMONS.

The Proposed Tax on Matches.—*April* 20.—In making the annual financial statement, the Chancellor of the Exchequer announced an estimated deficiency amounting to £2,713,000, for which it would be necessary to provide. In order that this might be done, he proposed, amongst other things, to impose a tax upon matches, an idea that he confessed to having borrowed from American finance. He spoke of matches as being one of the most splendid boons which science has given to man, to enable him to dispense with the flint and steel. He proposed to put a halfpenny stamp upon every box of matches containing not more than a hundred, and a penny stamp on a box containing not more than one hundred wax lights or fusees. He said that 560,000,000 boxes of matches and 45,000,000 of wax lights and fusees were made in this country annually. The revenue estimated from this source was £550,000. Having noticed that the device of an ark on some boxes was a very odd and inappropriate one,—suggestive of a watery idea,—he proposed to adopt as a motto for the stamp the words *Ex luce lucellum.**

Dr. Playfair, in supporting the proposition of the Chancellor of the Exchequer, said that, although when he was examined before the Committee of 1867 as to the propriety of levying a tax on matches, he was not able to see how it could be done, he had given the subject his consideration occasionally since, and had come to the conclusion that it might be done. Nearly $1\frac{1}{2}$ per cent. of the fires arose from the careless use of matches. The careless use of matches had led to carelessness in their manufacture. He believed the proposed tax would give an impulse to the manufacture of safety matches. A competition in the manufacture of improved quality would have a good effect on the workers; it would tend largely to remove that horrid disease,—the worst that medical men had to deal with,—disease of the jawbone.

April 25.—Mr. Disraeli having given notice of his intention to move that the financial proposals of the Government were unsatisfactory to the House, the Chancellor of the Exchequer announced that, in view of the disfavour with which the match tax had been received in many quarters of the House, the Government had decided to withdraw it.

Review.

Handbuch der Pharmacognosie und Pharmacologie für Aerzte, Studirende der Medicin und Pharmacie, Apotheker und Droguisten. By Prof. Dr. Archimedes von Schwartzkopff, Teacher of Pharmacognosy, National Economy and Commercial Science at the University of Basle, and Teacher of the Germano-Swiss Commercial School. Part I. Leipsic and Heidelberg: C. F. Wintersche Verlagshandlung. 1871.

It is almost impossible to imagine a more difficult task than to write a book on pharmacognosy and pharmacology which would meet all just demands of the day, for the simple reason that it must embody all the information which the student of medicine or pharmacy, the medical man and the pharmacist may require in order to ascertain the physical and chemical properties of their remedies, distinguishing marks of purity and adulteration, of their physiological actions and therapeutical applications.

The writer or compiler of such book must have an intimate acquaintance not only with chemistry, natural philosophy, botany and mineralogy, but also with pharmacy and its practical applications, and with some of the most important branches of medical science, viz. the

* The *Times* suggests that Mr. Lowe should now adopt for his crest a match smoking *proper*, with the motto "*Et Lucifer et Luctifer.*"

action of remedies on the human system and their mode of application.

Very rarely indeed do we find a single man to have mastered, in all their details, half-a-dozen sciences, and it is a fair question to consider whether the division of such a vast undertaking among different specialists would not result in a work more satisfactory to the authors and to their readers. We do not pretend to be endowed with sufficient insight into all these sciences to pass a critical verdict upon this book as a whole, and gladly we will restrict ourselves to the pharmaceutical or rather chemical part; we do so the more readily, because the first volume now before us,—after a short introduction and a discourse on general pharmacology,—embraces that part of special pharmacology which treats of remedies derived from the inorganic world.

The author states in the preface that in the general plan and arrangement of his book he followed Pereira's 'Elements,' third edition of 1851,—the last edition of 1864 is evidently not known to him; he also gives a number of other books used by him generally, and for pharmaceutical preparations he quotes Mohr's 'Commentar' as his authority; *i.e.* he has copied him wherever possible.

We might have expected in this volume, which treats chiefly of the elements and their combinations, some references, however slight, to chemistry in general, to the development and changes in the interpretations of a science which, during the last twenty years and more, have made its study both so difficult and so fascinating; but not a word is said on the subject: there are the antiquated names and formulas, as if settled for all time; the formulas very often wrongly given, and, on reading article after article, one is often tempted to look back to the title-page to see whether the book really has been written in this century.

It is evident chemistry is not the author's speciality; it is also equally evident that the chemical part, written in the most dreary style imaginable, must deter any student, be he ever so enthusiastic, from following up his chemical pursuits, if left to this book.

The author has not the grasp of mind to see before him the whole field, to systematically work out a plan; it is only too clear that in compiling the work he has consulted many others; he has copied here a bit and there a bit, without having the capacity of welding the parts into one homogeneous and harmonious whole. The inevitable consequence is—as the result of much labour, we are sorry to say so—complete failure and disappointment.

Now, in a book of reference like this, including so many different topics, the strictest adhesion possible to a clear and well-digested system is absolutely necessary; and, we must confess, it is exactly the defiance of this necessary rule which struck us first on reading this book.

To substantiate such serious accusations, we have only one difficulty, viz. to select a few from the many proofs we meet with on every page.

The inorganic world is divided into Class I., non-metallic substances; and we expected, of course, to come in due time to Class II., metallic substances, but at the end of the ten non-metals and their compounds, grouped into so many orders, the author has forgotten his system, goes on without division to Order XI., potassium, and so on to the end of the book with all metals.

A confusion more tantalizing, because constantly repeated, is the truly impartial freedom with which the different scales of temperature are made use of. Fahrenheit, Celsius and Réaumur are given indiscriminately; and this is the more surprising in a German book, as Fahrenheit's scale is utterly unknown in Germany. Sometimes two scales, in charming harmony, are brought together in one sentence; so on page 100, we read, "water expands at 32° F., it forms crystals (a novel way of describing the freezing of water), and it boils at 100° C."; or at page 151, "iodine melts at 107° C., and becomes gaseous at 140°–144° R." Then again, sometimes no scale is given at all, as under iodoform, page 165, where an alcoholic solution of iodine is to be warmed to 35°–40°.

From the liberal use of Fahrenheit's scale, and much internal evidence, it is only too apparent that the book is chiefly a mere translation of Pereira of 1851; but by great curtailment of the original, much valuable information is omitted. There is not a single woodcut; the diagrams of chemical decomposition, giving such clear representation of the process, are left out, and verbal descriptions, often hazy and incorrect, are substituted.

The greatest carelessness is shown in the enumeration of the elements and their compounds; sometimes their symbols and equivalents are given, sometimes not, as under Na, Ba, Al, etc.; the same with pharmaceutical preparations, the composition of which is given after the name, but just as often not.

After carbon we read, vapour density (?) of carbon = 1; and we must assume from the query, that the author could not realize the idea of carbon vapour density.

Most apparent is the absence of systematical arrangement in nomenclature. We will quote a few of the headings of the iron salts. Here we have, ferrum sulphuricum crystallizatum, persulphas ferri, ferrum chloratum, ferrum bromatum in maximo, ferrum ammoniato-sulphuricum, ammoniacum hydrochloratum ferratum;—and this is a fair specimen of the style throughout the book.

We will conclude with a few extracts, taken at random, which, better than any words, will show the value of the book.

Creasote and petroleum are essential oils.

Graphite is brought from Borrowdale to London, and sold by auction, or in a public-house in Essex Street, Strand, every first Monday in the month.

Phosphorus is made from bone-ash ($3\,CaO\,PO_5$), which on being mixed with water and sulphuric acid, gives off carbonic acid.

Sulphuretted hydrogen is at 55° F. a transparent liquid;—the slight matter of a pressure of 15° to 16° atmosphere being forgotten.

Sesquicarbonate of ammonia is frequently used for effervescing powders.

Kali picronitricum, nitrophenol and picric acid are one and the same substance.

Kali causticum, the formula of which is KO, is brought into the market in solution, as a fine powder and fused.

Forty pages further on, we find again kali hydricum fusum and solution, as separate articles.

British soda-water often contains copper and lead.

Soda-saltpetre is only found in South America.

And so we might go on and copy the whole book.

The directions for making the pharmaceutical preparations are throughout correct; as before stated, they are taken from Mohr's 'Commentar,' a valuable book, well known in this country, as translated by Dr. Redwood.

Altogether we must agree with the author of this book, when he states in the preface, it is possible—nay, even probable—that a more experienced pen than his might have been more successful in collecting, arranging and digesting the different substances.

BOOKS RECEIVED.

Select Methods in Chemical Analysis (chiefly Organic). By William Crookes, F.R.S., etc. London: Longmans. 1871. From the Publishers.

George W. Childs. A Biographical Sketch. By James Parton. Philadelphia. 1870. From the Author.

Obituary.

The *American Journal of Pharmacy* announces the death by an accident, at the age of thirty-four, of Mr. FERRIS BRINGHURST, of Wilmington, Delaware, a prominent and much-esteemed member of the American Pharmaceutical Association. The deceased gentleman was engaged in the preparation of a quantity of oxygen from chlorate of potash, for the illustration of a lecture he was about to deliver to the members of a working men's institute, when the iron apparatus he was using burst. One of the fragments struck him on the forehead, inflicting a dreadful wound and causing his death a few days afterwards.

The following journals have been received:—The 'British Medical Journal,' April 22; the 'Medical Times and Gazette,' April 22; the 'Lancet,' April 22; the 'Medical Press and Circular,' April 26; 'Nature,' April 20; the 'Chemical News,' April 21; 'Journal of the Society of Arts,' April 19; 'Gardeners' Chronicle,' April 22; the 'Grocer,' April 22; 'Produce Markets Review,' April 22; the 'English Mechanic,' April 21; the 'Food Journal' for April; the 'Photographic Journal,' April 18; the 'Journal of the London Institution,' April 18; 'Proceedings of the Royal Institution;' the 'Brewers' Guardian,' April 24; 'Philadelphia Medical and Surgical Reporter,' Nos. 733, 734; the 'New York Herald,' April 5.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department*, 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[191.]—WHITE SHELLAC.—To obviate the annoyance occasioned by the alteration that white shellac sooner or later undergoes, dissolve it as soon as received from the maker in methylated spirit, so that one fluid ounce shall contain half an ounce by weight. In this fluid form it is at once available for polishes; and should a little of the solid be required, it can readily be obtained by precipitation with hot water. This suggestion is addressed, of course, to small and unfrequent consumers only.—T. B. GROVES.

[220.]—DISPENSING.—

℞. Quiniæ Sulphatis ℈ij
Acid. Hydroch. Dil. ʒivss
Pot. Iodid. ʒiss
Tinct. Iodi ʒiij
Syr. Aurant. ℥iv
Spt. Chlorof. ʒij
Aq. ad ℥viij. M.

This prescription is one of those which never give satisfaction to the dispenser, and often creates a feeling of distrust in the mind of the patient for whom it was written. It is impossible to mix it and not have decomposition. I consider the following to be the best manner of preparing it:—

After selecting the 8-oz. bottle, let an ounce of water be put into it, and then introduce the "iodide of potassium;" when perfect solution has taken place, add the "diluted acid" and the "syrup of orange," shake well together; then, having previously weighed the "quinine" and powdered it finely by passing a knife over it, introduce it into the bottle and shake well. Mix the "tinct. of iodine" and the "spt. of chloroform" together, and add this gradually (shaking well at each addition) to the mixture.

When prepared in the above manner, it assumes a reddish, opaque colour, but, after standing for some time, changes its appearance and becomes almost bright, a precipitate is thrown down (iodide of quinine?) and a scaly film is formed on the surface of the mixture, both of which, to a certain degree, disappear when the mixture is well agitated.

If the prescribed dose be mixed with a wineglass of water and well stirred, it still does not form a perfect solution.—C. T. J.

[221.]—SULPHATE OF LIME is valuable to farmers; 10 cwt. per acre being used as a top dressing for clovers, trefoil, cinquefoil, etc.—H.

[*** It should be remembered that there is a difference between the sulphate of lime used, in the form of gypsum, as manure and the residue from the production of carbonic acid gas, inasmuch as the latter contains free sulphuric acid.—ED. PHARM. JOURN.]

[222.]—TINCTURA COLOCYNTHIDIS, known also as "Dahlberg's Tincture."—The following is from the Prussian Pharmacopœia:—

Colocynth Pulp (cut small and free from seeds) ℥j
Aniseed ʒj
Proof Spirit, 1 lb.

Digest for eight days, express and filter.
Dose.—6 to 20 drops.—C. T. J.

A similar answer has been received from F. O. Collins.

J. T. C. thinks that *J. Whitfield* is wrong in stating the time for *maceration* of the above to be *three* days. According to Beasley's 'Book of Prescriptions,' Neligan prescribed the Prussian formula, which is—

Colocynth ℥j
Aniseed ʒj
Proof Spirit, 1 lb. (not 14 oz.)

Digest for *eight* days, express and filter.

[226.]—COD-LIVER OIL JELLY.—*C. E. L. N.*, if he can meet with some true sweet almond flour (I have none), is recommended to try my glycylæum. See article of that name in the proceedings of the Dundee meeting of the Pharmaceutical Conference. A little ingenuity spent upon it would make it, I think, a useful item of elegant pharmacy.—T. B. GROVES.

[228.]—SYRUPUS TONICUS.—Easton's syrup, flavoured with orange flower-water, is largely prescribed in Manchester and its neighbourhood under the name of "syrupus tonicus."

Each fluid drachm of this preparation contains:—

Phosphate of Iron	. . . . .	1 grain.
,, Quinine	. . . .	1 ,,
,, Strychnine	. . .	$\frac{1}{32}$,,

—JAMES WOOLLEY, *Manchester.*

[229.]—STRAINERS.—In answer to *J. W.*, I beg to say that a piece of fine muslin placed in the neck of the funnel is very useful. It must not be pressed in too tight.—GEORGE ADAMS.

During the cotton famine a substitute for cotton wool, prepared from flax by the process of the late Chevalier Clausen, was offered for sale by Messrs. Bourne and Taylor. For some years I saw, much to my annoyance, some pounds of it lying about in my wareroom unsaleable, for it did not take. Now I am equally annoyed to note its gradual disappearance, for I have devoted it to the purpose indicated by *J. W.*, and do not certainly know whence to obtain a fresh supply. Its advantages are these—it is cleaner and finer than tow, not so fine as cotton wool, and *is not repellent of water*, which is its crowning superiority.

The best woven strainer that I have discovered is crinoline, or at least a cheap cotton material that goes by that name. Its stiffness—due to starch or some cereal flour—must be removed by washing in very hot water. Then it appears like a coarse and strong muslin. For press bags I have selected strong serge, after trying canvas, duck, etc. I am told that a kind of twilled flannel is still better. I saw it in use at the laboratory of Messrs. Evans, Liverpool, but have not yet succeeded in finding out where it can be purchased in the ordinary way of business. I may add, though, that Messrs. Evans kindly offered to spare me some at, I think, about 5*s.* per yard.—T. B. GROVES.

[231.]—BEETLE POWDER.—In reply to "*Give and Take's*" request for a beetle powder, he will find the following very good:—

R. Red Lead, 4 oz.
Flour, 1 oz.
Powdered Sugar, 1 oz.

M. Place a little of the powder on a small piece of paper. Cats or dogs will not touch it. I will warrant it to kill any amount of beetles.—S. G. M.

[234.]—A PROBLEM FROM DOVER.—

R. Liq. Quiniæ Ammon. ℥iss
Syr. Ferri Phosph. ℥j
Ferri Ammon. Citr. ℈j
Acid. Phosph. Dil. ʒiss
Aquæ Menth. Pip. ʒiis
Ammon. Phosphat. ℈iij

M. ft. mistura.—A. B.

Ferri ammonio-citratem in aqua menthæ piperitæ solve, ammoniæ phosphatem in acido phosphorico diluto; ferri phosphatis syrupum quinæ ammoniatæ liquori adde, denique simul omnia misce.—SCOTICUS.

[240.]—DISPENSING.—The following prescription was brought to me to dispense:—

R. Sp. Ætheris,
" Lavandulæ,
" Ammon. Ar., aa. ʒij
Mist. Camph. ad ℥viij.

M. ft. mist.

The person called the day following to say that some mistake must have been made in its preparation, as it had been made up at one of the first houses in London, and was of a reddish colour. My mixture was colourless.

Please inform me what appearance the mixture should present when properly dispensed.—J. CROOKES.

THE TASTE OF COD-LIVER OIL.—Dr. Aubrey Wicks, in a letter to the *Lancet*, says that the fishy taste of cod-liver oil may be modified by placing a few grains of chloride of sodium on the tongue before taking a dose. "With this simple adjunct, patients who before rejected the oil will take it with apparent relish, describing the taste as that of herring or sardine." A piece of bread may be eaten afterwards. Dr. A. S. Hudson, writing to the *American Medical Gazette*, says that the taste may be wholly disguised by adding to one pint of the oil half an ounce of tincture of gum guaiacum and a drachm of essence of gaultheria.

[236.]—DISPENSING.—The following prescription was brought to me to dispense a few days since; as the quantity of bromide was so excessive, will some of your readers kindly say what they would do in such a case?—

R. Potassæ Chloratis ʒij
Potassii Bromidi ℥j
Inf. Gent. recentis ad ℥viij

A sixth part thrice a day.—J. H. G., *South Hants.*

[237.]—RED INK.—Can any of your readers give me a good receipt for bright red ink?—J. H. G.

[238.]—TOBACCO PAPER.—Please give me in your next impression a formula for making the "tobacco paper" used by gardeners to burn in greenhouses to kill insects.—A. P. S.

[239.]—CREAMY FURNITURE POLISH.—*C. W. S.* would feel obliged if any correspondent would favour him with a formula for a cream of furniture polish.

CULINARY ESSENCES.

(*From the Chicago Pharmacist.*)

Flavour of Ginger.

Take of Ginger Root, bruised, 2 oz. troy
Wild Ginger (Asarum), bruised, 1 drm.
Lemon Peel, bruised, 1 oz. troy
Diluted Alcohol 16 fl. oz.

Macerate for fourteen days and filter.

Flavour of Lemon.

Take of Lemon Peel (fresh), cut thin, 2 oz. troy.
Oil of Lemon (fresh) 1 fl. oz.
Alcohol, 95 per cent., 12 fl. oz.
Water 4 fl. oz.

Digest for eight or ten days and filter.

Flavour of Nutmegs.

Take of Nutmegs (grated) 1 oz. troy.
Oil of Nutmegs 2 fl. drms.
Diluted Alcohol 16 fl. oz.

Digest for eight to ten days and filter.

Flavour of Orange.

Take of Orange peel (fresh), cut thin, 2 oz. troy.
Oil of Orange (fresh) ½ fl. oz.
Alcohol, 95 per cent., 12 fl. oz.
Water 4 fl. oz.

Digest for eight to ten days and filter.

Flavour of Rose.

Take of red Rose leaves, in coarse powder, ½ oz. troy
Oil of Rose, pure, 5 drops
Alcohol, 95 per cent., 6 fl. oz.
Water 10 fl. oz.

Dissolve the oil in the alcohol, mix with the water and macerate the rose leaves for eight to ten days in the menstruum and filter.

Flavour of Tonqua Bean.

Take of Tonqua Bean, bruised, 4 oz. troy
Orris Root, in powder, ½ oz. troy
Diluted Alcohol 16 fl. oz.

Digest for fourteen days and filter.

Flavour of Vanilla.

Take of Vanilla Bean, cut very small, 2 oz. troy
Diluted Alcohol 16 fl. oz.

Digest for three to four weeks and filter.

Flavours of banana, pineapple, raspberry and strawberry, termed fruit essences, are alcoholic solutions of the amyl and ethyl ether series.

Flavour of Pineapple.

Take of Essence of Pineapple (artificial) 6 fl. drms.
Diluted Alcohol 14 fl. oz.
Simple Syrup 1 fl. oz.
Tincture of Cinnamon 2 fl. drms.

Mix.

Flavour of Raspberry.

Take of Essence of Raspberry (artificial) 1 fl. oz.
Diluted Alcohol 12 fl. oz.
Syrup of Raspberry (fruit) 2 fl. oz.
Tincture of Orris Root (4 oz. to the pint)
Tincture of Cochineal, of each ½ fl. oz.

Mix.

Flavour of Strawberry.

Take of Essence of Strawberry (artificial) 1 fl. oz.
Diluted Alcohol 13 fl. oz.
Syrup of Raspberry (fruit)
Syrup of Pineapple (fruit) of each 6 fl. drms.
Tincture of Cochineal ½ fl. oz.

Mix.

Correspondence.

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

The Preliminary Examination.

Sir,—Would you kindly allow me space for a few words in reply to the letter of your correspondent B. S., contained in your last issue?

Whilst I think it highly desirable that every encouragement should be given to those who are desirous of possessing the Minor or Major qualifications, yet I think it unfair that they should be admitted to this ground by passing along the temporary bridge of "the Modified" instead of by the proper road from the Preliminary. The Modified Examination, as I understand, was provided for those young men who were thought to have a vested interest in the trade sufficient to entitle them to a less stringent examination, and thus far I think their case was met; but there were others who would gladly have availed themselves of the "Modified," and who had been even longer in the trade than some of those eligible for the "Modified," but were kept out by reason of their age, not having attained twenty-one years. Those young men, after having been six or seven years in the trade, were compelled (as I know in many cases where they have gone to business young) to work up what "they" had never learnt at school, viz. their Cæsar, etc. I don't see that it would be doing this class of young men justice, who have not had what I should almost call the privilege of laying claim to the "Modified," to allow those who have been thus privileged to take step No. 2 before having taken step No. 1.

But lastly, and chiefly, in your editorial article of last week on the Preliminary Examination, you state that the objection raised by your correspondent B. S. loses all its force from the mere fact that two of the passages given are actually such as might occur for translation in every-day business. I am quite of your opinion, Sir; and, moreover, I cannot see that there would be much gained by being admitted to the "Minor" without having passed the "Preliminary" (although the Latin is of a medical character, and consequently more familiar to persons in the trade); still I think that where the elementary knowledge required in the Preliminary is wanting, there would be an inability to render in full Latin the prescriptions given in the Minor.

13, *Hereford Road, W.* Minor Associate.

Sir,—In perusing your Journal of to-day, my attention was drawn to the above subject, on which I may, perhaps, be allowed to make these few remarks. Although the examination questions of the 3rd inst. were more stringent than those formerly selected by the Board of Examiners, still there was not the stringency in them which should prevent the candidate from obtaining the number of marks entitling him to registration as an apprentice. I hope that those who did not prove successful will persevere with the subjects, in order that they may be more successful when they offer themselves again. There are some candidates who ought not to be surprised to find themselves plucked. I have known those who thought to pass this examination by simply studying each alternate book of Cæsar or the first half of Book I., and acting similarly with the declensions and rules of the Latin grammar, etc. But if the candidate wishes to pass without having to offer himself a second time, I would strongly recommend him to study the subjects throughout. In the 43 per cent. of unsuccessful of the 3rd inst. I have no doubt there were several who knew very little or nothing whatever of the Latin language before they entered their term of apprenticeship. It must, of course, then be extremely difficult for them to study classics and attend to the routine of their business. In order to obviate this difficulty of apprentices, some step should be taken by the Society in distributing papers respecting the subjects of this examination to most of or all public schools where the Latin language is taught, in order that the principals of such schools might make known the subjects to those boys who wish to enter the business of a chemist and druggist. This would obviate a great difficulty of apprentices, as they would then be aware of the classical examination that they had to undergo during their apprenticeship, which many would pass before leaving school. I have heard apprentices who are in the trade say they wished that they had known in their school days that such an examination was compulsory, as they would have then taken the opportunity of passing it before leaving school instead of being troubled with it during their apprenticeship, while they might be studying other subjects in order to enable them to pass the other examinations of the Society. And I have not the least doubt that there are numerous apprentices in the trade who have not yet passed the Preliminary Examination, but who would have been too glad to have passed it before leaving school for their term of apprenticeship, had they known it before. If the Society would adopt the above or some similar plan, I think the Board of Examiners would not only find an increase of successful candidates in the Preliminary, but also in the Minor and Major Examinations.

Atherstone, April 22nd, 1871. George Sant.

Syrup of Phosphate of Iron.

Sir,—In looking over recent suggestions as to syr. ferri phosph., I notice a letter from Mr. Rose in the Journal of the 8th of this month, commenting on a form given by Mr. Carteighe in a previous number, and suggesting the addition of more sugar.

Mr. Rose recommends that 12 fl. oz. should contain $8\frac{1}{2}$ oz. sugar. Now Mr. Carteighe, in his form, adds to the 2 fl. oz. acid and water, containing the iron, 10 fl. oz. syrup, which contain $8\frac{1}{2}$ sugar (if made according to the Pharmacopœia); therefore I cannot see any improvement in Mr. Rose's form, as it takes the longer of the two to prepare, and gives exactly the same result as Mr. Carteighe's.

Notting Hill, April 22nd, 1871. E. B. Starkey.

Sir,—Desiring to make some syr. ferri phosph. in accordance with the formula proposed by Mr. Carteighe, and having no phosphoric acid of the required strength, I determined to prepare a quantity from some glacial phosphoric acid which I had in sticks. The necessary amount was dissolved in a composition evaporating basin, and the solution heated until it ceased to give a precipitate with solution of albumen, and afforded the necessary reactions with the ammonio-nitrate of silver test; it was then evaporated to the sp. gr. 1·500. Freshly precipitated ferrous phosphate treated in the prescribed manner, became dissolved in a few seconds, but (the solution) became quite milky on dilution with water, or syrup; an older sample of phosphate was only dissolved in part, a white-looking compound remaining insoluble, and on filtration, the clear filtrate behaved in a like manner, when similarly treated. If any of your correspondents could inform me as to what was the probable change the acid had undergone, which is not indicated by the ordinary reagents, they would help me out of a difficulty.

London, April 22nd, 1871. Aliquis.

The Sale of Poisons.

Sir,—Allow me to inquire, through the medium of your Journal, if the trade generally are aware that tinct. opii is frequently retailed from small village shops (not registered) as narcotic tincture, opiated tincture, etc., and supplied to them by many who call themselves leading chemists? I know instances where pharmaceutical chemists have even done this. Is it fair play to those young men who study for months together to pass the required examination, for them to find that a complete novice can sell the same poison under a different nomenclature? If this is to continue, what benefit has the registered chemist over the shopkeeper as to the sale of prohibited drugs?

Grantham, April 21st, 1871. A. P. S.

Jury Service.

Sir,—As the time is drawing very near when the Pharmaceutical Society will hold its annual meeting, may I again trouble you for space to suggest to our Council the desirableness of recommending to the Privy Council a regulation which would tend much more to the safety of the public than poison cupboards, keys, etc. *i. e.* "That *all* chemists on the Register be exempt from serving on juries." Indeed Dickens, in his trial of Pickwick, puts the reasonableness of the suggestion very clearly before the public, where he says "The chemist on being summoned to the trial as a juryman begged off, on the plea that he had only a boy to mind the shop, who did not know Epsom salts from oxalic acid."

I do not think it fair that a man should be compelled to leave his business, when upon the proper fulfilment of his own duties in that business depends the safety of many lives, or even the ruin of his business.

Manchester, April 22nd, 1871. W. B. O.

A Proposal to Enforce Early Closing.

Sir,—May I ask you to be good enough to spare me a small space to bring before the members of the profession a subject which has appeared several times before in this Journal, but unfortunately no person, having any amount of influence over the profession, having taken it up, it was allowed to drop as an impossibility? It is that of early closing. Now that the Pharmaceutical Society requires so much scientific as well as practical knowledge, there ought to be some measures taken to enforce early closing, that assistants and apprentices (more especially in Town) might have an opportunity of preparing themselves for the requisite examinations. I think as the Council have the power to revise and amend the laws, etc. relating to pharmacy, they might make an addition to the new Act of 1868, very advantageous to the rising generation of pharmacists. If I might be permitted to suggest the following addendum, to be made to the eighth clause of the Pharmacy Act 1868, 15 & 16 Vict. c. lvi., I am sure it would be hailed with delight by all young persons engaged in the metropolis; some such words as the following might be used:—"And to enable persons to attain the necessary qualifications, all persons in Great Britain practising as denoted in clause 3 of the Pharmacy Act 1868, 31 & 32 Viet. c. xxi., shall, after the —— day of —— 1871, close their shops, or cause them to be closed, and shall suspend business entirely (except in case of urgent medicine being required, which, of course, some person must be at home to attend to) at eight o'clock, P.M., and no persons in their employ shall be detained after that time, but shall be allowed to study or otherwise make use of their time, neither shall they be employed more than twelve hours in each day, including an hour and a half for meals; in violation of this law such persons to be fined such sum as the Council may think fit." I can safely say that if the Council would give this matter their consideration, a material difference would be seen in the attendance by members, etc. at the various meetings of the Society, and Mr. Haselden, V.P., would no longer have to complain of the poorly attended meetings. The Society would be remunerated by a greater number of candidates presenting themselves for the respective examinations. I am longing to see this matter taken up by some of our influential members.

Aspirant to the "Major Qualification."

The Fraternity of the Profession.

Sir,—Now that the poison regulations question is fairly on its way to an end, I think the Council would do well by endeavouring to infuse a more fraternal spirit amongst the whole body of chemists. Without the exception of any other profession, we are, I think, the most jealous of each other, whereas it should be quite the reverse of this; for surely an educated chemist ought by virtue of his education, apart from even any higher motive, to be above such behaviour as is too often shown towards those of the same calling.

I had occasion some few days since to visit one of these brethren, wishing to obtain from him a small quantity of chloral hydrate. I asked for half a drachm, and, having omitted taking a bottle, I requested that I might be furnished with one. This was done by supplying a one-ounce wide-mouth stoppered one. I then asked the price of the whole, and was told one shilling. Note, this price was to one of the profession; what it would have been to the public it is impossible to say; but I think there are few London establishments where more would have been charged in the retail.

While such ill-feeling as this exists amongst us, we cannot expect the cause of pharmacy to make much advancement; but were we more friendly towards each other, and tried to facilitate each other's "common interest" (even if nothing more) in everything pertaining to the profession, with such a union we should possess strength.

Bloxham, April 11th, 1871. J. T. Newey.

A Queer Customer.

Sir,—As I think the enclosed might contribute to amuse your readers, I hope you will give it a place when there is a spare corner in the Pharmaceutical Journal. You see it is indited on elegant tinted paper, and it was presented by a small boy at my counter with the modest accompaniment of 1*d.* to pay for its prescribing and dispensing.

Marlow, April 19th, 1871. Charles M. Foottit.

"if yow plees will you send me soom iwas
porely for three days no it stopt iam in such
pain in my belley and stomek aged 48
willam ilowers
cookham
deen"

Cautions.

Sir,—The communication in your Journal of the 22nd inst. from Mr. Eve respecting a person who calls himself Fischer, recalls a slight personal experience of my own. Many months ago Mr. Fischer called upon me in a town quite remote from London, and begged for money to enable him to travel a stage further, using the names of scientific chemists in the north of England with much freedom.

Mr. Eve's letter convinces me that anything which I gave him was badly bestowed, and that it will be well for the future that our body should be relieved from Mr. Fischer's importunities. F. C. S.

Sir,—In your issue of March 18th, I saw advertised a literal translation of the first book of 'Cæsar's Commentaries' at the price of 2*s.* 6*d.*, to apply to "Casticus," General Post Office, Birmingham. Being an apprentice studying for the Preliminary Examination, I applied for the translation, enclosing thirty-one stamps. Not having received a reply, I wrote to inquire the cause, and have never yet received a reply, neither in the shape of book or otherwise. I should be very much obliged to you if you would furnish me with the proper name and address of the advertiser, as I think it very hard indeed for young apprentices as myself, anxious to acquire knowledge and to "get on" in the pharmaceutical profession, to forfeit our money to unprincipled persons, in the attempt to get books for the furtherance of our knowledge.

I enclose stamped and directed envelope for reply.

M. Leigh.

[*** In reference to this communication, we are informed by the Publishers that they are unable to comply with our correspondent's request to be furnished with the proper name and address of the advertiser, the order for the advertisement being only dated "Birmingham." It is just possible that it is *bonâ fide*, but it is more probable that it is a swindle, so we insert our correspondent's letter in order to prevent, as far as possible, any further mischief being done.—Ed. Pharm. Journ.]

"Inquirer."—Apply at Apothecaries' Hall.

"Boiler Composition."—Boiler incrustation generally consists of the carbonate and sulphate of lime contained in the water used for generating steam.

J. T. Robertson.—We are informed that Mr. Gerrard's improved suppository mould may be obtained from Mr. Mather, of Newgate Street. The prices are for six, 5*s.*; twelve, 13*s.*; twenty-four, 32*s.* each.

W. J.—We have no means for furnishing formulæ of proprietary articles.

T. S. Johnson.—Our correspondent was in error. It is unnecessary to label the medicine "poison," provided the formula be copied in a book.

G. Adams.—You would be right in using the preparation of the London Pharmacopœia.

"July."—Certificates cannot be issued from the office in an imperfect state.

"An Inquirer."—We have no knowledge of any such Bill having been introduced.

Communications, Letters, etc., have been received from Mr. G. Adams, Mr. M. C. Cooke, Mr. F. Thompson, Mr. H. J. Baildon, Mr. R. Hedley, the Secretary of the Liverpool Chemists' Association, W. R., J. T. C., S. G. M., "Guaco," "Scoticus," "Inquirer," "Southsea," "Pro Bono Publico." We have also received communications from "Spes," "Errata," and E. B., in which the requirements as to anonymous letters have not been complied with.

PARCHMENT PAPER AS A FILTERING MEDIUM.

BY CHARLES R. C. TICHBORNE, F.C.S., ETC.

The Bunsen filter is now well known and familiar to most manipulators. It merely consists of a funnel and filter connected with an air-tight vessel, in the interior of which a partial vacuum can be produced, either by a Sprengel or ordinary air pump; in fact, by any contrivance by which a downward pressure of some considerable power is exerted upon the fluid washing some precipitate, or upon a liquid it is desirable to filter quickly.

To give us the opportunity of doing this properly, it is necessary to have a nicely prepared support beneath the nozzle of the filter, to enable it to bear the considerable pressure to which it is exposed; the nozzle of the filter being the point of weakness. This is generally done by very carefully forming a little cone of platinum foil, which must exactly fit the bend of the funnel. If the fit is not perfect, it generally results in the breaking of the filter and the failure of the experiment. This is at once obviated, and the platinum nozzle dispensed with, by using parchment paper as a filter. Parchment paper bears, under such circumstances, any reasonable pressure; and yet it is a perfect filtering medium. As regards the strength, Dr. Hofmann says that it becomes five times as strong as the paper before it is parchmentized; and I think that, when speaking of moist bibulous paper, it is no exaggeration to say its strength is increased at least twenty times.

In making the parchment paper for this purpose, the following method should be adopted. It differs very little from the ordinary one, except as regards a few precautions:—I use one part of pure sulphuric acid and one-half part of distilled water well mixed in a dish or shallow vessel. Where practical, this mixture should be ice cold, and under no circumstances must it be used while it is warm. Pieces of Swedish filtering-paper should then be dexterously floated upon the acid, so as to bring every particle of the surface in contact with it. But it is not necessary to parchmentize both sides. The next point of importance after the cooling of the acid mixture is the quickness used in the washing, which must be thorough.

This paper, which has proved itself so useful to us for dialytic purposes, forms the most perfect filtering medium, if properly managed, with which I am acquainted. Although, under ordinary circumstances, it is nearly impervious to fluids, they pass through with perfect facility under pressure. The structural change produced by sulphuric acid upon cellulose is the converse of most of the other acids. Thus in paper converted into pyroxylene by the action of nitric acid the fibres are seen, when examined with the microscope, to be more or less contracted, and the result is a non-contiguous, or friable structure, covered with small holes; but in parchmentized paper the fibres are swelled considerably in bulk, and are converted into a colloid or gelatinous substance, which, although slowly pervious to fluids, is very homogeneous in texture, and hence its strength.

In Bunsen's original paper he speaks of the difficulty of preventing filaments of the paper used from becoming mixed with precipitates. "Thus," he says, "another and an inestimable advantage springs from the peculiar condition of a precipitate filtered by this method,—the surface of the filter becomes injured and torn, so that the precipitates become mixed with filaments of paper. Gelatinous precipitates (when washed under pressure) adhere to the filter in a thin coherent layer, and may be removed piece after piece so completely that the paper remains perfectly clean and white." Now parchment paper is of that nature that it might be scraped with a knife or brushed, without invalidating a quantitative analysis.

Parchment paper would be perfection for filtering by pressure; but, alas! it has one drawback. The practical difficulty is in making the filter lie close to the funnel, so as not to permit atmospheric air to pass down by the side, instead of exerting its pressure upon the surface of the liquid in the filter. This difficulty is removed by placing an inner filter of ordinary filtering-paper larger than the parchment-paper one; therefore, the latter should be thin, and only treated with acid on one side. It is from this reason that parchment paper may be used more advantageously in a Bunsen filtering-apparatus made on the principle of a percolator—the bottoms of the upper vessel being covered with good strong paper, strengthened with muslin; such an apparatus as this is applicable to many purposes, such as quick and thorough exhaustion of a powder by any menstruum, or the separation of crystals from a viscid liquid.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Continued from page* 843.)

Nat. Ord. Valerianaceæ.

This is another very singular Order of plants, most of them having an extremely powerful odour, which is due to an extraordinary series of chemical products.

Valeriana officinalis (Linn.).

This attractive plant is found growing in moist places. It is found in the Leigh Woods, Lock's Mills, Bedminster, Baptist Mills and on the banks of the Avon. The pink flowers are very conspicuous among the grasses and sedges of the water's edge. The leaves are used by the country people, under the name of Allheal, as a cooling application to whitlows and boils.

The roots (or rather rhizomes, from which spring fibrous roots) are a yellowish-white, becoming brown when dry. They contain 6 per cent. of resin and $1\frac{1}{5}$ per cent. of a volatile oil.

The essential oil of valerian is yellowish-green, having a strong odour of the plant, an acid reaction and a sp. gr. 0·9. It consists of 70 per cent. of valerol ($C_6H_{10}O$), which is a crystalline principle, easily changing into valerianic acid by the absorption of oxygen. The other constituent is borneine ($C_{10}H_{16}$) a liquid hydrocarbon isomeric with oil of turpentine. The valerianic acid ($C_5H_{10}O_2$) is, however, the most important to the chemist.

It is a colourless, oily liquid, and was first discovered by Chevreul in the fat of the dolphin. It occurs in the berries of *Viburnum Opulus*, and is produced whenever fatty matters undergo oxidation, or albuminous substances putrefy, so that it is frequently present in animal secretions.

For trade purposes valerianic acid is generally manufactured by the oxidation of amylic alcohol (fousel oil).

$$\underset{\text{Amylic Alcohol.}}{C_5H_{11}HO} + O_2 = \underset{\text{Valerianic Acid.}}{C_5H_{10}O_2} + H_2O.$$

For experimental purposes this acid may be produced by distilling valerian root with sulphuric acid and bichromate of potash. By this means, not only the acid naturally present in the plant passes over into the receiver, but also that produced during the operation by the oxidation of the valerol.

$$\underset{\text{Valerol.}}{C_6H_{10}O} + O_3 = \underset{\text{Valerianic Acid.}}{C_5H_{10}O_2} + CO_2.$$

Valerianic acid stands in exactly the same relation to amylic alcohol that acetic acid does to ethylic alcohol (C_2H_5HO), thus,—

$$\underset{\text{Amylic Alcohol.}}{C_5H_{11}HO} + O_2 = \underset{\text{Valerianic Acid.}}{C_5H_{10}O_2} + H_2O.$$

and—

$$\underset{\text{Ethylic Alcohol.}}{C_2H_5HO} + O_2 = \underset{\text{Acetic Acid.}}{C_2H_4O_2} + H_2O.$$

Another example showing the analogy is, that an ether is formed from the combination of valerianic acid and the base of amylic alcohol.

$$\underset{\text{Amyl.}}{C_5H_{11}} + \underset{\text{Valerianic Acid.}}{C_5H_{10}O_2} = \underset{\text{Valerianate of Amyl.}}{C_5H_{11}, C_5H_9O_2} + H.$$

This product is sold under the name of oil of apples.

It will, therefore, be seen how extensive a series of combinations may arise from the constituents of so simple a plant as valerian; indeed, far more than can be described in a paper like the present.

Nat. Ord. Compositæ.

From this, the most comprehensive group in the vegetable kingdom, only three English plants are mentioned in our materia medica. It is so named because the flowers are compounded of many smaller ones, enclosed in a calyx-like assemblage of bracts, termed an involucre. The general properties of the plants composing this Order are tonic, astringent and carminative.

Anthemis nobilis (Linn.).

This well-known plant is found on most of the waste places near Bristol, as at Hanham, Crew's Hole, Pill, Sea Mills, etc.

It is a common supposition among country people, that the more the Chamomile plant is trodden, the faster it grows. This idea is made use of by Shakespeare when speaking of the effects produced on the human constitution by an intemperate life, "For though the Chamomile the more it is trodden the faster it grows; yet youth, the more it is wasted the sooner it wears."

Both the common, or single, and the cultivated, or double, flowers are sold in the shops, and although the latter look the more handsome and are therefore often preferred, yet the single are far more efficacious, because they contain more essential oil. The oil is found in the disc, but in the double flower, the yellow, tubular, oil-bearing florets of the disc, are changed into the barren white rays.

The two principal constituents of the Chamomile are the volatile oil and bitter extract. One hundredweight of the flowers yields about two ounces of oil and forty-eight pounds of extract.

Oil of chamomile, like that of anise, is a compound of a peculiar substance, with a hydrocarbon isomeric with oil of turpentine ($C_{10}H_{16}$). The former is termed angelic aldehyde (C_5H_8O). When oil of chamomile is heated with dry hydrate of potassium, this aldehyd is converted into angelic acid ($C_5H_8O_2$), identical with that found in the roots of Angelica and Sumbul.

$$\underset{\text{Angelic Aldehyd.}}{C_5H_8O} + KHO = \underset{\text{Angelate of Potassium.}}{C_5H_7KO_2} + H_2.$$

Should the heat used be too strong, the angelic acid is washed and decomposed into propionic and acetic acids.

$$\underset{\text{Angelic Acid.}}{C_5H_8O_2} + 2H_2O = \underset{\text{Acetic Acid.}}{C_2H_4O_2} + \underset{\text{Propionic Acid.}}{C_3H_6O_2} + 2H.$$

The official extract is made by evaporating a watery infusion to a proper consistence, and adding fifteen minims of the essential oil to every pound of flowers employed, to restore that wasted during the process.

Taraxacum Dens-leonis (DC.).

This very common and ubiquitous plant has the credit for far more virtues than it probably ever possessed. Whether fresh or as preserved juice, as an extract or when actually torrefied, it seems all one and the same, with the same comprehensive attributes of a resolvent, aperient and tonic!!!

The juice of the root only is made use of in the Pharmacopœia. When expressed in the autumn months it changes its milky colour to a brown, and immediately coagulates and deposits caoutchouc. The juice also contains taraxacin, grape sugar, gum, a peculiar resin, inulin, and the usual alkaline and earthy salts. When pressed in the spring, the juice has a much less percentage of solids, and is more bitter from an excess of taraxacin. The latter, by the action of frosts and cold weather, becomes converted into mannite and glucose, producing the well-known sweet taste perceptible when the roots have been gathered in the latter part of the year.

The fresh roots yield about half their weight of juice. In the spring months, one pound of extract is afforded by eight or nine pounds of juice, while in the autumn only four pounds will yield that quantity.

When freshly-pressed taraxacum juice is received in water, and heated to 212° F., resin, caoutchouc and albumen separate. The filtered juice, after evaporation, yields crystals of taraxacin. They are slightly bitter, melt easily, and are soluble in water, alcohol and ether. When dissolved in the mineral acids, they do not suffer decomposition. The coagulum separated by the filter is then exhausted with hot alcohol, and set aside for spontaneous evaporation, when the so-called resin is obtained. This resinous substance is unaltered by alkalies or nitric acid. Sulphuric acid dissolves it, forming a yellowish liquid.

The dandelion roots, roasted and mixed with coffee, are sold under the name of dandelion coffee, but very commonly chicory roots, purchased in Covent Garden market, are used as a substitute. The so-called dandelion cocoa is nothing more than a mixture of ext. taraxaci with soluble cocoa.

The fruit of the taraxacum, with its stipitate pappus, is an interesting object, forming

"The schoolboy's clock in every town."

So beautifully is the seed balanced, that the slightest breeze carries it away like a miniature balloon.

Lactuca virosa (Linn.).

This plant does not occur very plentifully near Bristol, but may be gathered on St. Vincent's rocks and at Leigh. Its usual height is about two feet, and it never attains the size frequently seen in the south-eastern parts of England.

Bentham considers *Lactuca virosa* to be a variety of *L. Scariola*, only differing by the leaves being less glaucous and broader in form. If this opinion be correct, it would reconcile Dr. Sibthorp's objection to Sprengel's assertion, that *Lactuca virosa* was the θρίδαξ ἀγρία of Dioscorides. The lettuce is common in Greece and Italy, and was undoubtedly used by the Romans as a salad and medicine. Horace (Sat. 2. 8) speaks of its use as a provocative to the appetite :—

> "Rapula, lactucæ, radices; qualia lassum
> Pervellunt stomachum."

In another place (Sat. 2. 4), he says that lettuces are indigestible things for the habitual drinker, when suffering from dyspepsia and acidity :—

> "Nam lactuca innatat acri
> Post vinum stomacho."

The lettuce owes its medicinal virtues to the presence of lactucarium, or lettuce opium, a mild narcotic, and, like its poppy congener, is a compound of various principles. Its composition appears to be,—

Lactucone	48·95
Lactucin and Lactucic Acid	16·61
Caoutchouc	4·76
Albuminous substance	7·33
Mannite	2·65
Oxalic Acid	1·00
Resin, moisture, etc.	14·40
Ash	4·30
	100·00

Lactucone ($C_{40}H_{61}O_3$) is obtained from lactucarium by boiling alcohol, when it forms colourless, insipid crystals, which melt between 150° and 160°. They are insoluble in water, but readily so in alcohol, ether and oil.

Lactucin ($C_{22}H_{28}O_3$) is a yellowish, bitter, crystalline substance, which is not very soluble in ether, but more so in alcohol and acetic acid.

Lactucic acid is a yellow amorphous substance, obtained by the action of dilute sulphuric acid on lactucarium. Like mannite and glucose, it reduces cupric sulphate.

The *Lactuca sativa*, or garden lettuce, contains lactucarium, but in much less quantity. Schultz says a plant of *L. sativa* will yield 17 grains, while one of *L. virosa* will yield 56 grains.

Extractum lactucæ consists chiefly of lactucarium mixed with chlorophyll. One hundredweight of the plant will produce from four to five pounds of extract.

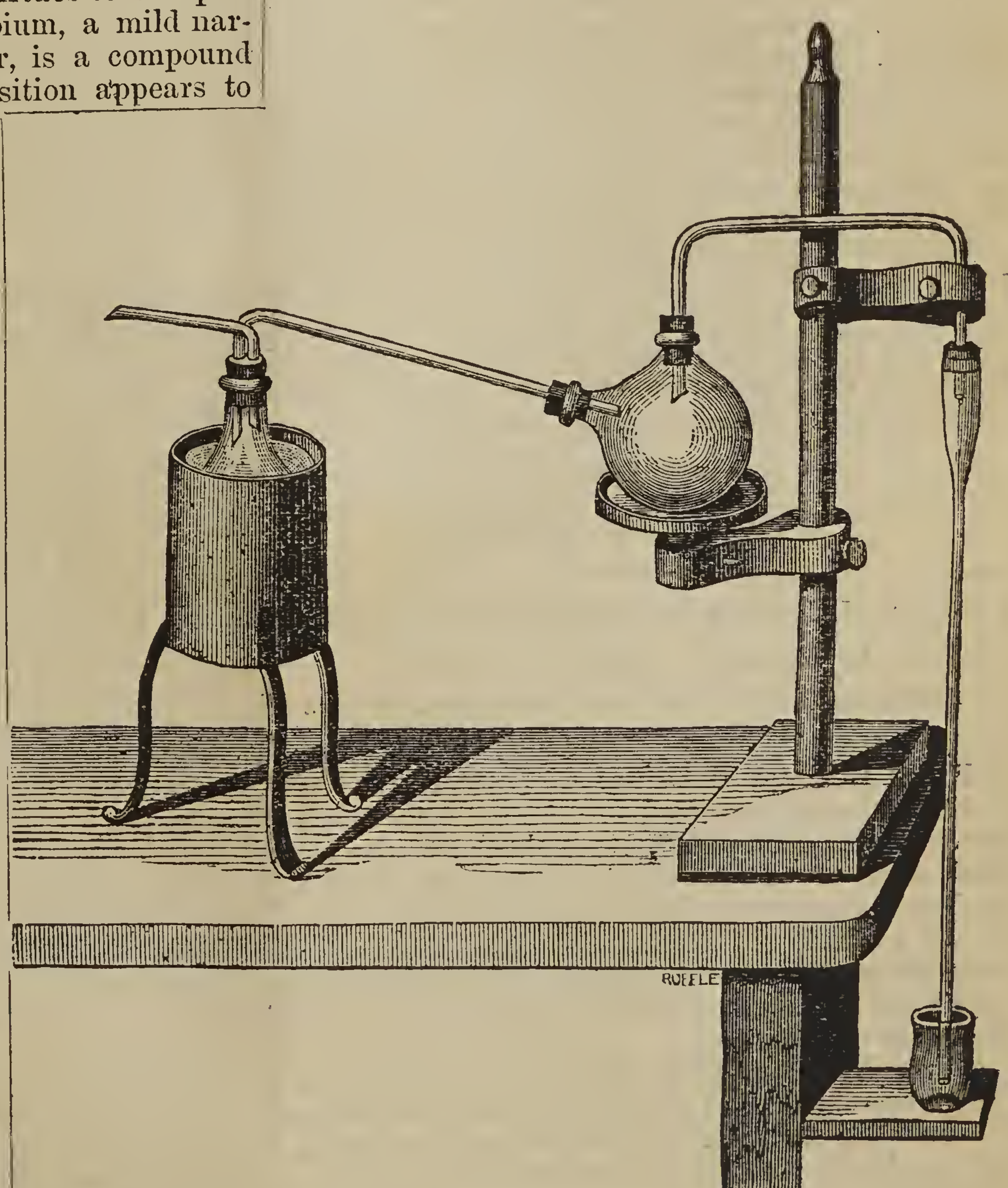
The proper time for gathering the lettuce for pharmaceutical use is about the *middle* of the time of inflorescence.

(*To be continued.*)

DISTILLATION IN PARTIAL VACUO.

The vessel in which the liquid is to be distilled may be either a flask or a tubulated retort, with a narrow neck fitting into a large, tubulated globe. Bend a glass tube twice at right angles, pass the short leg through the tubulus of the globe, and the long leg by means of an india-rubber cork into a wide tube holding about 100 c.c., and terminating in a very narrow tube at least 30 in. long; the lower end of this long tube to dip into a mercury trough.

Fit a bent tube into the flask or tubulus of the retort, and draw it out at a point outside the retort; attach a carbonic acid apparatus to this tube, and pass carbonic acid through the apparatus to expel all atmospheric air, or until the gas escaping from the long tube at the other end is completely absorbed by a solution of caustic potash. Now seal the tube by which the carbonic acid entered, at the narrow



point, pour about 100 c. c. of caustic potash lye on the mercury, and lower the trough until the tube dips into the lye.

Gently warm the globe, to expel a few gas bubbles; on cooling, the potash solution will rise to the widened part of the tube, after which the trough must be raised so that the tube dips into the mercury.

The absorption of the carbonic acid by potash produces a partial vacuum, indicated by the rise of mercury in the long tube, which at the same time shows that all the joints are air-tight.

The column of mercury must remain stationary for some time at a height of 15 in. above the surface of the mercury in the trough, when the liquid in the retort will be under a pressure of only half an atmosphere.

Then heat the retort and well cool the globe.

The use of an air-pump supersedes the potash apparatus. A T tube is introduced instead, one leg of which is connected with the air-pump, to draw out the air before and after the distillation, the second leg connects the globe, and the third is attached to a long tube dipping into mercury.

The success of the operation entirely depends upon the absolute perfection of the joints, for which india-rubber is the best material. Vulcanized corks and tubes are first boiled in a weak solution of caustic soda, they are then well dried and immersed in molten tallow; after several hours they are taken out and well cleaned with a cloth. Corks and tubes thus prepared make perfectly air-tight joints, they do not become hard and brittle, but preserve their elasticity. India-rubber melts at about 150° C. (302° F.). In case the heat applied during the distillation exceeds this temperature, the connection at the tubulus of the retort must be made with a sound cork, which is made air-tight by soaking it in molten wax or paraffin, and by painting a solution of caoutchouc in chloroform over the part above the tubulus.

Many organic substances, partially decomposed by distillation under ordinary pressure, such as glycerine, may be volatilized without decomposition, provided the receiver is well cooled to prevent the tension of the vapours from exerting any pressure.—*Commentar zur österreichischen Pharmacopœ.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Ferri Sulphas Exsiccata.—$FeSO_4H_2O$.

Sulphate of iron dried at a temperature which is gradually raised to 400°, loses six out of the seven molecules of water which it contains. This last molecule is only expelled by a much stronger heat; but if a solution of the salt be mixed with sulphate of potassium or ammonium, a double salt is produced in which the alkali sulphate replaces this seventh molecule of water.

Thus $FeSO_4, K_2SO_4, 6H_2O$. The sulphates of magnesium, zinc and copper form double compounds of a similar formula. Heated to redness, sulphate of iron leaves a residue of red ferric oxide, Fe_2O_3.

Ferri Sulphas Granulata.—A solution of freshly prepared sulphate of iron is filtered into rectified spirit. The salt being insoluble in spirit is precipitated in small granular crystals. Some experiments made by a student in the laboratory of the Society showed that this preparation is of the same composition as the ordinary sulphate of iron, having lost none of its water of crystallization. It is supposed to resist oxidation longer than the crystallized salt. To retard such change, it has been recommended to keep in the bottle containing sulphate of iron a small piece of camphor wrapped in paper.

Ferrum.—[§ Wrought iron in the form of wire or nails free from oxide.]

Chemically pure iron is almost unknown. The Pharmacopœia orders wrought iron to be employed for preparing the ferruginous compounds, because in that form it is practically least contaminated with foreign substances. The impurities contained in iron wire are chiefly minute quantities of carbon (average ·3 per cent.), silicon, phosphorus and sulphur. When ordinary iron is dissolved in dilute hydrochloric or sulphuric acid, the evolved hydrogen possesses an odour which is due to the presence in it of minute quantities of the hydrogen compounds of these elements. A small quantity of carbon also floats undissolved. This is much more noticeable when cast iron is used. Other substances are usually present, but in proportions smaller still, and interfere in no way with the employment of the iron for pharmaceutic purposes.

Iron filings are objectionable, as they are not only usually very dirty, but contain particles of other metals.

Ferrum Redactum.—[§ Metallic iron, with a variable amount of magnetic oxide of iron.]

Hydrated peroxide of iron contained in a gun-barrel is heated to redness in a current of pure and dry hydrogen gas. The greater part of the iron is thus reduced to the metallic state:—

$$Fe_2O_3, H_2O + 3H_2 = Fe_2 + 3H_2O + H_2O$$

A small quantity of it, however, does not lose the whole of its oxygen, and thus a certain proportion of magnetic oxide of iron is retained in the product.

$$3Fe_2O_3, H_2O + H_2 = 2Fe_3O_4 + H_2O + 3H_2O$$

At the end of the process, the current of hydrogen is continued until the tube is cold. If exposed to the air whilst still hot, the pulverulent iron becomes red-hot from the rapid reabsorption of oxygen, and the product is spoiled.

[§ A fine greyish-black powder, strongly attracted by the magnet, and exhibiting metallic streaks when rubbed with firm pressure in a mortar. It dissolves in hydrochloric acid with the evolution of hydrogen.] This hydrogen should be odourless, that is, free from sulphuretted hydrogen, the evolution of which indicates the presence of a little sulphide. "As the hydrated peroxide of iron of the Pharmacopœia is made by precipitation from a solution of persulphate of iron with caustic soda, this, as produced by manufacturers, generally retains a small portion of sulphate, which is not completely washed out in the process, and this sulphate is afterwards reduced to sulphide by the hydrogen during the conversion of the oxide to reduced iron. The liability to such a result would be obviated if the oxide used in the process were directed to be obtained from chloride of iron by precipitation with ammonia."—Redwood.

Strong ignition of the oxide before use would also probably effect the same object.

[§ 10 grains added to an aqueous solution of 50 grains of iodine and 50 grains of iodide of potassium, and digested in a small flask at a gentle heat, leave not more than 5 grains undissolved, which should be entirely soluble in hydrochloric acid.] This residue unacted upon by the iodine is, of course, the oxide which is present, the metallic iron being removed in solution in the form of iodide.

Ferrum Tartaratum (see Ferri et Ammon. Cit. and Ferri et Quinæ Cit.).—The tartarated iron is generally recognizable by its deep colour and sweetish taste. The tests indicated in the Pharmacopœia are intended to show that it is free from ammonia, that it is made from cream of tartar, and that it contains a due proportion of iron, viz. 30 per cent. of the peroxide.

KOUMISS.

BY VICTOR JAGIELSKI, M.D.

(*Concluded from page 865.*)

The fermentation which milk undergoes by the process which converts it into koumiss, presents many differences from those changes induced in milk by the ordinary methods of souring and curdling it, such as exposure to air and heat, addition of acids or rennet, etc. In all these cases lactic acid is formed; but in the fermentation process for koumiss, that product is accompanied with other derivatives of the milk which impart a peculiar character, physical as well as chemical. This character not only distinguishes the fresh koumiss, but pushes it on, under the influence of time, into further changes, which are not common to milk under ordinary circumstances. According to With, Stahlberg, Hartier, and, more recently, Weinberg, koumiss is composed of *alcohol, lactic acid, sugar, finely divided caseine, fat, salts, carbonic acid and water.* This composition represents the mare's milk (koumiss) in its fresh or No. 1 state. After having been in bottle for from five to ten days, according to the temperature of the atmosphere, it has changed by progressive fermentation into koumiss No. 2. This latter differs chemically from the former in containing more alcohol and carbonic acid, but less of solid matters. At the same time, its external or physical character has perceptibly changed, for it is homogeneous when well shaken and sparkles like champagne. It is also more acidulous than sweet, owing to the development of traces of acetic acid. By further age it becomes spontaneously No. 3; and this modification not only contains all the elements of the koumiss Nos. 1 and 2, but more or less butyric acid, succinic acid, acetic acid, and glycerine in addition. The proportion of alcohol and carbonic acid, moreover, has largely risen at the expense of the solid constituents. This koumiss is also more acidulous and sparkling than even No. 2, and rushes through the top of the bottle as a rich foaming liquor. It will be observed, then, that the fermentation progresses with age, and also that the older a koumiss becomes, the higher rises its proportion of alcohol and carbonic acid, and the lower falls its amount of solid matters.

Cow's milk koumiss should be made to correspond in composition with that from mare's milk; nevertheless it is sometimes necessary to make different modifications to suit the varying exigencies of disease and personal idiosyncrasy. This, of course, requires a certain chemical knowledge and skill which will give thick koumiss, skimmed koumiss, whey koumiss, diabetic koumiss, medicated koumiss, or any other modification that may be desired.

According to Morfit, the koumiss No. 2, from cow's milk, contains traces in variable degree of certain fragrant compounds, to which it may owe its character of a delicious beverage. These, he supposes, are generated from the volatile elements of the fat under the influence of the fermenting action and of the strong gaseous pressure in the bottle. There are other original and suggestive views by this able chemist upon the relations of koumiss, and as they tend to confirm my own observations, I propose to make them the subject in part of a more scientific paper at some future leisure.

Mare's milk koumiss runs through the transition state of No. 2 much more quickly than the koumiss from cow's milk. It is also more acid in the No. 3 state, and preliminary to its decay assumes a bitter taste. This bitter taste differs from the slight bitter of No. 3, cow's milk koumiss, which is a pleasant peculiarity and not a sign of approaching decay. All the different numbers have the colour and appearance of milk, and it should be noted here, that the cow's milk koumiss is a most agreeable beverage throughout.

Koumiss, unlike milk, agrees well with the feeblest stomach; and the molecular condition of its butter and caseine, together with the presence of lactic acid and other aids to digestion, render it the type of assimilable nutriments.

The foregoing description applies equally to the mare's milk koumiss of the steppes and the cow's milk koumiss of this country, with the differences noted. This latter, or cow's milk koumiss, as made on the Continent, does not retain its soundness so long, and, moreover, is not so agreeable to the taste.

The next point in sequence is the physiological relations of koumiss: but to elucidate these would require more space than the limits of this paper allow. I will, however, embrace the general physiology of the subject in the remarks which I am about to make upon its therapeutics. Moreover, I have already discussed the special physiology of the several constituents of koumiss in my treatise of the last year.

The high reputation of koumiss on the Continent has been fully confirmed in my own private practice and that of my professional brethren who have used it. With its aid, I have been able to treat certain diseases with gratifying results to both patient and physician. Most remarkable benefit is obtained by its use in all those complaints arising from feeble digestion, whether caused by impoverishment of the gastric juice or catarrhal complications, in nervous irritation and in the different phases of dyspepsia. Although the general properties correspond throughout the three numbers, the chemical and physical modifications which make the differences between them, give to each, in addition, a special character, and by this character it is adapted for special cases. In like manner these special koumisses, which are designated severally as *thick, skimmed,* whey, and diabetes *koumiss*, are modifications prepared to suit particular diseases.

In commencing the koumiss treatment, the physician must judiciously consider the condition of his patient, and regulate the use of this remedy accordingly. If debility be so great that the patient must keep in bed, then the koumiss is to be given only in very small quantities at short intervals, that is, about an ounce every hour. In such case it is necessary, and indeed in all cases it will be better, to restrict the diet solely to this beverage for a period. The power of assimilation will improve gradually, and sometimes even rapidly, and as this improvement advances, so will the taste for koumiss increase, and enable the patient to drink all that is required for a wholesome nutrition.

In this connection it must be remembered that the koumiss not only contains all the plastic, *respiratory* and heat-giving elements of the body, but presents them in such a form that they are rapidly absorbed to renew the wasted tissues of the body. In this respect koumiss is notably distinguished from milk, which, in any other modification, is intolerable to many stomachs, even in small quantities. When the patient is drinking the second quart of koumiss per day, his increase of flesh and strength will be very perceptible. I have had cases in which the gain amounted to as much as ten pounds in a month, where the only food taken with the koumiss was dry bread. Every quart that is drunk carries into the body about four ounces of solid food, so that koumiss supplies every rational want. Of course invalids in lesser degree, and those who go about actively, may drink according to their appetite, even though they consume as much as a gallon per day.

Patients in the adynamic stage of febrile disease regain wonderfully appetite and strength, and recover from stupor; their dry, black tongue clears up by perceptible gradations daily, the nervous tremor subsides promptly, the respiration becomes free, and the diuresis augments. This shows how thorough is the digestibility of koumiss, and how great is the restorative power of its elements. It is because the entire nutriment of the original milk is presented in those forms which greatly facilitate the natural action of the enfeebled organs of digestion; in other words, chemical skill has done in the preparation of koumiss nearly all the preliminary work which would otherwise fall on the digestive organs.

As has been noted already, koumiss can be made of any consistence or composition; therefore, if the amount of caseine in the normal koumiss is too great for any individual case, it must be replaced by another of lesser richness in that element. Again, for example, feverish persons require a thin or whey koumiss. The physiological explanation of whey koumiss in this connection is, that it not only gives less plastic material, but is very rich in sugar and salts.

For stout people the internal qualities of the koumiss must be so adjusted as to exclude the nourishing tendency, and therefore whey koumiss is thus indicated. But if a fat person has any morbid condition, such as chronic bronchitis, the koumiss must be not only whey koumiss, but have the special action suited to that morbid condition. The No. 2, or in more severe cases, the No. 3 koumiss of whey have this special action by reason of their much greater proportien of lactic acid.

That exercise in open air, after each dose, augments the appetite for koumiss I have already stated; but it must be added, that the warmer the season the more rapid is the progress in the cure; for then the koumiss has the immediate effect of allaying thirst and exciting appetite.

Fresh or No. 1 koumiss is a mild aperient, and promotes the flow of bile;—it is indicated, therefore, in constipation, especially when the complexion is sallow and the conjunctiva yellowish. So beautifully does it clear the skin, that its effect in this respect is proverbial in Moscow as the 'koumiss complexion.'

No. 3 koumiss applies to chronic diarrhœa, relaxation of the mucous membranes, and to nervous debility; it is, therefore, well suited for bronchitis, winter cough, and consumption. In such cases it is a benignant friend which has no rival; for, though not a specific, it is always a great palliative, and oftentimes a means of cure. It is necessary, however, to be used under the advice of a physician, so that it may be associated with other treatment as might be thought expedient.

Diaphoresis appears to be greatly increased by koumiss in summer, but in the colder seasons diuresis is strongly marked, and sometimes both effects follow together, especially in dropsies without organic lesion.

The pulse at first shows no change, but when the koumiss has been taken for a few days, then during the hours which follow its ingestion, the frequency diminishes, but there is more softness and fulness of volume. From this it might be inferred that koumiss is contra-indicated in hæmorrhage; but such is not the case, for in fact the blood itself is modified so favourably in its plasticity, and the walls of the blood-vessels are so strengthened, that the tendency to bleeding becomes lessened.

Koumiss produces a general calmness of feeling, sometimes accompanied with slight drowsiness; and the continuous use of it in its normal state produces plumpness in degree greater as the emaciation has been more advanced. Experience has shown in this connection that the average gain of weight ranges from the minimum of one ounce to the maximum of ten ounces per day. The weight of the patient should therefore be taken at the commencement of the treatment, and from time to time afterwards in order to observe the effect. If, in ten days, there is no sign of an increase, then it is better to stop the koumiss.

In conclusion, No. 2 koumiss is neither aperient nor constipating, but in other respects is midway between Nos. 1 and 3. It may be substituted advantageously for other drinks at meals, as it has a very agreeable taste, and is a great promoter of digestion.

If it should be desired to impart an aperient property to either Nos. 2 or 3, it is only necessary to drink the latter with one-half of fresh milk. By this admixture, the milk also becomes very digestible.—*The Milk Journal.*

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

Part I.—On the Action of Hydrobromic Acid on Codeia.

BY C. R. A. WRIGHT, D.SC.

(*Concluded from page 868.*)

The third base is conveniently obtained, as hydrobromate, by treating codeia with three times its weight of 48 per cent. HBr for two hours on the water-bath, precipitating the product (diluted with water) by excess of carbonate of soda, collecting on filters, and well draining from the mother-liquors, and finally extracting with ether until scarcely anything more is taken up; care must be taken to have as little watery fluid as possible present, otherwise the insoluble substance forms a sort of lather on agitation from which the ether will not separate. The insoluble substance is then dissolved in the least possible quantity of weak hydrobromic acid and fractionally precipitated by cautious additon of stronger acid; the second precipitate is dissolved up in water, in which it is readily soluble, and a few drops of carbonate of soda solution added. The filtrate from this yields, with strong HBr, nearly white flakes, which are wholly void of crystalline character under the microscope. These remain solid at 100° if previously completely dried over SO_4H_2; but if warmed whilst moist, become a more or less coloured tar. Dried at 100°, the following numbers were obtained:—

0·3440 grm. gave 0·6810 CO_2 and 0·1740 H_2O.
0·3425 grm. gave 0·6685 CO and 0·1680 H_2O.
0·5615 grm. burnt with soda lime gave 0·1310 Pt.
0·3200 grm. boiled with NO_3H and $AgNO_3$ gave 0·1330 AgBr and 0·0315 Ag.

	Calculated	
C_{72}	864	54·03
H_{87}	87	5·44
N_4	56	3·50
O_{12}	192	12·01
Br_5	400	25·02
$C_{72}H_{83}BrN_4O_{12}, 4HBr$	1599	100·00

Found.

53·99	53·23		
5·61	5·45		
—	—	3·33	
—	—	—	24·97

Carbonate of soda throws down from the hydrobromate a nearly white precipitate, which rapidly darkens, and finally turns a deep green, nearly black. Dried at 100° rapidly, the product gave the following numbers, which fall below those required for the formula $C_{72}H_{83}BrN_4O_{12}$, but which agree with those required for a similar formula but containing more oxygen:—

0·3810 grm. gave 0·8460 CO_2 and 0·2080 H_2O.

0·4430 grm. boiled with $AgNO_3$ and NO_3H gave 0·059 AgBr.

	Calculated.		Found.	
C_{72}	864	60·89	60·56	
H_{83}	83	5·85	6·07	
Br	80	5·64	——	5·67
N_4	56	3·95		
O_{21}	336	23·67		
$C_{72}H_{83}BrN_4O_{12}+O_9$	1419	100·00		

It hence happens that the free base rapidly absorbs oxygen. In confirmation of this, 0·11 grm. of the hydrobromate treated with caustic potash and injected by a pipette into 15 cubic centims. of air over mercury absorbed 0·9 cubic centim. in the course of an hour, or 6 per cent. of the total volume of the air; the salts, however, when dry, may be kept without alteration, and only slowly darken by exposure to air when moist.

This welding together of four molecules is not wholly without parallel in the history of the opium alkaloids and their derivatives: thus opianic acid heated* furnishes a body containing four times as much carbon as the original acid; thus

$$4C_{10}H_{10}O_5 = H_2O + C_{40}H_{38}O_{19}.$$

The qualitative reactions of bromotetracodeia appear to be identical with those of bromo- and chlorocodide. The base itself, when freshly precipitated, is slightly soluble in water, being thrown down again by addition of strong brine; in ether and benzol it is almost insoluble, and in alcohol but sparingly soluble.

When crude bromotetracodeia, got by extraction with ether of the mixture of bases thrown down by carbonate of soda, is dissolved in weak hydrochloric acid, and precipitated twice or thrice by excess of stronger acid, nearly white flakes are ultimately obtained, resembling in all their physical properties the bromohydrobromate of tetracodeia. These flakes, however, contain no bromine, the absence of this element being ascertained by the negative results obtained on examining with chlorine-water and ether the acidified solutions of the lime-salts got by combustion with quicklime, and of the sodium-salts got by boiling with NO_3H and $AgNO_3$, and fusing with carbonate of soda the silver-salts thus got. Dried over SO_4H_2 and finally at 100°, this body gave numbers indicating a base of constitution analogous to that of bromotetracodeia; it may therefore be termed chlorotetracodeia.

Specimen A.—0·3880 grm. gave 0·1970 AgCl.
0·3645 grm. gave 0·8395 CO_2 and 0·2120 H_2O.
0·3940 grm. burnt with soda lime gave 0·1080 Pt.

Specimen B.—0·4460 grm. gave 1·0150 CO_2 and 0·2560 H_6O.
0·2350 grm. gave 0·1250 AgCl.

	Calculated.	
C_{72}	864	62·77
H_{97}	87	6·32
N_4	56	4·07
O_{12}	192	13·94
Cl_5	177·5	12·90
$C_{72}H_{83}ClN_4O_{12}4HCl$	1376·5	100·00

Found.

Specimen A.		Specimen B.	
62·81	——	62·07	
6·46		6·38	
——	3·90		
12·56	——	——	13·16

Specimen A had been three times precipitated by HCl in large excess, while specimen B had only been thrown down twice, and probably retained a trace of bromotetracodeia.

Specimen A converted into platinum-salt gave the following numbers after drying at 100°.

0·4215 grm. gave 0·0810 Pt = 19·22 per cent.

The formula $C_{72}H_{83}ClN_4O_{12}$, 4HCl, $2PtCl_4$ requires 19·18 per cent.

Like bromotetracodeia, the free base appears to absorb oxygen with avidity. Dried as rapidly as possible at 100°, the precipitate thrown down by carbonate of soda gave these numbers:—

0·3880 grm. gave 0·9190 CO_2 and 0·2230 H_2O.
0·3100 „ 0·0330 AgCl.

	Calculated.		Found.	
C_{72}	864	64·74	64·59	
H_{83}	83	6·22	6·38	
N_4	56	4·20		
$O_{18\frac{1}{2}}$	296	22·18	——	2·64
Cl.	35·5	2·66		
$C_{72}H_{83}ClN_4O_{12}+O_{6\frac{1}{2}}$	1334·5	100·00		

In all its physical and chemical properties chlorotetracodeia closely resembles bromotetracodeia: their qualitative reactions are identical; they have an intense bitter taste and apparently but slight physiological action, at any rate in small doses.

My thanks are due to Mr. J. L. Bell, in whose laboratory the above experiments were carried out.

* Matthiessen and Wright, Proc. Roy. Soc. xvii. p. 341.

YEAST AND OTHER FERMENTS.*

BY C. A. WATKINS.

In this paper I shall endeavour to lay before you some of those chemical changes which take place in certain substances when under the influence of other substances called Ferments. In some of these transformations the microscope shows us that there exists an intimate connection between the processes and the growth of some minute organisms, while in others the changes are purely chemical. The subject, which is of interest alike to the physiologist, microscopist and chemist, has received great attention from many excellent observers; nevertheless, very little is known about it, and at present the whole matter is involved in great mystery.

I therefore feel considerable diffidence in addressing you on such a subject, and should not have attempted it had I not observed that many writers fall into serious errors when discussing the chemical operations of the ferments.

I may at once tell you that the matter contained in this paper is perhaps more chemical than microscopical; but the fact is, these two investigations are inseparable if we desire accurate knowledge, and it is impossible to view ferments broadly, if treated only as a chemical or only as a microscopical subject.

Fermentation is a term applied to various chemical transformations, which certain ordinarily stable compounds, such as starch and sugar, undergo when in contact with a small quantity of an azotized or albuminous substance, which is itself in an active state of alteration. This active substance is called a ferment, and one of the peculiar properties of such a body is that it receives nothing from, nor imparts anything to the matter which is undergoing fermentation, but is itself decomposed and destroyed as a ferment in proportion to the matter fermented, which is gradually split up, or unfolded into two or more substances of simpler composition, sometimes with and sometimes without the assimilation of water.

This unfolding under the action of ferments is totally different to that chemical change known as catalysis, which takes place in one substance by mere contact with

* Reprinted from the 'Journal of the Quekett Microscopical Club.'

another, such as the unfolding of alcohol into ether and water by contact with sulphuric acid; for although the acid causes such a wonderful change, it is not destroyed by the operation, and consequently, when once the process is set going an unlimited quantity of alcohol may be converted by the original acid.

All the ferments are highly complex azotized substances allied to albumen; but while they possess this character in common, they may be divided into two groups—the one being living organisms, as yeast, and the other substances derived from various organic sources, such as albumen, gluten, casein, diastase, emulsin and a variety of others, all of which decay most rapidly when in a moist state.

The authors of the 'Microscopical Dictionary' would "exclude these substances from the ferments, and desire that the term fermentation be restricted to those changes which take place only through the agency of living organisms or fungi;" regarding which they also say, "A general law appears to prevail throughout the fungi that their nutrition differs from that of all other plants in depending exclusively on the absorption and decomposition (with the evolution of carbonic acid gas) of organic compounds, therefore consisting of the performance of the operation of fermentation on the organic matters on which they feed." But as the chemical operations of the ferments are so similar, notwithstanding the wide difference in their organization, I consider there would be no advantage in separating them as proposed, as they form a distinct class of chemical phenomena. I have also to observe that it is not true that carbonic acid gas is always given off during fermentation, nor is it proved that it is evolved during the growth of all the fungi. The ferments to which I desire to call your attention are—

Mycoderma vini, or yeast, which converts sugar into alcohol.

Boiled yeast, which converts sugar into gum and mannite—this transformation being called the viscous fermentation.

Casein, which converts sugar into lactic acid and butyric acid; this last conversion, however, being attributed to the action of the vibrio and diastase, which converts starch into sugar.

I shall have a few words to say on *M. aceti*, or the vinegar plant as some call it, which, although included by many among the ferments, is not so considered by chemists, for reasons I will hereafter explain.

When a saccharine solution is left in contact with casein either in the form of fresh curd or cheese, the sugar is slowly transformed into lactic acid according to the following equation:—

Cane sugar, $C_{12}H_{11}O_{11} + HO = 2C_6H_6O_6$ lactic acid.

In this fermentation water is assimilated, but no gas is evolved.

A solution of lactic acid, similarly treated, is transformed into butyric acid thus:—

$$\text{Lactic acid, } 2C_6H_6O_6 = \underset{\text{Butyric Acid.}}{C_8H_8O_4} + \underset{\text{Carbonic Acid.}}{4CO_2} + \underset{\text{Hydrogen.}}{4H.}$$

In this fermentation both carbonic acid and hydrogen gases are evolved. It is a question not yet answered, whether these chemical changes are induced by mere contact with the decomposing casein which is regarded as the ferment, or whether the minute organisms developed in these solutions are the real ferments living on the matters therein. One thing is certain, that in both fermentations living organisms abound, and they cannot grow without chemical changes taking place.

"M. Pasteur considers that a specific ferment is concerned in the production of the lactic acid fermentation, which spreads itself out as a grey substance over the surface of the sediment; and he asserts that this organism, when once obtained, and a small quantity added to a solution of sugar, very rapidly converts it into lactic acid, provided the solution contain a small quantity of some nitrogenous substance. When this grey matter is examined by the microscope it is seen to consist of very small globules or very short articulations, either isolated or in threads, much smaller than yeast, and to exhibit very rapid gyratory motion."

I have not succeeded in obtaining this grey matter, but as the lactic acid fermentation goes on very slowly, and as this season of the year is not favourable for experiments on fermentation, it may not have had time to make its appearance.

In order to observe the organisms which accompany the transformations of sugar, I watched the progress of the lactic acid fermentation of cane sugar, that of milk sugar by the gradual decomposition of milk, and also the viscous fermentation of cane sugar; for although I have seen no notice of any living organism being concerned in this fermentation, I thought it likely that the viscid ropy matter which is formed therein was probably due to some organic growth.

Now in all these experiments I found that as soon as decomposition commenced, or at least was appreciable, but not until then, organic life was found in all the fluids; that in all cases they appeared on the surface before they were seen in the body of the fluid, and that when first discovered they were not in an active condition, but as the decomposition progressed they became so, and moved through the fluid with rapidity, but those at the surface continued to be the most active. These bodies are species of *Vibrio* and *Bacterium*.

The milk used in the experiments was obtained perfectly fresh and divided into three portions—one containing the cream after the milk had stood twenty-four hours, the second was simply the skimmed milk, while the third portion was some of the same, with the addition of chalk to neutralize the lactic acid as it was formed. During four days the milk remained sweet, and I detected no organism in any part of it; but at the end of the fourth day the cream had a sour odour, indicating that lactic acid had been formed, and a small speck taken from the surface with a needle exhibited a mass of Bacterium-like bodies which, when some distilled water was passed between the glass slide and cover, swarmed through the fluid with rapid and various capers.* On the fifth day the milk had become sour, and exhibited the same active organs, but in the portion to which the chalk was added they were neither so numerous nor so active. On the eighth day fungus spores and mycelia appeared on the surface of the cream, and the same was noticed, but in a lesser degree, some days afterwards on the two portions of milk; but as a considerable amount of lactic acid was formed before these objects made their appearance, I do not imagine they were concerned in the fermentation which was going on.

But it was in the mixture of boiled yeast and sugar solution to produce the viscous fermentation that I found these bodies developed most rapidly, for in twenty-four hours after the mixture was made the fluid was covered with a thin film, which proved to be entirely these organisms packed closely together, so that no motion could be seen until some distilled water was added, when their activity was fully displayed. In the course of a few days the film had become a thick viscid scum, consisting entirely of these minute bodies, without a sign of any fungoid growth.

From the fact that these organisms grow most rapidly, and are in the greatest activity at the surface, it appears that air is necessary to produce these results, for in the mixture of milk and chalk from which carbonic acid was given off as the lactate of lime was formed, they were always in smaller quantity and less active condition: this vessel, too, was covered with a plate of glass, while all the other solutions were covered with paper.

(*To be continued.*)

* The motion here referred to is not due to the currents produced by capillary attraction, evaporation, etc.

The Pharmaceutical Journal.

SATURDAY, MAY 6, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed* "*Pharm. Journ.*"

CHEMICAL NOMENCLATURE IN PHARMACY.

HAVING but recently urged on our readers the necessity of improving the character of the monthly Evening Meetings of the Society, it was with great pleasure we witnessed Professor ATTFIELD'S endeavour to give practical effect to our suggestions, and we therefore desire to express our thanks to him for having so promptly taken the matter in hand, as well as our hearty congratulations on the very successful issue of his exertions. We doubt not that all members of the Society, and especially all attendants at the Evening Meetings, will participate with us in these feelings, while hoping that in the ensuing season there may be a succession of papers brought forward as interesting and useful as that to which we refer.

It is satisfactory to find that Professor ATTFIELD'S suggestions for the revision of the chemical nomenclature of our Pharmacopœia do not involve any violent changes, but that, while seeking to attain uniformity consistent with chemical science, those suggestions are conservative in their tendency, and influenced by the sound principle that for medical and pharmaceutical purposes it is more important that names should denote things rather than our ideas as to the nature or constitution of those things. Moreover, the simplicity of the plan by which uniformity is to be attained in the designation of chemicals in pharmacy is so great as to constitute a strong argument in favour of Professor ATTFIELD'S proposals being generally adopted, and on this ground alone we are not surprised to find they have met with general approval both by the medical men and chemists who took part in the discussion and by the medical press. The few points in regard to which there were differences of opinion were only of minor importance, and would probably be settled without difficulty by having regard to the essential requisites of a name for medical and pharmaceutic purposes, and by making the possession of chemical propriety subordinate to them.

We should be glad to see the main features of Professor ATTFIELD'S plan adopted, not only in the British Pharmacopœia, but also in that of the United States, as well as the Pharmacopœias of Europe, so as to secure the very great advantage of a permanent and uniform nomenclature.

PHARMACY IN AMERICA.

THE School of Pharmacy in connection with the College of Pharmacy at Chicago, which was reorganized last October, has had a prosperous session under the new faculty, Professors BLANEY, BARTLETT and HAMBRIGHT. The class numbered thirty, of whom one was a lady.

The Annual Meeting of the College was held on the 15th March. Mr. E. H. SARGENT, in an address delivered upon vacating the presidential chair, urged upon the members the advisability of co-operating with the officers in obtaining employment for students coming from a distance, and also of enabling the "clerks" in their employ to attend the lectures. In reference to the system of instruction, he suggested that in future years it would be advisable to give a course of lectures to the junior class separate from the senior. Such a system, he thought, would possess greater thoroughness, and the subjects would be presented in better order. It seemed to him plain that if the lectures were adapted to the senior class they could not be suited to the junior, and if suitable to the junior class they were unfit for the senior. This plan would be attended with more labour and demand a greater sacrifice of time by the teachers, but the advantage to the taught would, in his opinion, be sufficient to warrant both. The publication of the *Pharmacist* had been continued, and it had proved a valuable auxiliary to the College. Its success, both in a scientific and pecuniary view, has been very encouraging. The growing importance of the varied interests of the College are such as necessitate the provision of a permanent home for the institution, and a committee has been appointed for the purpose of considering and reporting upon the subject. The following are the names of the officers for the ensuing year:—President, E. H. SARGENT; Vice-Presidents, JOHN W. EHRMAN and E. T. SCHLOETZER; Treasurer, A. C. VANDENBURGH; Secretaries, G. M. HAMBRIGHT and ALBERT E. EBERT. Mr. JOSEPH INCE and Mr. C. R. C. TICHBORNE have been elected honorary members of this College.

The Philadelphia College of Pharmacy commenced its fiftieth session on March 15, when the degree of "graduate in pharmacy" was conferred upon sixty-nine persons who had passed their examination. The Board of Examiners reported that they have found it advisable to change the examination for the diploma from a verbal to a written one. The entire number of candidates are accommodated in two rooms at separate desks, so as not to communicate with each other; a professor attending in each room to reply to proper queries. One branch is considered each day, and as soon as a student announces that he has completed his task, he is shown ten specimens relating to the particular branch under consideration, the names of which he has, according to his judgment, to write down, so that the answers of each student to all queries and specimens are recorded.

At the Annual Meeting the Committee appointed to select a suitable person for Editor of the *American Journal of Pharmacy* reported that they had agreed to recommend Professor JOHN M. MAISCH for that office. The business of the journal is now conducted at the College, where all correspondence is to be sent. A balance of 1424 dollars in favour of the Journal was announced in the Treasurer's report. The officers chosen by this Society for the ensuing year are—President, DILLWYN PARRISH; Vice-Presidents, W. PROCTER, jun., and ROBERT SHOEMAKER; Treasurer, AMBROSE SMITH; Secretaries, C. BULLOCK and ALFRED B. TAYLOR.

The Maryland College of Pharmacy commenced its nineteenth annual session on the evening of the 10th of March. The Act of Incorporation, empowering the Society to confer the degree of Doctor in Pharmacy upon suitable persons, having been read, that title was awarded to Professor WILLIAM PROCTER, Professor JOHN MAISCH and Professor ISRAEL J. GRAHAME, of Philadelphia, and Professor DAVID M. STEWART, M.D., of Delaware. A list of nine persons who had successfully passed their examination was read, and the degree of Graduate of Pharmacy was publicly conferred upon them by the President. The evening's proceedings concluded with an address to the students by Professor CLAUDE BAXLEY, M.D. As in the case of the Philadelphia College, the examinations at the Maryland College are conducted in writing. It is expected that the Act passed last year by the General Assembly of Maryland for the regulation of the practice of pharmacy in the city of Baltimore, will greatly increase the welfare and influence of this College.

The Annual Meeting of the College of Pharmacy of the City of New York was held on March 16. Ten diplomas of Graduate in Pharmacy were conferred upon members of the graduating class and two prizes of fifty dollars each were presented, one to the student passing the best general examination, and the other to the student passing the best examination in botany and materia medica. At a meeting of the students, called for the purpose, resolutions were passed thanking the Professors and other officials for the manner in which the classes had been conducted, and urging other pharmaceutical students to avail themselves of the opportunities for instruction afforded by this College. The officers elected to serve during the ensuing year are,—President, W. HEGEMAN; Vice-Presidents, T. FROHWEIN, J. CODDINGTON and W. NEERGAARD; Treasurer, W. WRIGHT, jun.; Secretary, EDWARD L. MILHAN.

With respect to legislation affecting pharmacy, we may say that the Ontario Act* has now become law. The New York Drug Clerk Bill† has been somewhat modified: the board of examiners, which it was originally proposed should consist of six, being reduced to four members, viz. one skilled pharmaceutist, one practical druggist and two physicians, who are to be appointed by and hold office during the pleasure of the mayor of New York. The salary is to be not more than 2500 dollars per annum for each commissioner, and the secretary, who is to be a practical druggist elected by the board: the amount to be fixed by the Board of Supervisors of New York. Any deficiency that may exist after the payment of the expenses of the Act out of the fees received is to be raised by a tax on real and personal property in the city of New York.

A Bill to appoint an examiner of drugs in Pennsylvania is now before the Legislature of that State. At the Annual Meeting of the Philadelphia College of Pharmacy, a committee was appointed to examine this Bill, and to take steps to prevent its becoming law if found to be objectionable.

* *Ante*, pp. 752 and 772. † *Ante*, p. 772.

A COURSE of eight lectures upon Economic Botany, with especial reference to Vegetable Substances used for Food, will be delivered by Professor BENTLEY, in the Museum in the Royal Botanic Society's Gardens, Regent's Park, commencing on Friday, May 12th. They will be open to Fellows and Members of the Society, and to bearers of ivory tickets, or the ordinary orders of admission to the gardens.

AT the Annual Meeting of the Royal Institution, on Monday last, the following gentlemen were unanimously elected as officers for the ensuing year:—President, Sir HENRY HOLLAND, Bart., M.D., D.C.L., F.R.S.; Treasurer, WILLIAM SPOTTISWOODE, M.A., F.R.S.; Secretary, HENRY BENCE JONES, M.A., M.D., D.C.L., F.R.S.

ARRANGEMENTS have been made in York for opening a school for instruction in Pharmaceutical Science, under the superintendence of W. PROCTER, M.D., F.C.S. The Summer Course of Lectures, commencing on Friday, May 5, will be continued weekly through May, June and July, and the Winter Session, will extend from October to March. Fees for both Sessions (to Pupils or Assistants of Subscribers), one guinea, which may be paid to the Honorary Treasurer, Mr. T. COOPER.

THE collection at the Twickenham Economic Museum, which had been got together by Mr. THOMAS TWINING, at considerable trouble and expense, for the purpose of illustrating the various branches of domestic economy, has, we regret to say, been destroyed by a fire that originated in one of the cellars.

OUR readers will find in the correspondence columns a letter from Mr. BOTTLE, having reference to the qualities of the paper now in general use, which is well worthy of perusal.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1870-71.

	Committees held once a Month or oftener.			Committees held Occasionally.					Special Committees appointed to draw up Reports, etc.	Total Number of Attendances.
	Finance.	Publication of Council Minutes.	Library, Museum, and Laboratory.	House.	Benevolent Fund.	Parliamentary.	Provincial Education.	General.		
No. of Committee Meetings held.	12	12	13	12	7	6	5	This Committee did not meet during the Year.	13	
Abraham (*Liverpool*)	3	*	5	*	3	2	*		1	14
Atherton (*Nottingham*)	*	*	*	*	*	3	4		1	8
Bottle (*Dover*)	6	*	*	*	4	*	*		2	12
Bourdas (*London*)	11	*	13	12	7	5	*		2	50
Brown (*Manchester*)	*	*	*	*	*	1	*		1	2
Carr ‡ (*London*)	4	*	*	3	2	1	*		1	11‡
Deane (*London*)	*	*	*	3	*	*	*		1	4
Dymond (*Birmingham*)	10	*	*	*	5	*	3		8	26
Edwards (*Dartford*)	*	12	0	1	*	1	*		1	15
Evans (*London*)	3	*	*	*	1	2	*		0	6
Groves (*Weymouth*)	*	*	8	*	*	*	3		4	15
Haselden (*London*)	10	12	11	6	6	4	3		7	59
Hills (*London*)	*	*	12	8	*	2	*		2	24
Mackay (*Edinburgh*)	*	*	1	*	*	1	2		2	6
Reynolds (*Leeds*)	*	*	3	*	*	*	3		2	8
Sandford (*London*)	2	12	8	11	0	4	3		9	49
Savage (*Brighton*)	*	*	*	*	*	3	*		0	3
Stoddart (*Bristol*)	4	*	*	*	4	*	2		1	11
Sutton (*Norwich*)	*	*	1	*	*	*	2		3	6
Williams † (*London*)	*	*	7	3	*	3	2		5	20†
Woolley (*Manchester*)	*	*	4	*	*	*	4		1	9
Brady † (*Newcastle*)	*	*	3	*	*	*	2		0	5
Hanbury ‡ (*London*)	4	*	*	5	2	2	*		0	13‡

* Not appointed on this Committee.
† Mr. Brady resigned November, 1870; Mr. Williams elected December, 1870.
‡ Mr. Hanbury resigned December, 1870; Mr. Carr elected January, 1871.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1870–71.

Abraham, John	7	Edwards, George	8	Savage, William Dawson	11
Atherton, John Henry	9	Evans, Henry Sugden	9	Stoddart, William Walter	9
Bottle, Alexander	11	Groves, Thomas B.	9	Sutton, Francis	8
Bourdas, Isaiah	11	Haselden, Adolphus F.	12	Williams,† John	5
Brown, William Scott	5	Hills, Thomas Hyde	12	Woolley, George Stephen	8
Carr,* John	4	Mackay, John	4		
Deane, Henry	7	Reynolds, Richard	6	Brady, Henry B.†	4
Dymond, George	11	Sandford, George Webb	11	Hanbury,* Cornelius	3

ANALYSIS OF EXAMINATIONS.—ENGLAND AND WALES.—1870.

Number of Meetings of the Board 22

	Total number of Candidates during the year.	Total number of Candidates rejected during the year.	Total number of Examinations during the year.	Average number of Candidates at each meeting.	Average number of rejections at each meeting.	Per cent. of Failures.
Major	75	18	11	6·81	1·63	24
Minor	258	81	13	19·84	5·78	31
Preliminary	741	221	4	185·25	55·25	30
Modified	349	117	9	38·77	13·00	33·5

ANALYSIS OF EXAMINATIONS.—SCOTLAND.—1870.

	Total number of Candidates during the year.	Total number of Candidates rejected during the year.	Total number of Examinations during the year.	Average number of Candidates at each meeting.	Average number of rejections at each meeting.	Per cent. of failures.
Major	6	0	4	1·5	0	0
Minor	31	9	7	4·4	1·28	29
Preliminary	62	13	7	8·85	1·85	20·96
Modified	44	8	7	6·28	1·14	18·18

REGISTRAR'S REPORT AS TO MEMBERS, ASSOCIATES AND APPRENTICES SUBSCRIBING TO THE SOCIETY FOR THE YEAR ENDING 31st DECEMBER, 1870.

Members—Pharmaceutical Chemists.

Number of Members, 1869	1783
” ” restored, etc., 1870	13
” ” elected, etc., 1870	81
” ” changed from "Chemist and Druggist" to "Pharmaceutical Chemist"	3
	1880
Deaths, Seceders, etc. (see particulars below)	78
Total number of Members, December 31st, 1870	1802

Increase 19

Deaths, Seceders, etc. :—

Deaths	39
Retired (out of business)	21
Resigned	1
Medical	3
Gone away	1
No Notice	13
	78

Members—Chemists and Druggists.

Number of Members, 1869	403
” ” elected, 1870	189
	592
Deaths, Seceders, etc. (see particulars below)	10
Total number of Members, December 31st, 1870	582

Increase 179

Deaths, Seceders, etc. :—

Deaths	2
Now Pharmaceutical Chemists	3
Gone away	2
No Notice (1 a Lunatic)	2
Erased from Register	1
	10

Associates in Business.

Number of Associates in Business, 1869	22
” ” ” elected, 1870	61
	83
Seceder (no notice)	1
Total number of Associates in Business, December 31st, 1870	82

Increase 60

Associates, Major and Minor, not in Business.

1870.	1869.	Increase.
431	288	170
27		
458		

Apprentices.

1870.	1869.	Increase.
564	499	65

* Mr. Hanbury resigned December, 1870; Mr. Carr elected January, 1871.
† Mr. Brady resigned November, 1870; Mr. Williams elected December, 1870.

PHARMACEUTICAL SOCIETY, EDINBURGH.

The last Scientific Meeting of the North British Branch took place in St. George's Hall, on Monday evening, 24th April, at half past eight o'clock; Mr. AITKEN, President, in the chair.

Mr. PATON, Assistant-Keeper in the Industrial Museum, was introduced by the President and read a paper, "On the History of Oriental Spices."

The paper was illustrated by coloured drawings and specimens. It will be printed in a future number.

A vote of thanks to Mr. Paton for his interesting communication was proposed by Mr. YOUNG, seconded by Mr. LEITCH, and carried with acclamation.

The PRESIDENT then proceeded to give his Valedictory Address:—

Gentlemen,—We are now come to the close of the last meeting of another session, and I think we may congratulate ourselves on this being in all respects the best attended, the most agreeable, and fully as instructive as any of former years.

During the past session we have had various and valuable papers on scientific subjects from gentlemen of the highest standing in science and the arts.

In November last Dr. Stevenson Macadam favoured us with an able paper on Fermentation. In the course of this lecture, after having referred to the old theory, the lecturer introduced the more recent improvements of Dr. Tyndall, Monsieur Pasteur and Dr. Angus Smith. Dr. Macadam, in his usual happy manner, illustrated these with many diagrams and tables.

At our next meeting, which took place in the Masonic Hall on the evening of the 23rd January, Dr. Balfour, Professor of Botany in the University, very kindly gave a lecture on Ipecacuanha-root and its Cultivation in the Royal Botanic Gardens here. The Professor had a large and an attentive audience. This lecture, most ably delivered, was illustrated by many specimens, diagrams and a number of living plants, together with a large collection of drawings, beautifully painted from nature by Mrs. Balfour.

Again, in February we had a very popular lecture from Professor Archer, of the Museum of Science and Art, the subject being the History and Properties of Isinglass and Allied Substances, with the manner in which it is procured, prepared and used. Specimens of the air-bladders of fishes in the different forms in which they are dried for preservation and use were shown in illustration.

After making a few observations on some of the peculiarities and fondness of the Chinese, Japanese and other Oriental nations for gelatinous substances similar to isinglass, the Professor concluded by stating the great difficulty and expense incurred in procuring such forms as these, and specially mentioned the fabulous prices given for edible birds'-nests, etc.

Our fourth scientific meeting, on the evening of the 22nd February, was enhanced by a paper on a discovery of Priestley, given by James Dewar, Esq., F.R.S.E. & F.C.S. This lecture was exceedingly well illustrated by several practical experiments and was much applauded throughout.

Mr. Dewar, having given an interesting account of the successive experiments made by Joseph Priestley in 1772 in connection with fixed air, how produced and its effects on vegetable life, traced the discoveries subsequently made by scientific inquirers into the connection betwixt light and the life of plants. A few beautiful specimens of these were exhibited, and the lecture brought to a termination by Mr. Dewar promising at some future time to favour us with another paper on some popular subject connected with our profession.

Then again to-night, being the winding-up of the business of this session, we have been earnest listeners to the very admirable paper 'On the History of Oriental Spices' from Mr. Paton, Assistant-Keeper, Edinburgh Museum of Science and Art. The excellence of this example of Mr. Paton's researches on the subject, and the able and fluent manner in which it has been illustrated and brought before us, has already drawn from you unmistakable evidence of the pleasure afforded,—I think also of your desire to hear him again; and I have no doubt, should the learned gentleman see his way to favour us with a like paper next session, the obligation will be acknowledged and appreciated by every one of us.

I am glad to say, gentlemen, that the large number of candidates presenting themselves for examination, and who have been successful in passing during this session, testify most clearly to their careful attention and study. The proficiency in many cases being so decidedly marked, manifested on their part an anxiety to get through creditably and with honour.

I might here, gentlemen, take some notice of the *quæstio vexata*, which is causing such a sensation at the present time amongst the members of the drug trade. Both sides, however, being so ably championed, and the feelings of each so well ventilated in the PHARMACEUTICAL JOURNAL, and also in the *Chemist and Druggist*, I think it advisable to leave this alone, seeing that to-night we have so little time for any discussion upon the subject. At the same time, my own conviction is, should legislative enactments be necessary for enforcing compulsory poison regulations on us, they ought certainly not to be one-sided, but include surgeon-druggists as well, and all others who sell or dispense poisons in any shape whatever. In the establishments of this city the greatest care is taken to secure the public from danger; and while we are all anxious and willing to make such arrangements, and use such precautions and safeguards as suit our own places of business, with every satisfaction to our customers, I cannot see that any Legislative Council whatever has the right to burden us with their enactments, unless with the full consent of those so deeply concerned.

You will have observed a very modest intimation of some six or eight words at the bottom of the billet calling this meeting. It simply states that subscriptions to the Benevolent Fund are earnestly requested. You are all well aware that in every large community many do fall somehow into difficulties; it may be through some severe dispensation of Providence, or it may have been their own imprudence, or their want of sufficient care, attention and energy in conducting their business. In whatever way this has happened, they are kept down by the heavy hand of misfortune and poverty, rarely able to get up again. It is to such as these the Benevolent Fund brings relief, and it has been the means of making the widow's heart sing for joy, and it has brought, in many cases, some degree of comfort and happiness to many a poor and desolate fireside. We are commanded to remember the poor, the surety is unquestionable: For he that giveth to the poor, lendeth to the Lord.

And now, gentlemen, before retiring from the position of president, to which you so kindly elected me, and having enjoyed the honour for three successive sessions, may I venture to express the hope that the duties of the chair have been conducted to your satisfaction.

I would wish also to tender my sincere thanks to those gentlemen who have evinced such an interest in our meetings, and have ever readily and handsomely come forward and given us so many valuable papers, lectures and communications on scientific subjects.

And to all of you, gentlemen, my sincere acknowledgments are due for your continued good will and courtesy on every occasion of our meeting together. I trust a large measure of like kindness may be accorded to my successor, Mr. Baildon, a gentleman well known to all of you, of the highest standing as a pharmacist, and one of the oldest members of this Society in Scotland.

As to the younger brethren, and those who have already passed or are about to pass their first examination, I would just say, having made a good beginning, see that you do not fall back or lag behind. Be up and doing; never rest content with the appearance merely, but acquire knowledge on every subject, and more particularly on that connected with your profession, for such as it is you will be compelled, in all probability, to rest upon it your whole dependence in after life. Bear in mind that

"In youth's gay season of delight,
When all around is fresh and fair,
We think not of its rapid flight,
It costs us not a single care.
But grey hairs come, and wrinkles too,
And many a thought that makes us sad;
Ah! then we think how fast they flow,
Those few short years when we were glad."

In conclusion, gentlemen, as intelligent members of this Association, we ought to have, as it were, one mind and one heart—a heart beating in unison with each other, and diffusing with every pulse life and health and joy to the remotest member of the Society. Some of you make a beginning, and come forward next session with a will and in earnest. Give an essay or a lecture on some subject bearing upon ourselves, or on the business with which we are connected, or on the Society we have all so much at heart. There are not a few young men in this hall to-night perfectly able, and I trust not unwilling, to lend a helping hand to keep up and sustain the dignity, the prosperity and the high standing of the North British Branch of the Pharmaceutical Society.

At the close of this address, Mr. Ainslie moved a vote of thanks to Mr. Aitken for his services as President to the Society. This was seconded by Mr. Young, and carried amidst hearty applause.

At this stage of the proceedings, visitors and others were requested to withdraw, the members of the Society remaining to take part in the Annual Meeting.

The Secretary then read the

Annual Report.

The Council, at the close of another session, beg to congratulate the members of the Society on the continued progress of pharmaceutical education.

It must be evident to those interested that the compulsory power obtained under the recent Act of 1868 is already bearing good fruit, and that the taunt of want of proper culture in the chemist and druggist as appertaining to his daily walk and avocation is fast becoming a thing of the past. This is not only highly satisfactory, but is also very encouraging. Long and arduous has been the struggle; for while the privileges vested in the Society by the Bill of 1852 left the matter of examination only optional, it was felt that the very establishment of Boards of Examiners in London and Edinburgh was in reality paving the way for the more compulsory powers which were obtained in our last Act of Parliament.

It is true that the Bill of 1868 was far from being perfect, mixed up as it was with poison schedules, yet its existence gave both position and power, which the Society had vainly struggled for many years to acquire. Government recognition, with a definite organization, has, however, now placed the affairs of our Society on such a firm basis that it only requires we should be true to ourselves to enable us to emerge from the gloom and confusion by which we were formerly surrounded.

A glance at the Journal from time to time shows very plainly how many candidates present themselves for the various examinations. In London especially the numbers are considerable. During 1870, those coming before the Edinburgh Board were—Major 6, Minor 31, Preliminary 62, Modified 44; total 143. Of these there were rejected 9 Minor, 13 Preliminary, 8 Modified, or roughly an average of 20 per cent. spread over the whole. In connection with the rejections, it is a satisfactory thing to note that many of those candidates who fail, and come again before the Board for re-examination, admit that it was a benefit to be sent back to their studies, as it compelled them to become thoroughly acquainted with the various departments in which they had been found deficient.

The Council cannot avoid at this time expressing their satisfaction that the very vexed question of compelling chemists and druggists to adopt certain precautions for keeping, storing and selling poisons has been settled and arranged. It is freely admitted that it is most desirable all due precautions ought at all times to be taken in keeping and dispensing highly dangerous articles; and while they conceive that in most places of business such care is already exercised and in full operation, they can scarcely admit the propriety of compulsory measures in connection with this departmant of a chemist's ordinary business, believing as they do that in all probability such an enactment would have led to the appointment of an inspector or other Government official. The recent vote at one of the Council meetings has set the matter at rest, and the members here very heartily concur in the resolution that certain poison regulations be very earnestly recommended for general adoption.

The Museum of the Society in Edinburgh has been enriched by a very handsome contribution from Mr. Ransom, of Hitchin, in the form of a series of carefully and beautifully prepared and mounted specimens of many of the medicinal plants, and for which the Council feel the Society is much indebted to the donor. A few other specimens have been added during the year, but additional contributions will be gladly received.

The Library continues to be supplied with volumes from time to time, and arrangements have now been in operation for a considerable period by which books can be had at any time by applying to the Curator.

As St. George's Hall, which has now been so long used as a place of meeting, will be required for other purposes, steps are being taken to obtain suitable accommodation for Museum, Library, Examinations and place of meeting. Due notice will be given to those interested when the matter has been arranged.

The Council think it due to Professor Balfour and to Dr. Stevenson Macadam, who have so kindly lent their assistance in enabling students in pharmacy to attend their lectures on botany and chemistry, and trust that as the same liberality continues to be exercised pupils will evince an appreciation of the kindness shown by those gentlemen, by taking the opportunities now placed within their power of gaining instruction in such important branches of pharmaceutical education.

The Council cannot conclude without tendering their thanks to those who have contributed during the past session to render the scientific meetings so interesting and instructive. The attendance throughout has been very gratifying, and it is confidently hoped in succeeding sessions that the Society may continue to record the kind assistance of their friends and others in keeping up the character and increasing the number of these meetings, which are now recognized as being so useful and instructive.

After some remarks by Mr. Mackenzie and others, various explanations were given by the Secretary, when the adoption of the Report was formally moved by Mr. Anderson, of Musselburgh, seconded by Mr. W. Gilmour, and carried unanimously.

The following office-bearers, for 1871–72 were then severally proposed and unanimously elected:—

President: Mr. H. C. Baildon, 73, Princess Street.

Vice-President: Mr. Buchanan, 52, North Bridge.

Council: The President and Vice-President; Messrs. W. Ainslie, W. Aitken, D. R. Brown, G. Blanshard, J. Gardner, W. Gilmour, Kemp (Portobello), W. Noble, R. Raimes, J. R. Young, J. Mackenzie, Kinninmont, Davison and Fraser (Glasgow), with the President and Vice-President in London *ex officiis.*

Board of Examiners: The following gentlemen were proposed as members of the Board:—Messrs. H. C. Baildon, W. Aitken, D. R. Brown, J. R. Young, J. Buchanan, W. Ainslie, D. Kemp, W. Gilmour.

Secretary: Mr. John Mackay.

Library and Museum Committee: President and Vice-President; Messrs. Aitken, D. R. Brown and Mackay; Mr. D. R. Brown to be Convener.

Curator of Museum: Mr. Paton.

Honorary Secretary: Mr. John Mackay.

At the close of the meeting a very special vote of thanks was proposed by Mr. Young to Mr. Mackay for all the labour and trouble he had taken during the past year as Honorary Secretary to the Society in Edinburgh: this was seconded by Mr. Gilmore, and was enthusiastically carried.

Mr. Mackay shortly replied, and the proceedings were brought to a close.

The Annual Supper of the North British Branch of the Pharmaceutical Society of Great Britain was held in the Café Royal Hotel. There were upwards of a hundred gentlemen present. The chair was occupied by Mr. H. C. Baildon, who was supported on the right by Professor T. C. Archer, Dr. Angus Macdonald, Dr. Sidey, Mr. Davidson (Glasgow), Mr. Paton of the Industrial Museum, Mr. D. R. Brown and Mr. Ainslie; and on the left by Dr. Peel Ritchie, Mr. Aitken, Mr. Kinninmont (Glasgow), Mr. George Blanshard and Mr. D. Kemp (Portobello).

The croupiers were Messrs. Buchanan and Mackay. They were supported by Messrs. J. R. Young, Gilmour, Leitch, Noble, James Aitken, Nisbet (Portobello), Connacher (of Markinch), and Dodwell (of London).

After the usual loyal and complimentary toasts, the Chairman, in proposing "The Pharmaceutical Society of Great Britain," congratulated the company on the progress that had been made since the Society was instituted by Mr. Jacob Bell. The position the Society had taken up was now impregnable,—everything showing that it was prospering and likely to prosper. Among the other toasts were, "The President and Council in London and Mr. Mackay," by Mr. Aitken; "The Honorary Members of the Society, and Professor Archer," by Mr. Buchanan; "The Royal College of Physicians and Surgeons and Dr. Angus Macdonald," by Mr. Leitch; "The Secretary, Mr. Mackay," by Mr. Baildon; "Friends from a distance," by Mr. Ainslie; "The Chairman," by Mr. Kemp; "The Croupiers," by Mr. Young. A number of songs and recitations were given in the course of the evening.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. Albert Ager has been appointed Dispenser to the Surrey Dispensary, in the room of the late Mr. Nathaniel Staddon, who held the office for forty-five years.

MEETINGS FOR THE ENSUING WEEK.

Tuesday May 9. ......*Royal Institution*, at 3 P.M.—"On Force and Energy." By Mr. C. Brooke.
Royal Medical and Chirurgical Society, at 8.30 P.M.
Photographic Society, at 8 P.M.

Wednesday May 10. ...*Society of Arts*, at 8 P.M.—"The Application of Steam to Canals." By G. E. Harding, C.E.
Microscopical Society, at 8 P.M.

Thursday May 11. ......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"On Sound." By Professor Tyndall.

Friday May 12. ....*Royal Institution*, at 9 P.M.
Royal Botanic Society.—"Economic Botany." By Professor Bentley.
Quekett Club, at 8 P.M.

Saturday ......*Royal Botanic Society*, at 3.45 P.M.

Parliamentary and Law Proceedings.

POISONING OF THREE CHILDREN BY CARBOLIC ACID.

An inquest was held last week in the Manchester workhouse, at Crumpsall, upon the bodies of three girls who had died in consequence of having carbolic acid administered to them in the place of a cough mixture.

Mr. Richard Wharf, the master of the workhouse, said there was a cupboard in the workhouse that was under the sole charge of Miss Lees, the assistant-schoolmistress, in which medicine and other stores were usually kept, and also carbolic acid, for use as a disinfectant. He could not say whether any caution had been given to Miss Lees as to the use of the carbolic acid. After the death of the first girl he had a conversation with Miss Lees, when she said she thought she had administered the cough mixture.

Mr. Brebner, the resident medical officer, said he believed the bottle containing carbolic acid had been in the girls' school about two years. There were in the cupboard mentioned a bottle, marked poison, containing carbolic acid; another with a cough mixture for the girls in the room; a third bottle contained tincture of iron, to be taken in cod-liver oil. It was astringent, but not hot like carbolic acid. Upon being called to see the children, he ordered brandy and an emetic. He could not tell from the symptoms by what cause they had been produced. He obtained other medical assistance, but the girls all died. A *post-mortem* examination showed that death had been caused by carbolic acid. The organs of the body were in a highly congested state, and there was the smell of carbolic acid in the stomach.

After having been cautioned by the coroner, Elizabeth Lees said,—About ten minutes to eight o'clock on Saturday the three girls who are dead came to me for their cough medicines. I invariably kept the carbolic acid at the back of the cupboard, in a corner along with the Condy's fluid, but, by some means or other which I cannot explain, the carbolic acid bottle had got to the front, and was standing side by side with Catherine Kearney's medicine bottle. Since Catherine Kearney had been taking that medicine, I had frequently made a mistake in taking hold of the carbolic acid bottle instead of the cough bottle, but I had found out the mistake by looking at the label. But on Saturday night, having been very unwell all day, I went to the cupboard, and on opening it the gaslight shone on the label of Catherine Kearney's medicine, and I immediately put my hand on the next bottle, fully believing that it was the cough mixture, because I always kept them together. I administered the contents to the girls, giving them a little over one teaspoonful each, and not quite two, that being the quantity of cough mixture I was ordered to give.

There was another glass of medicine poured out, and, having had a bad cough, I was myself in the act of raising it to my lips to take some when Maria Hughes, a nurse, came in. She had previously complained of a cough during the day. I said, "Take this, Maria; this will do you good." As soon as she had taken it, she said, "Oh, dear! how it burns my mouth!" Being rather astonished, I turned round to the cupboard, and I saw the carbolic-acid-labelled bottle standing by the side of Catherine Kearney's. Feeling sure that I could not have made that mistake, I said, "Why, I must have given you Catherine Kearney's medicine, which was to be taken in cod-liver oil." Thinking that was the cause of it burning, I at once poured out some oil and gave it to Hughes. It seemed to make her sick. The other girl, Mary Ann Monaghan, was still waiting in the passage, and I also gave her some oil. She at first refused to take it, but I told her she had better. She drank it, and then seemed very ill. I then went for the doctor.

The coroner, in summing up, explained the law on the subject. Where a person, while doing a lawful act in a lawful way, unfortunately killed another person, the act was in law an excusable homicide. It was for the jury to judge whether this was the case in the present instance.

The jury, after consulting for a short time, returned a verdict "That the deceased girls died from misadventure." They added a recommendation that the board of guardians should take into consideration the use of carbolic acid and other poisonous disinfectants in the workhouse, and by what means and by what persons these disinfectants be used in future.

The nurse Hughes is progressing favourably towards recovery.—*The Manchester Courier.*

Review.

ANÆSTHETICS. By EDWARD R. SQUIBB, M.D. New York. 1871.

Dr. Squibb, of Brooklyn, has recently published a pamphlet on the subject of anæsthetics. The work is, in fact, a paper read before the Medical Society of the State of New York, and was published in advance of the volume of "Transactions of the Society," in the *New York Journal of Medicine* for April, 1871.

We are in England peculiarly well supplied with information on the subject of anæsthesia. We have had many industrious and able investigators on the subject, and are accustomed to find in it a rich and varied literature. To us, consequently, Dr. Squibb's paper is somewhat barren; he speaks only of three anæsthetic substances, viz. nitrous oxide, ether and chloroform, and offers no suggestion in respect to research after other and better substances for general anæsthesia.

The paper evidently is written to support one position, viz. that ethylic ether of specific gravity 0·728, yields the best and safest narcotic vapour; to which is added an endeavour to prove that the same vapour may be made the most applicable agent for general administration. On the question of the safety of ethylic ether, we agree with Dr. Squibb; on the question of its efficiency as a general anæsthetic, when it is efficiently administered, we agree with Dr. Squibb; but on the final question of the facility of its administration, we cannot for a moment agree with him, neither do we think his book in the slightest measure removes the well-known and widely felt objections to ether, on the ground of its indifferent applicability. Dr. Snow hit the mark admirably when he was once called to task, by some critic, for inconsistency. He had expressed his opinion freely, that ether was safer than chloroform. "Then," inquired the critic, "why do you not act consistently, and give ether to your many patients, instead of chloroform?"—"I use chloroform now instead of ether," replied Snow, "for the same reason that you use lucifer matches instead of the tinder-box; an occasional risk never stands in the way of ready applicability." This is strictly true, and it would always hold good as between ether and chloroform, if we were absolutely bound to these two fluids, *i. e.* the one would give us the convenience, the other the safety, and the convenience would prevail; happily, we are not so bound.

We have said that Dr. Squibb's advocacy of the applicability of ether is not borne out by his description of the fact; we think rather that his advocacy lies the other way. For instance, after describing an apparatus of his own construction for the administration of ether, and which we can but admit is a sensible and ingenious device, he proceeds to give us the details of the practice of it. In every case, after the patient is ready, the apparatus, which consists of a sort of double-cone muslin bag, is wetted completely through with water, and afterwards squeezed until it no longer drips. A tin tube is then introduced into the narrow part of the bag, the measured quantity of ether is poured out into a tumbler, a roll of flannel and blotting-board is immersed into the ether to absorb it, and this roll is finally put into the tin tube. Now the bag is charged and ready; the open end is applied to the face of the patient, so as to cover the mouth and nose, and the inhalation commences. The quantity of ether required for the first charge is $1\frac{1}{2}$ to 2 fluid ounces for an adult man, and the administrator is recommended to commence his operations about ten minutes before the surgeon begins his part. When the stage of restless excitement occurs, the bag is to be kept to the mouth with gentle force; if vomiting occur, the bag must be momentarily removed. And when the full stage of insensibility is attained, the bag is for a time removed, so as to avoid the fourth or snoring stage of sleep.

In the close of the account certain precautions are offered for preventing "that supersaturation of the body with ether, which tends to the more certain occurrence of prolonged nausea and vomiting, which so often induce septicæmia, and thus cause death." The author adds that he has sustained anæsthesia with ether for sixty-five minutes, the quantity of ether consumed being less than 5 fluid ounces.

We have given these particulars fairly and fully, because they support what we have indicated, that they are against the reintroduction of ether into practice. When we can narcotize with a fluid which requires fluid drachms only instead of fluid ounces, which can be carried in the waistcoat pocket, which can anæsthetize in from three to four minutes, which can keep up the insensibility for any required time, and which does not nauseate more than ether, we may be sure that fatal accidents from it in the proportions in which such accidents happen, will not cause it to be displaced by so inconvenient an agent as ether. No, the secret of perfecting anæsthesia lies in procuring a fluid as good as chloroform, as convenient as chloroform, and as safe as ether. Already many advances have been made in this direction of research; the action of various narcotic agents has been the subject of much laborious investigation; the reasons of the faults of ether and chloroform have been conspicuously demonstrated, and the actual requirements for a safe and ready anæsthetic have been formulated. This is the true line of progress, from which it is now as impossible as it were unwise to recede. The bad effects of anæsthetics, the vomiting, the convulsion, the syncope, the asphyxia, the occasional death, are, according to one of our most diligent authorities, all accidental and unnecessary attendants on the process of production of insensibility to pain: they depend, that is to say, simply on qualities in the agents as yet employed distinct from the pure anæsthetic qualities of the agents. We prefer, therefore, rather to look forward to the new triumphs of science than, with Dr. Squibb, to go backwards to the old.

The following journals have been received:—The 'British Medical Journal,' April 20; the 'Medical Times and Gazette,' April 29; the 'Lancet,' April 29; the 'Medical Press and Circular,' May 3; 'Nature,' April 27; the 'Chemical News,' April 28; 'Journal of the Society of Arts,' April 26; 'Gardeners' Chronicle,' April 29; the 'Grocer,' April 29; 'Produce Markets Review,' April 29; the 'English Mechanic,' April 28; the 'Doctor' for April; the 'American Chemist' for March; the 'Florist and Pomologist' for April.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[230.]—SILVERING FOR PILLS.—For this process two vessels should be used, a small cup gallipot and an ordinary covered pot. Having placed the silver leaf in the former and the pills in the latter, shake over the pills a very little compound tragacanth powder. Introduce a few drops of proof spirit, according to the number of pills (about one drop to the dozen or less), and disperse it thoroughly by agitation, shaking till the pills are nearly dry. Then turn them out into the silver, cover with a piece of clean paper, and a few turns in the hand will produce a very brilliant result.

I have adopted this plan for some years with unvarying satisfaction.—L. H.

[231.]—BEETLE POWDER.—Powdered borax sprinkled in their haunts is certain destruction to them. I can vouch for its efficacy.—H. C. B.

[236.]—DISPENSING.

R. Potassæ Chloratis ʒij
Potassii Bromidi ℥j
Inf. Gent. recentis ad ℥viij

A sixth part thrice a day.

In reference to the foregoing prescription sent by *J. H. G.*, South Hants, we have received the following communications:—

I should, if possible, have seen the prescriber—presuming, of course, that he was what is called a duly qualified medical man—to call his attention to the unusual and excessive dose ordered, and been guided by his instructions; or if this had not been convenient, I should have dispensed it with potassii bromid. ʒj, which was doubtless the quantity intended,—especially so as this quantity, if taken as directed, would give the usual full dose of ten grains.

I should also have made a note on the margin of the prescription, saying what I had done, partly for the guide of future dispensers, but chiefly to attract the attention of the prescriber, should he again see it.—J. B. LESLIE, *Sheffield*.

No doubt the sign ℥j was a slip of the pen, and was intended for ʒj by the prescriber. I should have felt justified in dispensing ʒj of bromide of potassium, as the sixth part of an ounce would be so much in excess of the maximum dose of the B. P.—H. J. B.

The ℥j is evidently a mistake, ʒj no doubt having been intended; and, in the event of *J. H. G.* being unable to communicate with the physician, he would be perfectly justified in refusing to dispense such a prescription.—GEORGE MASSON.

[*** We do not think the opinion expressed by our correspondents is correct, for notwithstanding the dose stated as the maximum in the B. P., it is a fact that bromide of potassium is given now in very much larger doses, and we do not think the quantity stated in the prescription is at all excessive or unusual.—ED. PHARM JOURN.]

[237.]—RED INK.—I have found the following answer very well:—

R. Carminæ ℈j
Liq. Ammon. Fort. ʒss
Gum. Acaciæ ℈j
Aq. Destil. ℥iij.

Misce.—H. J. BLACKBOURN.

[239.]—FURNITURE CREAM.—The following will be found an excellent furniture cream:—

R. Ceræ Flav. 2½ oz.
„ Alb. 1 oz.
Sapo. Cast. ʒj
Ol. Terebinth.,
Aq. Bull. ana 10 oz.
Potass. Carb. ʒj.

Melt the wax and turpentine together, dissolve the soap and potass. carb. in the aqua, and mix while warm, stirring till cold.—S. D.

[240.]—DISPENSING.

R. Sp. Ætheris,
„ Lavandulæ,
„ Ammon. Ar., ana ʒij
Mist. Camph. ad ℥viij.

M. ft. mist.

The above, if properly dispensed, would be colourless or very slightly milky. Tinct. lavand. co. must have been put in the London mixture by mistake.—W. B. ORTON.

The London dispenser must have used tinct. lavand. co. (which in E. Ph. was called sp. lavand. co.) instead of sp. lavand. as ordered. This would account for its being of a reddish colour.

Properly dispensed, the mixture should be colourless, and perhaps almost imperceptibly turbid.—J. B. LESLIE, *Sheffield*.

There can be no doubt, I think, that the prescription, as dispensed by Mr. Crookes, was correct, and as little question that in the former instance the compound tincture of lavender was employed in place of the spirit, which may, or may not, have been intended. It may be urged against this conclusion that the spirit is rarely, if indeed ever prescribed, and more especially so in combination with spt. ammon. arom.; but the duty of the dispenser in such a case as the present, seems to me to be to send the substance ordered, and not what he may choose to think was intended, and the more so when the substance is an official one; such a course of procedure at once removes any blame from the dispenser to the prescriber, whilst an opposite course might lay him open to censure. Every dispenser must be aware that in nine cases out of every ten, the compound tincture of the Pharmacopœia is designated a compound spirit, and for this reason and the liability to error by the accidental omission of the word comp., I think it is to be regretted that a substance of so little value and so seldom used, as the spirit of lavender, should have found its way into the Pharmacopœia. Here we have a case in point of the value of an assertion made by Professor Attfield in his paper on the "Nomenclature of the Pharmacopœia," that one name should be applied only to one substance (and surely synonyms are not required here); and if we are to have a compound tincture of lavender, do not let us have a compound spirit one time and a tincture the next. In such cases the dispenser is powerless to remedy the evil, and if physicians will persist in such a course, little else can be expected than embarrassment to the dispenser, and consequent inconvenience, perhaps danger to the patient. How much needless perplexity would be saved, if the present nomenclature were studied and adopted by prescribers! What is a dispenser to do when sodæ carb., or, worse still, sodæ sesquicarb. is ordered, say in a doubtful case? or in a mixture where he feels tolerably sure the bicarbonate is intended? or aq. menthæ without any clue as to whether viridis or piperitæ is to used? Every one knows such illustrations might be multiplied, they occur every day, and are productive of much uncertainty and anxiety.—GEORGE MASSON.

I believe, in most large dispensing establishments, tinctura lavandulæ compositæ would be used, and would account for the reddish colour.—H. J. B.

[241.]—WARTS.—Will any reader kindly inform me of a good application for warts. Caustic and acetic acid have been tried, but failed?—OMEGA.

[242.]—IODIDE OF STARCH.—I require a method of making this in powder. I have already made some, but it appears to be in solution and I cannot filter any out; by evaporation, the colour disappears.—J. T. B.

[243.]—HYPOCHLORIDE OF SULPHUR.—I should be glad if some of your chemical readers can give me any information on the subject of the "hypochloride of sulphur," which Mr. E. Wilson orders in the ointment he so frequently prescribes. What is it, what is its composition, and how is it made?—E. B.

Correspondence.

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

The Society and the "Outsiders."

Sir,—The defence committees, metropolitan and provincial, have effected their object—all fear of compulsory resolutions concerning the storage of poisons being extinguished,—and the selected representatives for the new Council are pledged to resist Government interference. Having, on request, allowed myself to be put in nomination for the Council for a special purpose, which no longer exists, I now beg to state my desire to withdraw from competition against those gentlemen who have been considered best fitted to represent the interests of pharmacy for the ensuing year.

Being no longer a candidate, I feel at liberty to remark that, confident as many are in their security under the protection of the new Council, there will never be either safety or repose whilst the trade is divided against itself. Why is the Society to stand in its chilly isolation, a mournful spectacle of mistaken purposes? Why does it not endeavour to draw within its embrace the strength and power of numbers, that when interference is attempted, it may present an unbroken front and a formidable opposition? As it exists it is useless for any great effort. It may drag uphill an educational element, but its weakness is apparent so long as there is a pharmaceutic body and an army of "outsiders."

The first round only of the poison battle has been fought, and, fortunately for the Society, there was no difference of opinion in the trade,—another instance of the benefit arising from unity. But it is not to be supposed that the Privy Council will consent to have its requirements ignored, and our danger lies more in the division amongst ourselves than even in the power of Government officers. The Society is indebted to the "outsiders" for their antagonism, which gave them power over the education of the future pharmacist; but it was never intended to constitute or establish a Society with one idea only. Education is of primary importance, but protection to trade interests and convenience is equally great; and if the members of the Society are to be gratified with their success in placing men of their choice on the governing board, what guarantee will the outside trade have that their position will be considered? In your leader of the 15th ult., you very justly pointed out that the outsiders' inability to influence the action of those in power was "voluntary;" and that if they did not "avail themselves of their capability of legitimately influencing the action of the Society" their abstinence arose from "indifference," while their apathy rendered them unworthy of the sympathy expressed on their behalf.

I quite agree with you that "outsiders" did obtain that concession legally, as a reward for the assistance given to obtain the Pharmacy Bill; and there was also "a tacit understanding" between the leaders of the two parties, quite as clear as that with the Government respecting the poisons, that there should be every facility given to "outsiders" to swell the list of membership of the Society, but no sooner was the power vested in the Council, than they treacherously put aside "a tacit understanding" and created a disgust not easily to be effaced.

This short-sighted policy of the conservative Councillors is now producing thistles where there might have grown figs. If the petty jealousy which animated these gentlemen in their desire to keep the Society for the future generation and their own domination, had given place to a broad and liberal spirit, there would now have existed one united body of chemists, having a common interest to support. The strength political is not in the education of its members, but in the number; and if the miserable policy which has hitherto prevailed could be exchanged for one which recognized every member of the trade, then not only would the revenue be doubled, but a friendly feeling would spring up, and when interference was attempted, there need be no division,—all would fight under the same banner. It is very odd that hitherto those belonging to the Society from its formation, have been chiefly instrumental in retarding its growth and preventing the dream of its founder from being fulfilled.

May 3rd, 1871. John Wade.

Paper Notes for Circulation.

Sir,—May I crave a corner of the Journal to indicate to our brethren the necessity that at present exists for careful examination of the paper that is daily passing through their hands? I do not allude to the daily press, or the paper currency, but to the paper in current use for the purpose of wrapping powders. The demies and other makes of white paper now in use in the trade are very generally impregnated with sulphur compound, introduced for bleaching purposes; and such paper, when used for wrapping pepsine or other powders containing free acid, will in a short space of time, and particularly so upon a damp day, give off sulphuretted hydrogen in unmistakable quantity. My attention has been drawn to this fact by the circumstance of detecting the vile smell of this gas in a recently-dispensed packet of pepsine powders, and fortunately prior to their having been sent out. A first impression led to the inference that the pepsine, although recent stock, was either impure or undergoing spontaneous decomposition; having satisfied myself to the contrary, my attention was naturally directed to the paper in which the powders were folded, a demy of presumed good quality, and which, to the unassisted nose and eyes, appeared to be as good as could possibly be desired for the purpose; but, upon placing a small roll of it in a test-tube, and saturating with dilute acid, it gave out unmistakable evidence of the source of the annoyance.

I have since tested, with similar result, several other papers which I had in stock, and some obtained in the district, also the samples of a London dealer,—and, I may add, the paper now being used for the Journal, which will, in a minor degree, afford illustration.

A prompt and facile mode of examination is to sprinkle a few drops of dilute acid upon a small piece of the paper to be examined, and in about one minute evidence will be obtained by the olfactory organs more than sufficient to damage the historic reputation of any first-class dispensing establishment using such paper for containing pepsine powders. It may be remarked that the gas is more freely eliminated from the under surface of the paper than the upper and sprinkled one, illustrating the high density of this obnoxious gas.

Alexander Bottle.

Dover, April 29th, 1871.

Poison Regulations.

Sir,—You will oblige by allowing me a small space to address my fellow pharmacists again upon the poison regulations. I think I may say we are all agreed that they have lost their most objectionable feature in ceasing to have the character of iron shackles. But it must be remembered that that is not the only question we have to ask ourselves regarding them. Could it be proved that they were free from evil tendencies, I should still protest against their being put forth as the recommendation of our Society, unless it were also evident that they were practically useful, and the most desirable that could be suggested. It is not my wish now to go over the whole argument again; enough has been said to show that the proposed code has been found wanting in many respects, besides the want of liberty to adopt any other precautions instead of them, if others were found to be more applicable. It was stated in the circular of Reasons which the Council issued that the regulations, when proposed to be made compulsory, would not be enforced; how then can we expect that the same regulations, brought forward as a simple recommendation, can meet with general adoption? Enough has been said against them to show that, as a code, they will be a dead letter.

I do not think we could expect the outgoing Council to bring forward any modification of the code, nor do I think that the Society would do well either to pass the code as it now stands, or to attempt to modify it at the annual meeting. More satisfactory results would probably be obtained by requesting the incoming Council to examine the objections raised and the suggestions made in the correspondence you have already published, and in the reports of meetings already held, and endeavour to frame a code which would be more generally useful.

I have no hesitation in saying that recommendations would be of more value if made more definite, and if based upon the use of a poison label, a label stating the dose, and a label "not for internal use," and if every article to which any of these labels was recommended to be applied was distinctly specified.

There will, no doubt, be found other suggestions equally worthy of their attention. BARNARD S. PROCTOR.

11, *Grey Street, Newcastle.*

CONVERSAZIONE, SOUTH KENSINGTON MUSEUM.

Sir,—Last year I observed on the admission card to the Conversazione the direction "Evening Dress."

Now, many of our country members, when upon rare occasions they visit the metropolis, leaving, for a few days,

"Their homely joys and destiny obscure,"

do not carry many changes of dress, and yet, perhaps, they are not intended to be excluded from this gathering.

Could not a more definite statement of what is required be made than "evening dress"?

While many of our London members and their assistants never wear an apron, many of our more humble country associates consider themselves in evening dress when they take off their apron!

Others—old men, like myself—may be accustomed to wear the same dress in the evening as they wear in the morning.

Court dress is defined; and if members are required to appear at the Conversazione in black, or in velvet, let it be so stated. JOSEPH LEAY.

Downside, Chilcompton, Bath,
April 29th, 1871.

PROPOSAL TO ENFORCE EARLY CLOSING.

Sir,—Would you kindly allow me, through the medium of your valuable Journal, to agitate the early closing proposal, which appeared in your last issue. I think the Council might as justly enforce it as the examinations are enforced. After being behind the counter from 7.30 A.M. until 10 P.M. and Saturdays until 12 P.M., may I ask what time is there for study? (Even on Sunday three hours night and morning are required respectively.) If in the meantime an hour's study was allowed daily, it would certainly, in a slight degree, alter the case; but that is out of the question altogether, for the mere appearance of a book within the said hours, makes the too general cry of "Look alive, so-and-so wants making or doing," vibrate through the place.

Without exception do Mr. Newey's statements concerning "existing jealousy" (which also occupied a portion of last week's Journal) apply to certain members of the profession in a town, where apprentices have repeatedly tried and failed to pass their Preliminary examination. What else but failures can be expected amidst *such privileges*, where neither an association is formed or classes to attend? whereas in a neighbouring town, much smaller, all the chemists open and close at eight prompt, and have formed an association and classes, and find it to answer admirably.

I mean jealousy, not only in Mr. Newey's instance, but most particularly respecting the closing of their various establishments. As ten o'clock approaches, those who are severally situate in sight, watch each other like a cat watching a mouse. Eventually one has the *good resolution* to close, then out of a kind of shame the others follow suit, but still don't find their coffers any better filled than some wise exceptionals, who close at eight prompt and find the day's work quite long enough. I think the suggested addendum of your last week's correspondent, would do away, in a great measure, with the ill-feeling amongst members, and greatly facilitate the apprentices and assistants in passing the examinations now set before them.

I hope you will insert this, as it will give those in the metropolis an idea of how business is carried on in the country, and that some influential exertions will be brought to bear to supply the deficiency in the Pharmacy Act of 1868.

JUSTICE.

Sir,—Your correspondent "Aspirant to the Major Qualification" is acting on the maxim of Oliver Cromwell, that, while "it is good to strike when the iron is hot, it is better to make the iron hot by striking." The iron has got cold; so much has been said and written about that all-absorbing topic, the poison regulations, that the old grievance of which your correspondent complains has been lost sight of. I am glad to see the subject introduced again. I do not see the practicability of "Aspirant for the Major Examination's" suggestion, that early closing should be made compulsory; but, if the question were fairly discussed by employers and assistants, I think some improvement on the present state of things might be made, with equal advantage to both parties. Early closing would not only be a boon to those who are preparing for their examinations, but also for those who have passed, and who wish to retain and add to the knowledge they have gained.

ONE WHO HAS PASSED THE MAJOR EXAMINATION.

Sir,—I observe a letter in your impression of last week, signed "Aspirant to the Major Qualification," which, to my mind hits the greatest drawback to our business, namely, the absurdly long hours of business.

His object in writing is to gain for students the time necessary for study—a worthy object. But when "Aspirant" has passed his Major Examination, and finds himself in business some day, will not the burden of his imprisonment be even yet harder to bear? He will find himself opening his shop at 7.30 A.M., from which time until 10.30 or 11 P.M. he will not be able to leave his occupation. Can any position be more pitiable?—a recluse *nolens volens*, debarred from all those social enjoyments and relaxations which make life's journey pleasant.

A gentlemanly profession, forsooth! Certes, had I known, or been in a position to calculate, what would follow when I served my apprenticeship of five years to a worthy man in a country town, with plenty of spare time and freedom, I had quickly abandoned all idea of adopting pharmacy.

And I ask any sensible chemist why, in the name of all that's rational, we glue ourselves to our counters for two and three hours after other tradesmen are enjoying that rest which a long day's work demands? I venture to think no one will assert that the exigencies of the profession require it. All the thought the public takes for us is embodied in a remark made to me last night by a gentleman who brought his prescription at 10 P.M.: "I should have come earlier, but I knew your shop would not be closed." Therefore, we must act for ourselves. This would be easy enough if those in high places amongst us so willed it.

Pray pardon me for occupying so much of your space, but, when on this subject, I can't help, as Sam Weller says, "opening the valve a inch or two."

A PHARMACEUTICAL CHEMIST.

Brighton, April 29th, 1871.

"JURY SERVICE."

Sir,—The letter of "W. B. O." in your last Journal, appealing for the Council's consideration of exemption from "jury service," is a just and reasonable one; and this subject may be urged upon the Privy Council very appropriately.

The amended Pharmacy Act imposes upon all chemists and druggists regulations which require the constant attention and personal inspection of the proprietor, to see that they are carried out, he being responsible for any omissions by any one left in charge.

Is it therefore just or right that such regulations should be imposed by the Legislature unless, at the same time, there is provided "exemption from jury service" for all upon "the register?" W. J.

Leek, May 1st, 1871.

THE PHARMACEUTICAL EXAMINATIONS.

Sir,—I ask leave to express my satisfaction with the letter of "Minor Associate" in your last week's issue on the above subject. I think with him that the case of the "Modified" men was as well met as could be under the circumstances; although there was a degree of hardship in the retrospective character of the Pharmacy Act.

As one who was compelled to avail himself of the less stringent examination, I beg, however, to protest against the "Ah, me miserabile!" style of some of your "modified" correspondents.

Doubtless there are many of these, even as of pharmacists of, say, ten or fifteen years ago, to whom the present Preliminary would be an impassable barrier; but on the other hand, let it be borne in mind that there are not a few to whom it would be a trifle, who have neither time nor inclination to superadd to their present duties that of acquiring proficiency for an examination in technical science. "Modified" gentlemen desirous of pharmaceutical honours ought not to shrink from the conditions upon which they are obtainable.

My own opinion is that with the qualifications necessary to pass the "Modified," £1000 and a good opening for business, any one may leave all doubts about getting on to "aspiring" members of the profession.

ANOTHER ASSOCIATE.

Sir,—I quite agree with *B. S.* that the Council ought to be a little more just in their rules, etc. in respect to the examinations. I will not take up much of your valuable space, but I should like to say a word on the separate examinations for chemists who were in business at the time of the passing of the Pharmacy Act. I was in business myself at the time, and made application to the Secretary for examination, but was informed that I either must have been in business five years or be not less than thirty years of age. I could not comply with either, as I had only been in business about a year and was only twenty-eight years of age. I was anxious to pass the examination; but I could not think of starting with the Preliminary Examination at my age and with the cares of business. It may be said that a line has to be drawn somewhere and that it must be hard for somebody. Now I contend if a line is to be drawn, why not in all fairness draw it thus, viz., that all who were in business for themselves at the time the Act was passed ought to have been entitled to pass the separate examination irrespective of their age? What has age got to do with it so long as a man is in business? Will some one plead my cause? if they do they will plead for many in like circumstances. The Council ought to revise their regulations on the above subject and give all a fair start.

PRO BONO PUBLICO.

Sir,—Your correspondent *George Sant*, in last week's Journal, is quite correct, I am sure, in his assumption that "many of the unsuccessful in the last" Preliminary knew little or nothing of the Latin language before entering their apprenticeship, and I am glad he has opened up the subject in order that it may be thoroughly ventilated. I should like to see some of your abler correspondents give some hints and recommendations to those who are in the following position, and they are not a few. A young man not having received a classical education, possibly educated at a British school, and whose parents were not in a position to give him a liberal education, aspires to the trade of chemist and druggist; he becomes an apprentice before the passing of the Pharmacy Act, not knowing that examination would be compulsory, and twelve or eighteen months after he has been apprenticed the Act is passed, compelling him to learn Latin during his business hours and to undergo a thorough training—a most desirable thing, but which, if he had known it before, would have turned his attention to some other trade or profession, possibly as remunerative and requiring no classical knowledge.

In your leader of the 22nd ult. you say the questions apart from Latin "were not at all more difficult than a boy who has received a liberal education might be expected to answer." Unfortunately all have not received a liberal education, and it is on behalf of such I write and ask for information for their direction. Can anything be done to meet their case? May they expect any mercy at the hands of the examiner?

To a youth having just left school and knowing such an examination has to be passed before entering on the study of chemistry, botany, etc. it is nothing, but to such an one as I have described the case is widely different; and you would be conferring a great benefit upon such if you would open your columns for a little interchange of ideas upon this particular subject, and upon which our future pharmacists depend.

SYMPATHETIC.

[**** In reply to our correspondent's inquiry, we would suggest that since a liberal education is a necessary qualification for the practice of pharmacy, those who are wanting in that respect should either overcome this deficiency or abandon the idea of becoming pharmacists. At the same time, we think it would not be any great hardship to acquire a knowledge of such Latin as is of daily use in ordinary business.—ED. PHARM. JOURN.]

Sir,—In the beginning of the year 1869 I was one of a number of gentlemen who passed the Modified Examination. Several months later, whilst busy at my work of preparing for the Major Examination (my progress being but slow, in consequence of the calls of business), I heard that some bye-laws had passed which took from me the right of presenting myself for examination, and swept away whatever privileges I had possessed upon my election as an Associate of the Pharmaceutical Society.

Had I been in the least warned of such a step, in all probability I should have taken immediate steps for entering my name on the list of candidates for a Minor Examination, or, to say the least, if I had had any degree of foresight I might have avoided, as a snare and a delusion, the Modified Examination,—which, in truth, I had elected solely on grounds of economy.

To an outsider, such a case may appear trivial, and nothing worse than a mild dose of red tape; but to many assistants who have already passed middle age, it is far otherwise. I refer especially to those who are engaged in some of our bustling shipping and manufacturing towns, where the hours of business range from 6.30 or 7 A.M. to 10 P.M., and not unfrequently midnight. I know of situations where it would puzzle the boldest to find any time for study; but, for the sake of brevity, I will not multiply instances. Is it reasonable that the meaning of the Pharmacy Act should be so affected by stringent bye-laws as to withdraw the only bond of sympathy that connected the most intelligent part of our assistants with the Pharmaceutical Society?

I hope the Council will reconsider their cruel decision, and prevent the estrangement of a large body of well-meaning gentlemen. The result will be, I feel sure, a source of encouragement to many who are striving, by self-instruction and other means, to fulfil their part in the elevation of their profession.

SPES.

Warrington, April 28th, 1871.

A CHEMISTS' CLUB.

Sir,—Having frequently been asked by young men in the country, "Where can we stay if we come up to town to attend the Pharmaceutical Society or in search of situations?" it has induced me to address those in the trade through your columns on the subject of a "chemists' club" being formed, where young men could have the comforts and accommodation of home at a moderate expense. I am fully convinced it would be well supported, not only by those in the country, but also those resident in town, and there are many advantages which would be derived from such an institution. I should much like to see the matter further discussed in your Journal.

A SUBSCRIBER.

C. P.—The plant sent is not *Ranunculus bulbosus*, but is the common celandine, figwort or pilewort, *R. Ficaria*, Linn. var. *α. divergens*, F. Schultz. Its acrid property has led to its use for outward application in some forms of tumours, but this acridity is easily dispelled by heat,—indeed it is used as a potherb in some parts of Sweden. It is not nearly so acrid as some of the buttercups, though moist grass lands are sometimes dressed with coal or wood ashes to destroy it. We do not remember an instance of its injurious effects to man or beast. Figures of that plant and *R. bulbosus* can be seen in Sowerby's 'English Botany,' vol. i.

F. Thompson.—You had better apply to the Secretary for a Syllabus of the Examination.

E. Hall.—Yes.

C. G. B.—The sum of 10*s.* 6*d.* paid annually by a registered apprentice or student of the Society is not paid by him for the Journal, but as the subscription attached to connection with the Society. In virtue of this connection he is entitled to be supplied with a copy of the Journal free, to the free use of the library and museum, and to attend the lectures of the professors at half fees. The Jacob Bell scholarships, also, are, under certain restrictions as to age, open to him.

Querist.—See the information on this subject already published, *ante*, pp. 590, 752, 772, 791, and in this week's number, p. 890.

G. H.—A formula for "Pick-me-up" has already been given at p. 497.

W. Clark will find a formula for peppermint cordial on p. 497 and one for aniseed cordial on p. 737.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. E. Agnew, Mr. E. Skipper, Mr. J. Whitfield, Mr. J. Metherell, Mr. C. Symes, Mr. A. Marshall, Mr. A. T. Girdler, Mr. M. C. Cooke, Mr. A. H. Mason, Norwich Chemists' Assistants' Association, C. H., J. T. V., M. P. S., B. S., "Kappa," "Tol Pedn Penwith," "Hydrargyrum," "Stucco." A. P. S. has not complied with the rule as to anonymous communications.

ORIENTAL SPICES.*

BY JAMES PATON,

Assistant-Keeper in the Museum of Science and Art, Edinburgh.

In the early history of the world, and down to comparatively modern times, the trade in spices occupied a very different position from that in which we now find it. The name itself indicates that they were the chief medium of international exchange; and in our language, to the present day, we have the word specie applied to gold used for such exchange. Both words are derived from the Latin *species*, kind or quality; thus both spice and specie mean *the* special kind or medium of trade. Spice was thus in ancient times the staple of foreign commerce, as cattle was that of domestic trade; in process of time men found it convenient, instead of dragging about their oxen, to use the image of an ox on a bit of leather, hence pecunia and pecuniary, or cattle transactions; so also in foreign commerce specie or gold tokens came into the place of, or to exchange for spices.

As the primary object of this paper is to give an outline of the commerce in these substances, only such notes of their natural history will be prefixed as may enable us to comprehend what we mean by Oriental spices, and some of the conditions under which they grow.

All spices have in common a hot pungent taste, and are possessed of stimulant properties, in which their value chiefly lies; they possess, in addition, a more or less pleasing aromatic flavour, and these properties reside in an essential oil, or other chemical bodies they contain. They are drawn from widely different sections of the vegetable kingdom, and from very various organs and parts of plants. Thus we have spices from rhizomes or root-stocks, from bark, twigs, leaves, flower-buds, fruit and from the appendages of the fruit, so that almost every part of the living plant is in turn employed to yield these precious products. Notwithstanding this, the series of substances used to any considerable extent in the form of spice is not at all extensive; and it is only to the two or three, which have had much commercial importance, including cinnamon and its allies, common pepper, the clove, the nutmeg and mace, that we may at the present time refer.

Foremost in order of antiquity, most highly prized for delicacy of flavour, and most generally esteemed, stand the spices of the cinnamon series. In regard to these, a considerable amount of confusion long existed, and still, to some extent, remains. Cinnamon, cassia, or cassia lignea, and cassia vera are the recognized commercial distinctions of these substances; and as regards properties and value they are quite sufficient. They are the barks of various species of trees or shrubs belonging to the Natural Order *Lauraceæ*, or Laurels; and, as cultivated, are in their foliage and general appearance not unlike the so-called laurels or bay bushes common along all garden and park walks. Were the plants allowed to develope they would become trees of considerable size; but as the most valuable bark is procured from young shoots, the coppice system is pursued in their cultivation; that is, they are treated as we treat our plantations for yielding oak bark, the main stem being cut down, a vigorous growth of shoots springs from the roots, and from these shoots cinnamon and cassia are prepared.

The true cinnamon of modern times is derived from *Cinnamomum Zeylanicum;* so named from the impression that Ceylon is the native country of cinnamon. Undoubtedly the best, and, till within very recent times, the only true cinnamon brought to Europe, since the Portuguese opened up the Cape passage, came from Ceylon. But it is remarkable that, previous to the settlement of the Portuguese in Ceylon, only the most obscure hints regarding its existence in that country are to be found. And it was not till well into the seventeenth century, after the Dutch had long held the island and devoted very great attention to the cultivation of this spice, that the fame of Ceylon cinnamon arose, as being the finest and richest in the world. Ceylon may, notwithstanding, have been its native country; but, in that case, the cinnamon of the earlier ages must have been a variety of cassia, which we find by Pereira is in much greater esteem than cinnamon in the East of Europe—the countries of the early overland traffic. Or it has also been suggested that cinnamon, as well as coffee, is a native of north-east Africa, the country marked in ancient maps Regio Cinnamomifera or Aromata; now known as Guardafui, from two Arabic words, meaning the promontory of spices; and that the enterprising Arabs conveyed the plants to both the Malabar coast of India and Ceylon; in the latter of which all the conditions for the most perfect development of their properties existed, whereas in India they quickly degenerated, and have only left their traces in valueless wild plants found among the Coorg Hills.

The sources of the less delicate spice, cassia, are more numerous, being produced by several species of *Cinnamomum;* and geographically, it is comparatively widespread. The species of *Cinnamomum* yielding cassia have not yet been very clearly established; but there is no doubt that Chinese cassia, which is most largely imported, is yielded by a different species from that which flourishes in Hindostan. The old Dutch naturalist Rumphius remarked that cinnamon, cassia, and clove bark, though so very much alike, are scarcely ever found in the same countries; it is, therefore, probable that cassia is produced in the different regions where it grows from different but allied species. However, as no commercial distinction is maintained betwixt these, it is sufficient for our purposes to know that cassia is a comparatively widespread spice, cultivated in China, the Malay Peninsula, Hindostan, and many of the islands of the Indian Archipelago.

The bark known as *Cassia vera*, is the thick pieces taken from the old stems of the species of *Cinnamomum*, and differs from the others only in containing a very large proportion of woody fibre to an exceedingly small percentage of aromatic matter.

The less important spices yielded by the Order *Lauraceæ* we simply enumerate as cassia buds, the flower-buds of species of *Cinnamomum;* clove bark, the Culitlawan or Kulit-lawang bark (*Cinnamomum culitlawan*) of the Moluccas or Spice Islands; and the Ravensara nuts of Madagascar (*Agathophyllum aromaticum*). The commercial relations of these are unimportant.

Cloves, which are the flower-buds of a tree, the *Caryophyllus aromaticus*, belonging to the Natural Order *Myrtaceæ* or Myrtles, were originally confined

* Paper read before the North British Branch of the Pharmaceutical Society at Edinburgh, April 24, 1871.

to five exceedingly small islands in the Moluccas. The culture was transferred to Amboyna by the Dutch, who, for the purposes of their monopoly, made the most strenuous and barbarous efforts to extinguish the growth in all other parts. Even a removal of this small distance had such an effect upon the highly sensitive clove-tree, that it threw back the period of bearing from the seventh or eighth year of its age in its native islands to the twelfth or fourteenth in the Amboyna group. On this account Rumphius, who calls the clove "the most beautiful, most elegant and most precious of all known trees," says, "Hence, it appears, that the Great Disposer of things in His wisdom, allotting His gifts to the several regions of the world, placed cloves in the kingdom of the Moluccas, beyond which, by no human industry, can they be propagated or perfectly cultivated." For many centuries the truth of this assertion remained unassailable; and it was only about the beginning of this century that the tree was successfully grown away from the Archipelago, being then introduced to several French colonies in the Indian Seas, Guiana and the West Indies, and Zanzibar on the East African coast, from which last the chief supply of cloves now comes. But this feat against nature, as Rumphius would assert, was only accomplished after long-continued efforts and repeated failures, and owed its measure of success to the bitter monopoly of the Dutch, who, to maintain their monopoly prices, were often obliged to burn their superfluous stores; and it is on record that in two days in 1760, 8,000,000 florins' worth of cloves were burned at Amsterdam, perfuming the air with delicious fragrance, and distilling spicy streams of essential oil from the burning mass.

The following is a fanciful description of the clove-tree by Sir Thomas Herbert:—"'Tis most part of the year green, having leaves long and small distending into many branches. It blossoms early, but becomes exceedingly inconstant in complexion, from a virgin white varying into other colours; for in the morning it shows a pale green, in the meridian a distempered red, and sets in blackness. The cloves manifest themselves at the utmost end of the branches, and in their growing evaporate such sense-ravishing odours, as if a compendium of Nature's sweetest gums were there extracted and united."

It is at the point when the opening flower-bud from being first a delicate green has passed through a pale yellow to a blood-red that the spice is ready for harvesting. If left on the tree after this period, the calyx rapidly swells, the fruit ripens, nearly all aroma disappears, and what are known as mother-cloves are produced.

The clove-tree is remarkably variable in its yield; some years there is almost no harvest, and at varying intervals of from three to six years there is an extraordinary crop. Seven pounds is a large average for a tree, but some trees have been known to yield regularly from 40 to 60 lb. Rumphius mentions a remarkable tree, 130 years old, which one season yielded the enormous quantity of 1100 lb., and next season half that quantity. At that time the produce of this single tree for these two years would yield nearly £300; and that was a much larger sum then than it now represents.

(To be continued.)

KALA NEMUK, OR BLACK SALT.

BY M. C. COOKE, M.A.

This drug is in high esteem amongst the natives of India, and appears to be nothing more than an impure chloride of sodium containing a little sulphuret of iron. It has the appearance of a brown, dirty table salt, discoloured with soot, not by any means prepossessing. Under the heading of sodii chloridum, it is briefly alluded to in the Pharmacopœia of India. The Hindustani names are Kala-nimuk, Bit-loban or Bit-noben, Pud-loon, Nimuch-seeyah and Sownchurloon. In Persian and Arabic it is named Melk, Melk-nuft, Melk-aswed, Nimue-i-nuft, Nimue-i-sed and Nimue-i-hindi. It is probably the sal asphaltites and sal sodomenus of Galen and other ancient authors.

The following is the description of this substance as given by Dr. Waring. It occurs in large irregular masses, for the most part of a dark brown colour. It has a strong saline taste, communicating a peculiar sensation diffused over the mouth, which is not easily described. At first the taste is disagreeable, but those who are in the habit of using it, declare that it not only becomes pleasant, but is often taken to remove a disagreeable taste from the mouth. When the salt is perfectly dry, it has scarcely any perceptible smell; but when moistened it sends forth a strong smell of sulphuretted hydrogen. It dissolves readily in a small portion of water, forming a solution of a greenish colour, which emits a strong sulphureous smell, resembling bilge-water, or the foulest gun-scourings. By exposure to the air the smell gradually abates, the greenish tint disappears, the liquor becoming clear as the purest water; when this has taken place, if the solution has been pretty strong, on pouring out the water the inside of the vessel in which it was contained is found lined with a crust of a dark brown colour—a phenomenon observed in most sulphur wells; this will be best discovered if the experiment is made in a glass vessel.

It was for some time considered doubtful whether or not this was a natural or artificial product. That there is a dark-coloured natural salt to which the name of Kala-nemuk, or black salt, is applied there can be no doubt; but it is equally certain that the drug so highly extolled by the natives for its medicinal virtues is an artificial combination of common salt with iron and sulphur. It is this artificial product, therefore, which is the subject of these observations, and which possesses pharmacological interest.

The following analysis and method of preparation are given on the authority of Playfair's translation of the 'Taleef Shereef':—Black oxide of iron, 6 grains; sulphur, 14 grains; muriate of lime, 12 grains; muriate of soda, 444 grains; loss 4 grains = 480 grains. It is thus prepared:—Take two seers (about 4 lbs.) of anula (fruit of *Emblica officinalis*), one seer (about 2 lbs.) of Ashkhur (iron scoriæ?), bruise both and mix them with 20 seers (about 40 lbs.) of rock-salt, also bruised; put the whole into a vessel, cover the vessel with a cloth, all except the mouth; lute this cloth well with soft clay, and place it in the sun to dry. When perfectly dry, put it on the fire (let the mouth of the vessel be rather small). Keep constantly stirring it with an iron spatula or spoon; when well boiled and mixed, take it off and allow it to cool, then add tinkhar (borax), jawakhar (an impure borax), tilkh (talc, probably), kibreeth (sulphur), sweet salt and soot, equal parts; mix all well together and add a quantity of salt water; then boil the whole down and strain slowly through a cloth by drops, then boil the clear fluid till crystallization takes place.

This appears to be the genuine medicinal salt such as we have met with, and which was known to Dr. Waring when he wrote the description we have quoted. In the Punjab an artificial black salt is made without iron or sulphur, according to Mr. Baden Powell, who gives the following mode of manufacture in his recent volume of 'Punjab Products.' It may be remarked incidentally that there are several compounds known to the natives under different names which have chloride of sodium as a principal ingredient:—"One maund of Sambar, or Dindwa salt; $\frac{1}{4}$ seer of 'baherah' (fruit of *Terminalia belerica*), $\frac{1}{4}$ seer of 'har' (fruit of *Terminalia chebula*); $\frac{1}{4}$ seer of 'aonla' (fruit of *Emblica officinalis*); $\frac{1}{4}$ seer of black sajii (impure carbonate of soda): all these are put into an earthen pot over a fire and kept there till scorched; when about 35 out of 41 seers remain, the pot is taken off and the black salt is made. About two maunds of wood are used. The price is now in Bhawani three rupees per maund. It is used only as medicine, and is exported to the North-Western Provinces and to the Punjab. No tax is levied at Bhawani, but it pays duty as salt when taken across the customs' line." It is called Kala nimak or Nimak sonchal. There is no indication of iron in this process. Probably both methods are employed, and hence the 'black salt' may or may not contain iron according to its mode of manufacture. The name given in the 'Taleef Shereef' is Nemuk-soonchur or Nemuk-sia, called also Bitlaban and Kala-nemuck. It is described as a tonic in dyspepsia or gout; a deobstruent in obstructions of the spleen and mesenteric glands of children; a stimulant in chronic rheumatism and palsy; a vermifuge. Dr. Henderson and Mr. Twining consider that there is reason to believe that in chronic enlargements of the spleen and liver, the result of malarious poisoning, it possesses considerable powers. Twining advises its administration in doses of gr. x. with ʒss of the black myrabolan every morning, in the intervals between the employment of his famous spleen mixture. It is held in high esteem in various forms of paralysis, especially in that in which the organs of speech are affected, and it is extensively used by native farriers in the diseases of cattle.

THE PREPARATION OF CHLORAL.

Extracted from the remarks of DR. E. R. SQUIBB *before the American Pharmaceutical Association.*

Chloral is the ultimate product of the action of chlorine on alcohol, as its name implies, the first syllables of the two words being formed into the name; "chlor," the first syllable of chlorine, and "al," the first syllable of alcohol, making "chloral." When chlorine gas in a dry state is passed into absolute alcohol, a series of changes appear to take place which may depend on the abstraction of hydrogen and the substitution of chlorine. The first portions of chlorine gas that pass into absolute alcohol are converted, or appear to be converted, at once into hydrochloric acid, and that hydrochloric acid is absorbed by the remainder of the alcohol and reacts with it, producing hydrochloric ether. The second step in the reaction is to again decompose or supersaturate this hydrochloric ether with chlorine, and then hydrochloric acid escapes; and finally, as heat is applied in the process, the hydrochloric ether escapes and a substitution appears to take place, whereby chlorine is substituted for hydrogen in the already-decomposed alcohol. This is but a rude outline of the process. Chloral was discovered by Liebig in 1829 or 1830, although the paper in which it was described was not published until about 1832; therefore it is commonly stated that he discovered it in 1832, which is incorrect. Dumas was the next who investigated it, and these two observers investigated it as a table specimen product. Last year, Dr. Otto Liebreich, in his physiological investigations regarding the group of anæsthetic chemicals, reasoned back to this substance the known effects of chloroform, and tried it first upon animals, then upon patients. At first he supposed it was an anæsthetic, but afterwards modified this view, and now I believe regards it as a hypnotic, and, in some cases, an anodyne. The apparatus for making chloral consists, first, in the means of generating chlorine; second, in the means of drying the chlorine; third, in the means of passing it into absolute alcohol without loss; and, fourth, having the absolute alcohol in such a position that it can be gradually warmed. The process requires about twenty-eight days for the current of chlorine to be passed into the absolute alcohol, and I believe the slower the current passes into the absolute alcohol the better; that is to say, the longer the time which is taken to produce the chloral the better; I think there is less waste and more chloral obtained for the same quantity of alcohol. It is a curious circumstance that hydrate of chloral is produced by passing the chlorine into absolute alcohol, and this shows that water is one of the results of the decomposition of the alcohol; yet if hydrated alcohol be used, the product is different. I have tried different degrees of strength of alcohol, from absolute down to ninety-two per cent., and have obtained good results only from absolute alcohol. 16 gallons of such alcohol, in twenty-eight days, with the use of about a ton and a quarter of mixture of binoxide of manganese and common salt, and about the same quantity of sulphuric acid,—the 16 gallons of absolute alcohol weighing about 92 pounds,—I obtained about 160 pounds of crude hydrate of chloral. This crude hydrate of chloral, as it is made by the passage of the chlorine into the alcohol, is contaminated with several other products which pass over in the distillation, and cannot be separated by simple distillation. It is necessary, therefore, to apply sulphuric acid in the purification of the chloral. Concentrated sulphuric acid is shaken with the crude hydrate of chloral, and the dehydrated chloral is then distilled off from the sulphuric acid. In this way we get chloral that is free from water. After purifying this by one or two applications of sulphuric acid, then the stœchiometric proportion of water is added, and it is either sublimed or crystallized. In connection with this hydrature allow me to go back to the name of chloral. I propose to call it simply chloral,—not hydrate of chloral, nor chloral hydrate. It seems to me surplusage, as we do not in our language commonly call hydrated compounds hydrates; that is, we do not usually recognize the presence of combined water in the names of chemical compounds.

We do not say hydrate of sulphuric acid, or hydrate of hydrochloric acid, and in this case we shall save a good deal of nomenclature that is useless by calling it simply chloral. We heard yesterday, that the bees by taking a little honey from each flower gathered thirty millions of pounds. Every flower and every bee helps to make the aggregate. A certain amount of nervous force is expended on every word we utter, and if we save this word now (and now is the time to start), it will save an aggregate of nervous force which, in the future, will amount to a great many lives. I do not believe in useless language, particularly where it can so well be avoided, and, therefore, think we had better call this from the beginning, simply chloral, although the other name is pretty generally used.*

The difficulties in the way of making chloral are very numerous. The apparatus I have now at work is about the tenth modification from the first one, and I started with all the knowledge on the subject then in the books. The liberation of chlorine from common salt and black oxide of manganese by running sulphuric acid into it is easy enough, but unless the current be steady the result is imperfect, and there can be no good or definite calculations made as to the time or the quantity. The black oxide of manganese and common salt need both to be assayed and added together in their equivalent proportion, and then the calculated amount of sulphuric acid in any given specimen is to be made upon its specific gravity, and the acid can only be added to the mixture by calculation, because, if added until chlorine ceases to be eliminated a great excess will be used. I mix 100 pounds of the mixture of black oxide of manganese and common salt with about ten gallons of water in a still, and then run seven gallons of 60° slowly into it, using "pan acid," 1562 specific gravity, using a mechanical stirrer, and heating the mixture. In this a tolerably uniform current of chlorine is eliminated. This is then conducted to the drying apparatus, which consists of a three-neck Woulfe's bottle, with a long, narrow glass percolator ground into the middle neck. This percolator is filled with pieces of broken glass from which the fine particles have been sifted out, and into the top of this broken glass, concentrated sulphuric acid is supplied from an elevated reservoir. This acid percolates through the broken glass, and accumulates in the Woulfe's bottle below until it reaches the level of an adjusted siphon, by which it is discharged through one of the necks of the bottle. Through the third neck the chlorine enters by a tube which dips under the acid in the bottle. Thus the gas is made first to bubble through the acid in the bottle, and then to pass over the extended surface of broken glass in the tall percolator, this surface being kept moistened with fresh portions of acid, and thus becomes thoroughly dried and in the proper condition to enter the alcohol. The chlorine thus passed down into the alcohol at first increases the volume of the alcohol by one-fourth. At first, the whole of the bubbles of gas are absorbed, and the alcohol increases in volume and becomes heated, the bottle requiring to be kept cold; but after about three days the reaction between the chlorine and alcohol becomes more sluggish, and then a little heat in the bath is necessary. From that time the bath is made gradually warmer until the end of the process, which is determined by the gas pressing unchanged through the hot liquid in the bottles. The product is then the crude hydrate of chloral. Then if the contents of the bottles be allowed to cool, a large proportion crystallizes. It will not run from one part of the bottle to another, but still is very moist. This is taken in portions of about twenty pounds at a time and shaken up with six to eight pounds of strong sulphuric acid, the whole mixture poured into a tubulated retort and the chloral distilled off. This is received in a clean, dry vessel, is weighed, and then partially hydrated with a weighed quantity of water. Carbonate of lime and slaked lime are then added in the proportion of four ounces to each twenty pounds, and the mixture is again distilled from a clean apparatus. The result of the distillation now is partially hydrated chloral; it distils better partially hydrated than when hydrated entirely. The remainder of the water required by stœchiometrical calculation is now added, and the hot liquid poured on plates to crystallize, the plates being covered by a bell-glass. In a few hours the crystallization is complete, and if well managed the contents of the plates are in a solid cake, which is rubbed into a coarse, damp powder in a clean mortar, and filled into bottles.

I obtained from 16 gallons of absolute alcohol 160 pounds of crude chloral, which, when purified, yielded about 125 pounds of purified hydrate of chloral. That is about the best yield I have yet obtained. I have now about 65 gallons in process all the time, by a series of baths, by which I expect to get 140 pounds, or thereabouts, every week, or every ten days; that is, each bath being of a different age, and being finished in about thirty days, will give one bath or process every ten days. It will thus be seen that it is not a very profitable preparation to make, particularly when made in competition with the German article, and I believe I should never have undertaken to make it, except for my conviction that it is the most important of all the additions to the materia medica for many years past, and very commonly sent to our market from abroad of bad quality, and without any traceable responsibility in regard to quality or make.

Some accidents of an apparently trivial nature seemed to indicate that chloral is very liable to decomposition from contact with organic matter, but experiments have shown that it is not equally liable to this decomposition from all kinds of organic matter. Even the same kind of organic matter does not always produce the same effect with the same chloral. For example, where syrup of orange-peel is used as a vehicle, decomposition, with the production of hydrochloric acid, will sometimes commence in a day or two, and sometimes not for weeks, though the apparent conditions be the same. One observer will testify that with simple syrup it never spoils or decomposes, while another, equally trustworthy, will find the same chloral decompose with simple syrup very promptly. Under such circumstances, the only safe practice is to keep chloral as free as possible from all organic matter until we know more about it; and this particularly in view of the harm it does when given in even a partially decomposed solution. It appears to be by far the best practice to dispense it in simple watery solution in glass-stopped vials, since in this condition it keeps

* While this note is being prepared for publication a serious mistake, by abbreviating the words hydrate of chloral to "hyd. chlor." in prescription, was corrected in time to avoid danger.—E. R. S.

indefinitely, and can be added to any desired vehicle at the time of taking; and ice-water appears to be about as good a vehicle for this, as for all saline substances, as any yet devised. When given to patients who have been long fasting it is often found to disagree with them, or at best to affect them less favourably than when given near a meal, or when the gastric secretions are not in the condition of long fasting. Hence, the syrup of orange-peel, or the mucilage, etc., with which it is common to give it, may not be without useful effect, and those physicians who have now abandoned these mixtures for the simple solution, often if not generally, advise their patients to eat a cracker, or take some other light food in small quantity, before or immediately after a hypnotic dose. When the medicine affects persons unfavourably, it should always be examined for hydrochloric acid by smelling and tasting, and by litmus paper. Nitrate of silver is too sensitive a test, for if the solution have been some time made, and especially when water containing organic matter is used, a cloudiness may be produced with this test which it is quite safe to disregard.—*Proc. Am. Ph. Association*, 1870.

FILTERING-PAPERS AND FILTERS,

With General Remarks on the Important Branch of Practical Pharmacy in which they are employed.

BY JOSEPH M. HIRSH, OF CHICAGO.

Original suggestions are almost impossible upon this practical topic, which, for we know not how many centuries, has busied not only the master minds occupying themselves with the sacred healing art, but everybody almost in all vocations of life; and the excellent suggestions regarding filters, laid down in all works on practical pharmacy, will be a sufficient apology for confining the present essay to a few observations on the filtering-paper and filters in general use. The main object of filtration, with especial reference to pharmacy, being the separation of a clear liquid from a solid residue, we must demand as of prime importance of the filtering medium, that it offers a dense, uniform, unbroken surface to the liquid passing through it, so that no solid particles may pass through the same, the complete separation of which from the liquid is aimed at.

The most ordinary objects of filtration at the pharmacist's are the preparations of clear tinctures, and the restoration of such liquid preparations as have grown turbid or deposited a sediment by standing, respectively by decomposition; these latter instances being, a pity to say, by no means exceptional. For this object paper is mainly employed as a cheap and convenient medium.

The general characteristics of good filtering-paper, like complete dense felting, uniformity, poverty in soluble salts, constituting its ashes, are well known, and your reporter can only repeat the experience of many who have found good Swedish filtering-paper to fulfil all claims of prime quality made upon it. But it was always selected with some partiality, because upon repeated tests of the ordinary filtering-paper, obtainable in our backwoods town of Chicago, a sad deficiency was found. Three qualities were chiefly obtainable.

The French grey filters, coming in *round* sheets, ready for folding; *square* grey sheets, sometimes of lighter colour and white; square sheets, so-called Swedish filtering-paper, which it might be, although the coolness with which it keeps its name is the only sign of its northern home. It is not felted evenly, some spots being quite heavy, while others are so thin as to be semi-transparent, and others again permit not only the passage of light, but of solid tangible substance. In fact I could never obtain any Swedish filtering-paper here but what had at least some pinholes. Of the grey filtering-paper, the round French, as also the square, twenty sheets in each hundred examined contained pinholes. Such paper is perfectly useless for the separation of some precipitates, while it may answer for the separation of others, such as would fill up even the gigantic pores of imperfect filters. In this case the first turbid filtrate would have to be returned upon the filter, upon which the deposition of the first precipitate then forms the true filtering medium.

The safest way in using such filtering-paper is to use a double filter, when the dense, unbroken sheet of the one, upon being moistened, will closely press against the sides of the second filter, thus closing up any imperfections present in the same, although there is one much better way, namely, not to use such filtering-paper at all. In some cases the use of double or even quadruple filters becomes necessary, even if the quality of the paper is excellent, as in the filtration of concentrated aqueous solutions of oils or carbolic acid, when a clear solution is desired. In this case the benefit resulting from the use of several layers of paper is not only due to the greater depth of the filtering medium through which the liquid has to pass, but to the different direction given to the liquid during its passage through each filter, so that it pursues a zigzag course through the different strata of paper, which is equivalent to a longer and more obstructed passage, with which the good effect of filtration increases. Paper filters, on account of the feeble strength of the material and its limited size, can only be used for operations upon a small scale; and for such we often find a preferable substitute in clean, well-washed cotton batting, a small quantity of which is pressed into the neck of a common funnel, which then is filled with the liquid to be filtered. The cotton plug may be made as loose or firm as the filtering liquid demands; its dimensions, respectively to its depth, may also be increased or decreased at pleasure, liquids of great fluidity passing readily through a dense and deep cotton plug; while syrups filter only through a loose plug, unless pressure is applied. For this purpose, also, cotton is preferable, as considerable pressure can be used to increase the speed of filtration; while paper would not be strong enough to resist that pressure without especial care and precaution, such as using at the same time a filter of cotton cloth, which sustains the pressure, and upon which the paper filter lies, so as to make no folds, while the funnel which supports the filter must have exactly an angle of 45 degrees, so as to ensure the close adherence of the filter to the walls of the funnel. A small platinum cone may also be slipped over the joint of the filter, having the same angle, to add to its strength to sustain the pressure. The further construction of pressure-filters has been so fully a subject of discussion in the pharmaceutical press, that I may safely pass it by with the suggestion that tho simplest pressure-filter is a siphon, where filtration would take place upward through the short arm of the same. To do this successfully, the opening of this short arm must be very wide, narrowing down funnel-like to the tube, which should be of very small calibre. The difference in width between the short and the long arm must be very great, to render the siphon useful as a filter, for the reason that only a large opening closed by the obstructing filtering medium will admit through the latter a sufficiently large amount of liquid to keep the long arm of the siphon-tube filled. Should less than that amount of liquid pass through, air will enter and will at once disturb the action of tho siphon.

On a large scale the pharmacist rarely has occasion to use filters except in percolation, which perhaps hardly belongs within the scope of this paper, since filtration has simply the object of separating a liquid substance from a solid one, while percolation proper, in the customary pharmaceutical sense of the term, by means of filtration accomplishes also the extraction of soluble substances from the filtering medium. But the process being mainly one of filtration, your reporter ventures to present a few suggestions which he deems as applicable to pharmaceutical percolation as to filtration proper.

Filters or percolators should be constructed tall and narrow, so that the filtering or exhausting liquid should have to travel a great distance through a large mass of filtering material, or powdered drugs in the case of percolation, as only with the increased contact and surface the efficiency of a filter is increased. If of two filters of the same capacity, the one is twice as tall as the other, the tallest will be almost twice as effective, since in the shorter filter the liquid passes but half as long through the filtering material, withdrawing itself soon from the same, while each particle of liquid comes in contact with but half the quantity of filtering material, the paths which the filtering-liquid passes, being increased in number in the same ratio as they are decreased in length.

Although used in the arts for many years, the practical application of this principle in pharmacy is of but recent date; namely, the use of fractional percolation, an apparatus for the same, or a series of filters, being in fact no more than a long tall filter cut into many short filters for the sake of more convenient handling, and more convenient separation of the exhausted part of the filter in the first one of the series. Here I would beg leave to remark that various suggestions in regard to fractional percolation, dictating the exchange of different filters in an especial order, with retention of some of the first filtrate (percolate), prior to its passage through *all* of the filtering material (powdered drug) appears to me arbitrary, since no percolate, no matter how concentrated, is so strong but that its passage through some fresh portions of unused drugs would increase its strength, the active principle of that part of the drug being exhausted at the same time to some extent, thus rendering more complete the work of exhaustion of subsequent portions of filtering liquid.

Fractional percolation, no matter whether two or an indefinite number of filters are used, should be so conducted that *each* particle of the filtering-liquid would pass through *all* of the filtering material. This will ensure a thorough exhaustion of the filtering material, and a corresponding thorough purification (in the case of percolation through saturation) of the filtering liquid.

Another point worthy of consideration is the difference in the results between upward and downward filtration. In the latter, the liquid, following its own gravity only, will select those paths where it finds the least resistance, namely, *around* the single particles of the filtering material, which to a great extent it will leave untouched and therefore unused. In upward filtration, on the other hand, the passage of the liquid is guided by hydrostatic pressure in a straight upward direction regardless of resistance, and the filtering material is more thoroughly exhausted. For liquids of low specific gravity, like oils, this mode of filtration is well established, because the water used in displacing the last portions of the oil is quite effective, consequent upon the difference of the specific gravity of the two liquids. But if an extract, a syrup, or other liquid, heavier than water, is to be displaced by that liquid, a partial diffusion of the same through water will take place. This is quite trifling if the liquid is well followed up by the displacing fluid (water), but has been deemed sufficient by some to form an obstacle to the practical application of upward filtration.

In experiments made in this direction, your reporter found that syrup weighing thirty-five degrees Beaumé, displaced by water, soon yielded a filtrate of but two degrees Beaumé, if the filter was kept at a temperature of about ninety degrees F., to ensure fluidity of the syrup; the filtering material in this case was bone-black.

Where the thorough exhaustion of the last trace is of great significance, the filter, which for pharmaceutical purposes is rarely of great dimensions, might be made revolvable around an axis, so that top or bottom could be interchanged for the reception or discharge of the liquid filtered. Here the filtration might be carried on upwards, and the exhaustion of the filter downwards. Pressure filtration, as also that with the exclusion of air, can be carried on well and simply in the manner of upward filtration.

As to the material most useful for filtration to the pharmacist, I will mention besides filtering-paper, cotton batting for most ordinary liquids, for which might be substituted in many cases white clay, fuller's earth, when only turbidity is the motive for filtration.

In several instances it has come to the notice of your reporter that otherwise good pharmacists, who never would buy or make an inferior preparation, would filter liquids, like ferrated elixir of Calisaya, through large quantities of bone-black. The great absorbent power of bone-black was completely lost sight of. A plug of cotton batting would have been more appropriate. If bone-black is used for filtering pharmaceutical preparations, it should be completely freed from its phosphates by muriatic acid, the nitrogenous carbon remaining behind being a much more powerful substance for filtration (decolorization) than the ordinary bone-black, while it contains nothing soluble that would contaminate any pharmaceutical preparation.

For chromic acid, or similar oxidizing agents or caustics, the proper filtering medium is glass-powder or gun-cotton, while for the filtration of mercury a double layer of good chamois skin should be taken, and gentle pressure applied to effect the passage of the metal.—*Proceedings of the American Pharmaceutical Association.*

TESTING COCHINEAL.

BY J. M. MERRICK.

I give in the following article the outlines of the method I am in the habit of using for testing samples of cochineal to ascertain their comparative colouring powers. I have not seen it described in print, and while it is a much closer and more accurate method than that which is based upon dyeing strips of mordanted woollen stuffs, it is preferable to the bleaching with chloride of lime method,—as the oxidizing substance used, viz. potassic permanganate, does not precipitate the colouring matter of the cochineal.

I grind to a fine powder the samples to be tested, weigh out two or two and one-half grammes, and boil this amount in a capacious narrow-necked flask, with 750 c. c. of water, for one hour. The liquid is immediately filtered through dry paper filters, and tested when cold. To test it, 50 c. c. are measured in a flask of that capacity and poured into another flask of about 200 c. c., and the measuring vessel rinsed with a definite quantity of water, say 10–15 c. c.

A weak solution of permanganate is then run in from a burette with a glass cock, the flask being shaken well after the addition of every 10 c. c.

So much permanganate solution is added that the cochineal extract shall be changed from its original colour to a pink of the very faintest shade, almost yellow, in fact, but never reaching a full yellow. This pink shade should be persistent, that is, it should not turn yellow after standing fifteen minutes; and after a little practice it will be found very easy to obtain the tinge, which shows that the colouring matter is almost but not quite destroyed.

When a number of samples are to be compared I arrange an equal number of 200 c. c. flasks and test-tubes on the table, a tube standing in its rack in front of each flask. Then the *same* number of c. c. of the permanganate solution (which should be at least so weak that bulk for bulk of this and the cochineal solution will be required) is run into each flask, taking care to use too little to completely destroy the colouring matter in *all.*

The flasks are well shaken and allowed to stand for ten minutes.

Part of the contents of each is then poured into the corresponding test-tube, and a glance at the tubes as they stand side by side will show which is the least affected by the bleaching liquid. This sample having been selected to serve as a standard, the contents of the test-tube are returned to this flask, and more permanganate solution is cautiously added, until a very faint pink tinge, which a fraction of a c. c. will turn to a full yellow, is obtained.

The number of c. c. used having been noted, a fresh trial is made, in which the c. c. required, minus one, are used, the flask agitated, and the last c. c. or part of it, as the whole may not be necessary, added. If the two results agree, the next sample is treated in the same way, and so on until all are tested.

I usually make a final trial by measuring the 50 c. c. of each solution into its flask, running in the permanganate in the ascertained amount into each as quickly as possible, letting the flasks stand ten minutes, and then making a comparison of all in the test-tubes.

If the shades are not exactly alike, a pretty good guess can generally be made of the fractions of c. c. required, which should be added, the contents of the tubes being joined to that in the flasks, and a second or third comparison thus made.

This is a rather long description of what in practice is a very simple and good process, the three principal points to be borne in mind being,

1. To use a weak solution of permanganate.
2. To have a very faint pink colour as a standard of comparison.
3. To let the liquids remain after agitation together 10–15 minutes before comparing them.

I may add, that it is very remarkable how little can be told of the value of a sample of cochineal by a mere physical examination, and that the frequent inconsistency between value and price is equally surprising. I have known samples to differ *thirty* per cent. in colouring power, and only one or two cents per pound in price.—*American Chemist.*

TINCTURE OF HYOSCYAMUS.

BY M. DONOVAN.

Some years since I published, through the medium of the *Medical Press*, an account of trials made on myself and others, with a view to discover what dose of tincture of hyoscyamus should be given in order to produce its sedative effects. The experiment was made on several persons, beginning with a drachm dose, increasing it to six drachms, and in my own case to one ounce, of the tincture of the Dublin Pharmacopœia. In no case were any effects observed beyond dryness of the throat and fauces. The experiments were made with tinctures prepared from the dried leaves of garden-grown plants, from wild plants collected in a mountainous district of North Wales, and from the same leaves dried and undried.

I was under the impression that some of the plants employed in making the tinctures on which I experimented were in the second year of their growth, but the trials now to be described have convinced me that none of them could have been more than one year old. At that time I was not acquainted with the means which I have since discovered of testing the age of the plant.

I satisfied myself by these experiments that tincture of hyoscyamus prepared, as I believe it generally is in this country, from leaves of one year's growth, is all but powerless. I was strengthened in this opinion by finding that M. Hertz has given upwards of fifteen grains of the extract, most probably made from the plant in its first year, without any sensible effect.

Mr. Houlton had long before affirmed the inertness of the one-year-old plant, and the activity of that of two years old.

In order to come to some determination on this subject, I adopted means of procuring a tincture certainly made from the latter, and from trials with it soon convinced myself that it was an article of very different value from a tincture of the one-year-old plant, and that all my former experiments must have been made with the latter, although I was led to believe that, in some of them, the plant of two years' growth had been used.

My first trial was on myself. I took one drachm, and for an hour or two felt no effect beyond dryness of the mouth. On a subsequent occasion I took two drachms, and in two hours had proof that I had taken a sufficiency. My sensations were indescribable: one was a feeling of uncertainty of my steps in walking, although they were really quite steady, and a slight sensation of giddiness. This trial convinced me that I had taken as full a dose as prudence would permit. To a lady who suffered from headache I gave, at her own request, one drachm of this tincture. In about two hours she felt so overcome by sleepiness that she could scarcely keep her eyes open; the headache was, however, greatly relieved. On another occasion she took a similar dose, and, being in bed, she soon fell into "a delightful sleep," and, on awaking, found that the headache was almost gone; but she complained of dryness of the fauces and throat, although on the first occasion she did not experience either of these effects. Some months after the same lady suffered from headache, and did not receive any benefit from a similar dose; nor did another person experience any relief from toothache nor any other effect beyond slight dryness of the fauces, which soon passed off.

Convinced by the foregoing considerations that the medicinal properties of hyoscyamus reside exclusively in the plant of two years old, and that the plant of one year's growth is therefore useless, I sought to discover an easy test by which the age of the plant from which a given tincture had been prepared could be determined. The following has at least the advantage of simplicity: add a little of the tincture to a glass of water; if the mixture become slightly milky, the tincture was made from a two years old plant; if it remain transparent, the plant was in its first year.

The British Pharmacopœia gives no information as to what shall be the age of the hyoscyamus from which the tincture is to be made; it is, therefore, a matter of chance whether it will have any effect or be powerless. Given in the dose of twenty or thirty drops, as is sometimes done, it is hard to believe it can have any effect in either case.—*The Medical Press and Circular.*

YEAST AND OTHER FERMENTS.

BY C. A. WATKINS.

(*Continued from page* 888.)

When starch or sugar is transformed* into butyric acid, vibriones are sure to be found in the fluid, whether they produce this fermentation or not; and lately a most remarkable statement has been published by M. Béchamps regarding this matter. This gentleman asserts that he has discovered that there exist at the present time, in

* During the transformations which took place in these experiments, I detected no organism having the slightest resemblance to yeast; the only fungus being *Oidium lactis*, which does not grow in the fluid, and, in my opinion, has no reference to the fermentation. In all the instances in which lactic acid was formed, I noticed only bacteria or vibriones, and while I admit that under more favourable conditions of temperature other growths may appear, I do not consider any of these organisms to be the specific lactic acid ferment.

large blocks of chalk taken at a depth of 200 feet from the surface of the soil out of a tunnel driven in a mountain, large quantities of microscopic animalculæ, which he has named *Microzyma Cetæ;* and he also states that if some of this chalk be placed in a saccharine solution, lactic and butyric acid fermentation ensue.

Yeast is so well known that its description here is quite unnecessary, and the fact that it converts sugar into alcohol is patent to all. The chemical formula of this change is thus:—

$$\underset{\text{Grape Sugar.}}{C_{12}H_{12}O_{12}} = \underset{\text{Alcohol.}}{2C_4H_6O_2} + \underset{\text{Carbonic Acid.}}{4CO_2}$$

Yeast is supposed to be the conidial condition of *Penicillium glaucum*, but much light is required to be thrown on this matter to raise it from its present obscurity.

The yeast cells consist of an outer membrane of cellulin —the same material as the cellular tissue of other vegetables—in the interior of which is a highly complex gelatinous substance allied to albumen.

The appearance of yeast under the microscope varies considerably with its condition; when at rest, that is, when fermentation is arrested, its form varies from globular to ovoid, frequently with an uneven outline, as if the cells were very partially empty; but when they are put into a fresh solution of sugar they swell out, and during active fermentation appear globular or nearly so, and more transparent than before.

When yeast is added to brewer's wort it increases rapidly, and grows to six or eight times its original quantity during fermentation; the wort being a solution which contains in abundance the elements required for its development, namely, grape sugar and some albuminous substances derived from the malt and hops.

During fermentation these albuminous matters disappear from the solution in proportion to the development of the yeast, and the sugar also disappears in the same ratio. When the fermentation is complete, we find that in place of the complex albuminous matters in the wort, we have simpler chemical combinations, such as salts of ammonia, and in place of the sugar we have alcohol. These chemical changes take place simultaneously; but with this important difference, that the amount of nitrogen in the original wort is reduced by about one-half, while the alcohol and carbonic acid nearly correspond to the weight of the sugar, the remainder being converted into lactic acid, etc., a small quantity of which is always formed during vinous fermentation. But the yeast consisting almost entirely of albuminous matters, and having increased to several times its original quantity, fully accounts for the disappearance of so large a proportion of the nitrogen from the wort.

Thus it will be easily understood that yeast, in order to grow, must be supplied with some soluble azotized matter, such as albumen; and it is as easily proved that it will not grow without.

To ferment one hundred parts of sugar, one part of yeast is required; when the fermentation is complete, the yeast is exhausted, and in its place ammoniacal salts and cellulin are found. As the vinous fermentation takes place only during the growth of the yeast, it may be said that it will grow in simple saccharine solutions. In a certain sense this is correct, but such growth is degenerate and exhaustive, and not the healthy growth which increases and multiplies, for in such a solution the yeast positively lives on its own substance: this has been proved by Pasteur in the following manner:—"He took a quantity of washed yeast and divided it into two equal portions,—one of these was placed in a solution of pure sugar, the other portion was boiled in water, the decoction filtered, and the filtrate added to a similar solution of sugar, to which a very minute quantity of fresh yeast was added. In the first case twelve parts of sugar were converted into alcohol in six days, when the yeast became exhausted. In the second case the liquid became turbid; fresh yeast was formed at the expense of the azotized matter derived from the boiled yeast, and ten parts of sugar were fermented in nine days."

Some years ago, when experimenting on bread-making, I was much puzzled by finding that when the yeast was thoroughly washed the sponge did not rise so quickly, nor was the bread so light as when made with yeast as received from the brewery. I have since learned that a portion of the yeast is soluble in water, and that when it has been dissolved out by washing, the yeast is less active; on exposure to the atmosphere, however, it recovers its activity.

Yeast causes a curious and important change to take place when added to a solution of cane sugar, converting it into fruit sugar by causing it to combine with one equivalent of water, during which operation the solution increases in specific gravity. This transformation is attributed to the soluble portion of the yeast; but be this as it may, some of it is evidently destroyed by the process, as a larger proportion of yeast is required to convert cane sugar into alcohol than grape sugar. It is a fact scarcely known to brewers, who use it, that cane sugar cannot be fermented into alcohol; for although when yeast is added to a cane sugar solution the vinous fermentation eventually ensues, it nevertheless does not commence until the yeast, without any apparent change in itself, has transformed the whole of the cane sugar into fruit sugar. The progress of this transformation may be witnessed by polarized light: the cane sugar producing a right-hand rotation of the ray = 73°, while the fruit sugar causes a left-hand rotation of 26°.

I have one more observation to make in reference to yeast. When it has been kept some days, of course, according to temperature, it loses the pleasant smell it had when fresh, and acquires some fermentive properties, which, as far as I am aware, have not received much attention. It is well known to brewers that if the yeast be allowed to stand on the beer for a day or two after fermentation has been stopped, a very disagreeable effect is produced; the beer is not acetified, but the flavour is entirely changed; it is unpalatable, and the brewers call it yeast-bitten.

Now I am not in a position to throw any light on this change; but if stale yeast be examined with the microscope, there will be found interspersed among the ordinary cells a large number of minute globular bodies, which are generally in motion; and I have also noticed a larger proportion of short, straight vibrio-like bodies, than are to be found in yeast during active fermentation.

Whether these organisms produce the disagreeable effects referred to, I am unable to say, and merely point to them as one of the changes which take place in yeast when left to itself.

Diastase is a ferment, which has the property of converting starch into sugar, by causing it to assimilate the elements of water without evolving any gaseous products.

The transformation is represented thus:—

$$\underset{\text{Starch.}}{C_{12}H_{10}O_{10}} + \underset{\text{Water.}}{2HO} = \underset{\text{Sugar.}}{C_{12}H_{12}O_{12}}$$

Diastase is extracted from malt by soaking it in water, in which, at moderate temperature, it is soluble; it may be taken as the type of the ferments produced in all germinating seeds,—for as all seeds contain starch, which must be rendered soluble in the form of sugar before it can become food for the embryo—so they all contain some azotized matters, as albumen, gluten, etc., which are capable of passing into the form of a ferment, allied to diastase.

(*To be continued.*)

The Pharmaceutical Journal.

SATURDAY, MAY 13, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE COUNCIL ELECTION.

THE approaching Annual Meeting of the Society bids fair to rival that of last year in importance, though we trust it will be free from its disagreeable features. If we may judge from the letters of Mr. BALKWILL and Mr. ELLWOOD, there is likely to be no small difference of opinion as to the policy of the course taken by the Associations formed in reference to the question of Poison Regulations; and it is probable that those who are in favour of compulsory regulations will not be altogether silent when that question is brought forward.

As regards the election of Council, there is one point which we would earnestly press on the consideration of the Society at large, and that is the desirability of avoiding even the appearance of any feeling of personal antagonism. We do this because it is a thing that happens readily, though unintentionally, in discussion among earnest men who are really interested in the question at issue, and another reason why we do so is, the noteworthy fact that, although there were originally 45 nominations for the 14 vacancies on the Council, there are only 22 candidates for election.

We need not urge upon our readers the importance of having at command the services of competent and influential men for conducting the business of this Society, and the fact just referred to that so few have been found willing to accept office is, we think, one that should be regarded as a warning against manifestations of intemperate zeal, and as a cogent reason for the suppression of any proceedings calculated to render the office of a councillor one that is in any degree disagreeable or invidious. It is not long since that the Council of the Society was collectively denounced by a self-constituted authority as being "unworthy to occupy the position which has been delegated to it," while more recently the same anathema has been launched against an individual member of the Council because he dared to defend the opinions he held. But though such rhetoric may seem to outside factions a fitting means of obtaining influence, we trust the deliberations of the pharmaceutical body will always be animated by a more rational spirit.

THE CONVERSAZIONE.

AFTER the notices that have appeared in our advertising columns during the last few weeks, it is scarcely necessary to remind our readers of next week's entertainment at South Kensington. Each member of the Society is entitled to a card of admission for himself and a lady. Each Associate and Apprentice of the Society, and each Chemist and Druggist on the Register, may, on application, obtain a card of admission for himself. Cards of admission may be obtained on application to the SECRETARY, at 17, Bloomsbury Square. Some correspondence has reached us in reference to the dress that should be worn on the occasion, but we do not anticipate there will be any such difficulty on that score as to call for special directions. We may, however, state that it will probably be conducive to the comfort of visitors if, on this occasion, they lay aside the conventional "chimney-pot" hats, since the authorities of South Kensington decline to provide for their custody during the evening.

THE BENEVOLENT FUND.

THE publication in this number of the Journal of a list of contributions received towards the Benevolent Fund of the Society affords an opportunity of calling attention to the great inequality that exists in the amounts received from different parts of the kingdom. Of the total sum acknowledged, more than one-third has been contributed from London, which is greatly in excess of the proportion existing between the trade there and in the country.

That this does not altogether arise from indifference on the part of country members, but apparently rather from the absence of organization in many towns, would appear from the fact that while a few small places make a creditable return, some of the largest towns in the kingdom have contributed but a nominal sum. We must also take this opportunity of suggesting that contributions to this Fund, the benefits of which are available to the whole trade, should be very much more general than would appear to be the case, judging from the list of subscriptions which we now publish. Taking the trade in round numbers at ten thousand, the sum subscribed does not represent one shilling a head. This is a subject that might well engage the active attention of the Local Secretaries of the Society.

PROFESSOR BENTLEY will commence his Demonstrations on the parts of plants and the Natural Orders, at the Gardens of the Royal Botanic Society, on Friday morning next, at 8 o'clock. Students must apply to the SECRETARY, 17, Bloomsbury Square, for cards of admission.

MEDICAL PAPYRUS WITH ANCIENT PRESCRIPTIONS.

THE medical papyrus presented to the British Museum by the Royal Institution is about 7 ft. 6 in. long by 7 in. wide. It is unfortunately much mutilated, and has been considerably worm-eaten. The commencement is wanting, but its contents are a series of recipes or modes of cure for different maladies, unaccompanied by any diagnosis or account of the disease itself. The papyrus is written on both sides, and is a palimpsest, and on the endorsement is the commencement of a second series of cures for a malady, the nature of which is not known, but the remedy for which is said to have been miraculously found in an old book discovered in a hole in the wall of a certain temple by a priest. The book so found was written in the days of CHEOPS, the celebrated monarch of the 4th dynasty, and the builder of the great pyramid. The remedy for this malady consisted of incantations and prayers, and no drugs were employed. Other recipes are given for the eyes, both right and left. Amongst the drugs mentioned for some maladies are wax, fat, and incense. One remedy is for a stoppage of hæmorrhage from the head and other parts of the body,—shavings or twigs of acacia, grains of a substance called *kaspr*, to be burnt, also milk, branches of olive, the hair of a cat, and honey. One prescription orders the chapter to be said, and the breast to be rubbed with drops of the water of an animal called *tesh-tesh*, some extract of a material called *matn*, and wax and honey mixed with a preparation called *tart*. Another mixture was a preparation of sycomore and lizards. Fig leaves, gum, and excrementitious matter were also employed, and eked out with prayers and adjurations, but the meanings of the names of many of the substances are as yet not interpreted. This papyrus has not, like that of Berlin, the quantities attached, but many of the recipes date from an early period, as that of AMENOPHIS III. of the 18th dynasty. The papyrus is, however, very remarkable for its mention of these drugs at all, as some of the other medical ones known, as that of Leyden, have prayers and adjurations only.

A SOCIETY has lately been formed under the presidency of Mr. HENRY DEANE, F.L.S., with the title of the South London Microscopical and Natural History Club. It is proposed to hold its meetings monthly, so that by the delivery of lectures and the reading of papers, and occasional excursions into the country, a taste for the study of microscopy, zoology and botany may be developed among the members. It is also hoped eventually that a cabinet and herbarium may be formed, illustrative of the indigenous fauna and flora of East Surrey. The first meeting was held on April 1, at Gloucester Hall, Brixton. The annual subscription is fixed at ten shillings.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL,

May 3rd, 1871.

MR. HASELDEN, F.L.S., VICE-PRESIDENT, IN THE CHAIR.

Present—Messrs. Abraham, Atherton, Bottle, Bourdas, Carr, Dymond, Edwards, Evans, Groves, Hills, Sandford, Savage and Williams.

The Minutes of the last meeting were read and confirmed.

Mr. Haselden was elected President, in the place of Mr. Sandford, resigned.

It was moved by Mr. Edwards, seconded by Mr. Hills, and

Resolved unanimously—That the best thanks of this Council be given to Mr. George Webb Sandford for the very efficient manner in which he has always conducted the affairs of the Council, and they regret that any circumstance should have arisen to necessitate his retirement from a position so ably filled by him.

The Report of the House Committee was received and adopted.

The Report and recommendations of the Finance Committee were received and adopted.

The Report of the Library, Museum, and Laboratory Committee was received and adopted.

The Annual Report of the Council presented by this Committee, after careful consideration, was agreed to.

The Report of the Parliamentary Committee was received and adopted, and it was

Resolved—That the Registrar be authorized to erase from the Register the name of Catherine Forman, of Glasgow.

POISON REGULATIONS.

The Regulations to be submitted to the Annual Meeting of the Society for *voluntary* adoption, in conformity with the Resolution passed at the last meeting of the Council, were presented by the Committee appointed to revise them, and, with some amendments, were agreed to in the following form:—

1. That in the keeping of poisons each bottle, vessel, box or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

2. Also that in the keeping of poisons, each poison be kept on one or other of the following systems, viz.:—

(*a*) In a bottle or vessel tied over, capped, locked or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop or dispensary; or

(*b*) In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop or dispensary; or

(*c*) In a bottle, vessel, box or package kept in a room or cupboard set apart for dangerous articles.

3. That all liniments, embrocations and lotions containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

The Report of the Conversazione Committee was received and adopted.

Resolved—That the Registrar's Report presented at the March meeting of the Council be published in the next number of the Journal (6th May), as also the attendances of Council and Committees for the year 1870–71 to the present time.

The Secretary submitted the names of thirty-one Members and two Associates in Business who had tendered their subscriptions subsequent to the 30th April, and it was

Resolved—That they be restored to their former status on payment respectively of a fine of 1*s*., and that the Secretary be authorized to issue to each Member and Associate so restored voting-papers for the ensuing election.

REPORTS OF THE BOARDS OF EXAMINERS.

England.

1871.	Examination.	Candidates examined.	Candidates passed.	Candidates failed.
April 3	First, or Preliminary	294	165	129
„ 18 & 19	Major	4	3	1
„ 19	Minor	19	11	8
		317	179	138

Two Certificates were received in lieu of the First or Preliminary Examination.

Scotland.

1871.	Examination.	Candidates examined.	Candidates passed.	Candidates failed.
April 18	First, or Preliminary	8	7	1
„ „	Minor	8	4	4
„ „	Major	1	1	0
„ „	Modified	5	3	2
		22	15	7

Resolved—That the following having passed their respective examinations be elected "Associates in Business:"—

MINOR.

Chifney, Newton ....Lower Tooting.
Earnshaw, Benjamin King....Eastbourne.
Longley, John William ......Leeds.
Miller, Nathaniel ....Preston.
Pentney, James Chapman ....Norwich.

MODIFIED.

Bentley, John Nuttall........Heywood.
Bingley, Frederick Beavis ....Guildford.
Butler, Edward Henry ......Leicester.
Dawney, Charles ....Bath.
Harrison, Joseph James ......Market Harbro'.
Hiscock, Richard ....Coventry.
Laing, John Stewart ....New Cross.
Lunniss, James..............Holloway.
Shields, Robert James........Mexborough.
Slack, Josiah William........Wormley.

Resolved—That the following having passed their respective examinations be elected "Associates:"—

MAJOR.

Mason, Philip Henry ....Norwich.
Taylor, John William........Great Grimsby.

MINOR.

Baker, Samuel ....Chichester.
Gower, Alfred John..........Tonbridge.
Hackett, John Henry ....Lincoln.
Hannaford, William ....Peterborough.
Howorth, George Buxton ....Chertsey.
Hulme, Richard Gleave ......Hammersmith.
Lord, Frederick ....Boston.
Mackay, George Duncan ....Edinburgh.
Margetson, James F. ....Norwich.
Morgan, Richard ....London.
Pratt, Henry James..........Thirsk.
Ritson, George ....Sunderland.
Savory, Harry Banting ......Painswick.
Smith, Fuller ....King's Lynn.
Smith, William John ....Leicester.
Thomas, Thomas Rees........Llandovery.
White, William Henry ......London.
Young, John Rymor ....Warrington.

MODIFIED.

Cadby, Samuel Kittle ....Margate.
Lear, Charles ....London.
Martin, Amelius Hare........Paris.
Morgan, Philip Henry ......Bristol.
Saunders, Charles John Heath Bromley.
Sproat, Robert ....Derby.
Stokes, Walter Edward ......Sandgate.
Targett, Charles George......Salisbury.
Thomas, Horace Alfred ......Norwich.

A grant from the Benevolent Fund of £10 was made to an orphan daughter of a late member at Southampton, and also a grant of £10 to the widow of a deceased annuitant.

The Secretary was requested to publish in the Journal a list of contributors to the Benevolent Fund for the current year.

SUBSCRIPTIONS AND DONATIONS TO THE BENEVOLENT FUND FOR 1871.

LONDON.	Donation. £. s. d.	Subscription. £. s. d.
Allchin, Alfred, Richmond Road, Barnsbury		0 10 6
Allgood, Edmund J., 22, Belle Vue Terrace, Seven Sisters Road, N.		0 5 0
Anderson, Charles, 23, Lower Belgrave St., S.W.		1 1 0
Andrews, Frederick, 23, Leinster Terrace, W.		0 10 6
Applegate, Edwin, Upper Holloway, N.		0 10 6
Attwood, Alfred, 147, Cannon Street, E.C.		1 1 0
Bacon, J. T., per Mr. Mould, Moorgate St., E.C.		1 1 0
Balch, E., 14, Claremont Pl., N. Brixton, S.W.		0 5 0
Barnard, John, 338, Oxford Street, W.		1 1 0
Barnes, J. B. 1, Trevor Ter., Knightsbridge, S.W.		0 10 6
Barron, Frederick, 2, Bush Lane, E.C.		2 2 0
Bartlett, W., 1, Bretten Terrace, Chelsea, S.W.		0 10 6
Batchelor, C. J. H., 6, Nugent Terrace, N.W.		0 5 0
Bate, H., Thorne Road, South Lambeth, S.W.		0 10 6
Beddard, J., 46, Churton St. Belgrave Rd. S.W.		0 10 6
Bell, W. H., 96, Albany Street, N.W.		0 10 6
Bentley, Prof., 17, Bloomsbury Square, W.C.		1 1 0
Best, J., 11, Jonson's Place, Harrow Road		0 10 6
Betty, S. C., 6, Park St., Regent's Park, N.W.		0 10 6
Billing, Thomas, 143, New Bond Street, W.		0 10 6
Binge, T., Stockbridge Terrace, Pimlico, S.W.		0 10 6
Bird, Robert, 74, High Street, Clapham, S.W.		0 10 6
Bird, W. L., 42, Castle Street, Oxford Street		1 1 0
Bolton, T., 98, Queen's Road, Dalston, E.		0 5 0
Bourdas, Isaiah, 7, Pont Street, S.W.		1 1 0
Bourdas, Isaiah, jun., 48, Belgrave Road, S.W.		1 1 0
Bourdas, John, 7, Pont Street, S.W.		1 1 0
Bowden, E. and A., 13, Charles Street, S.W.		1 1 0
Bradley, J., Brondesbury Ter., Kilburn, N.W.		1 1 0
Bromley, Richard M., 3, Beckenham Place, Denmark Hill, S.E.		0 10 6
Brooks, C., Southville, Wandsworth Road, S.W.		0 10 6
Brown, H. F., 40, Aldersgate Street, E.C.		0 10 6
Buck, Thomas, 552, Kingsland Road, E.		0 10 6
Buckle, C. F., 77, Gray's Inn Road, W.C.		1 1 0
Bullen, T., 13, Hereford Rd., Bayswater, W.		0 10 6
Burden, Thomas, 6, Store Street, W.C.		0 10 6
Burgoyne, Burbidges and Co., 16, Coleman St.		2 2 0
Butt, Edward N., 13, Curzon Street, Mayfair		1 1 0
Chard, F. J., 39, Warwick St., Pimlico, S.W.		0 10 6
Cheetham, W. H., 22, Commerce Place, North Brixton, S.W.		0 10 6
"Chemists' Ball," Committee of		21 0 0
Chubb, James C., 102, St. John Street, E. C.		1 1 0
Churchyard, Robert L., 112, Camden Rd., N.W.		0 10 6
Clarke, Arthur H., 217, Edgware Road, W.		0 10 6

	Donation. £. s. d.	Subscription. £. s. d.
Coles, Ferdinand, 248, King's Road, S.W.		0 10 6
Coles, John W., Camberwell New Road, S.E.		0 10 6
Cooper, A., 18, Abingdon Ter., Kensington, W.		1 1 0
Constance, E., 37, Leadenhall Street, E.C.		0 10 6
Cooke, John, 126, Hoxton Street, N.		0 10 6
Cooper, W. H., 5, Andover Ter., Hornsey Rd.		0 10 6
Corbyn and Co., 300, Holborn, W.C.		1 1 0
Covell, W. M., 302, Mare Street, Hackney, E.		0 5 0
Cracknell, C., 217, Edgware Road, W.		2 2 0
Croyden, Charles, 37, Wigmore Street, W.		0 10 6
Cruse, J. C., 27, Canonbury Place, N.		0 5 0
Darby and Gosden, 140, Leadenhall St., E.C.		2 2 0
D'Aubney, Thomas, 82, Shepherdess Walk, N.		1 1 0
Davenport, J. T., 33, Great Russell St., W.C.		2 2 0
Davies, Wm., 292, Gray's Inn Road, W.C.		0 10 6
Davy, Yates, and Routledge, New Park St., S.E.		2 2 0
Deane, Henry, Clapham, S.W.		1 1 0
Dinneford and Co., 172, New Bond St., W.		2 2 0
Dismorr, Henry, 6, Store Street, W.C.		0 10 6
Doubell, J., Archer St., Notting Hill, W.		0 5 0
Dyson, W. B., 4, Gloucester Rd., S. Kensington		0 10 6
E. B., Hackney Road		0 5 0
Eade, George, 72, Goswell Road, E.C.		0 10 6
Elkington, E., 56, Grange Road, Bermondsey		1 1 0
Ellis, George H., 4, Finsbury Pavement, E.C.		0 10 6
Elvey, Thomas, 8, Halkin Street West		1 1 0
Evans, H. S., 60, Bartholomew Close, E.C.		1 1 0
Evans, J. H., 60, Bartholomew Close, E.C.		1 1 0
Eve, C., 59, High Street, Hampstead, N.W.		0 10 6
Faulconer, R. S., 270, Walworth Road, S.E.		1 1 0
Field, William, 83, Brompton Road, S.W.		1 1 0
Fincham, Robert, 57, Baker Street, W.		1 1 0
Fisher and Haselden, 18, Conduit Street, W.		1 1 0
Fitch, Robert O., South Hackney, E.		0 10 6
Footi, Richard R., Stockbridge Terrace, S.W.		0 10 6
Forrest, R., 20, Cork Street, Bond Street, W.		1 1 0
Fox, W., 109 and 111, Bethnal Green Rd., E.		1 1 0
Francis, G. B., 5, Coleman Street, E.C.		1 1 0
Froom, W. H., 75, Aldersgate Street, E.C.		1 1 0
Gadd, C., 1, Harleyford Rd., Vauxhall, S.W.		0 10 6
Gadd, Henry, High Street, Kingsland, E.		1 1 0
Gadd, R., 1, Harleyford Road, Vauxhall, S.W.		0 10 6
Gale, H., 3, Millbrook Place, Camden Town		0 10 6
Gale, Samuel, 338, Oxford Street, W.		1 1 0
Gaunt and Fuller, 221, Union Street, Southwark		0 10 6
Gedge, W. S., 90, St. John Street, E.C.		0 10 6
Glover, George, 19, Goodge Street, W.		1 1 0
Goddard, G. E., 37, Chapel Street, S.W.		1 1 0
Good, Thomas, 2, Minories, E.	1 1 0	
Goodwin, John, Lower Clapton, E.		1 1 0
Granger, Edwin John, Upper Clapton, E.		1 1 0
Gristock, T., 42, South St., Manchester Sq., W.		1 1 0
Grundy, T., 37, Leadenhall St., E.C.		0 10 6
Henty, H. M., 87, High Street, St. John's Wood		0 5 0
Herrings and Co., 40, Aldersgate Street, E.C.		2 2 0
Hickey, Evan L., 199, King's Road, Chelsea, S.W.		0 10 6
Hickley, Thomas P., 297, Edgware Road, W.		0 10 6
Hill, Arthur B., 11, Little Britain, E.C.		1 1 0
Hill, Arthur S., 11, Little Britain, E.C.		1 1 0
Hills, Thomas Hyde, 338, Oxford Street, W.		5 5 0
Hodgkinson, Charles, 127, Aldersgate St., E.C.		0 10 6
Hodgkinson, Stead and Treacher, 127, Aldersgate Street, E.C.		2 2 0
Hooper, Bartlett, 43, King William Street, E.C.		1 1 0
Hooper, L., 43, King William Street, E.C.		0 10 6
Hopkin, W. K., 5, New Cavendish Street, W.		1 1 0
Horncastle, John, 17, Craven Road, W.		0 10 6
Howden, Robert, 78, Gracechurch St., E.C.		1 1 0
Howell, Maurice, 61, High St., Peckham, S.E.		0 10 6
Hugill, John, 147, Cannon Street, E.C.		1 1 0
Humpage, Benjamin, Turnham Green, W.		0 10 6
Hunt, Charles, 29, Chapel Street, S.W.		0 10 6
Hunter, John, 22, High Street, Kensington, W.		0 5 0
Hyslop, J. Cahill, 54, New Church Street, W.		0 10 6
Ive, W., 2, Stanhope Ter., S. Kensington, S.W.		0 10 6
Jacks, Ebenezer, 161, Gower Street, W.C.		0 10 6
Jackson, James B., 89, Bishopsgate St. Within		1 1 0
Jeynes, G. W., 62, Princess St., Edgware Road		0 5 0
Johnson, Benjamin M., 70, Tottenham Ct. Rd., W.		0 10 6
Jones, Frederick, 175, Kentish Town Rd., N.W.		0 5 0
Jones, Frederick Wm., 11, Norton Folgate, E.		0 10 6
Jones, William, 8, Richmond Terrace, W.		0 5 0
Jones, W. O., 34, Cambridge Terrace, Cornwall Road, Notting Hill, W.		0 5 0
Kemp, Robert, 205, Holloway Road, N.		0 10 6
Kendall, Charles F., 126, Clapham Road, S.W.		0 10 6
Kent, Thomas, 226, Blackfriars Road, S.E.		0 10 6
Kent, Thomas R., 226, Blackfriars Road, S.E.		0 10 6
Kernot, George C., 3, Chrisp Street, Poplar, E.		0 10 6
King, Thomas W., 108, Crawford Street, W.		0 5 0
Knight, J., New Park Road, Brixton Hill, S.W.		0 10 6
Knott, Samuel, 15, Norton Folgate, E.		0 5 0
Lacey, Samuel, 21, Vassall Rd., N. Brixton, S.W.		0 2 6
Large, John H., 65, New North Road		0 10 6
Lawrence, Fredk., 383, Kentish Town Rd., N.W.		0 10 6
Lescher, Joseph S., 60, Bartholomew Close, E.C.		1 1 0
Lidwell, J. E., 130, High St., Notting Hill, W.		0 10 6
Linford, John S., 146, Holborn Bars, E.C.		0 10 6
Lockyer, George, Deptford, S.E.		0 10 6
Long, H., 48, High Street, Notting Hill, W.		1 1 0
McCulloch, F., 13, Hart St., Covent Gdn., W.C.		1 1 0
MacGeorge, William, 346, Essex Road, N.		1 1 0
Maitland, John, 10, Chester Pl., Hyde Park, W.		1 1 0
Marston, John Thomas, 105, London Wall		0 10 6
Matthews, William, 12, Wigmore Street, W.		0 10 6
Maw, Son and Thompson, 11, Aldersgate St., E.C.		2 2 0
Medcalf, E., Brixton		0 10 6
Meggeson, George		1 1 0
Merrell, J., 1, Queen's Ter., Camden Road, N.W.		1 1 0
Middleton, Francis, 338, Oxford Street, W.		1 1 0
Mitchell, John, 254, Upper Street, Islington, N.		0 10 6
Morgan, David, 25, Brecknock Road, N.		0 10 6
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Mundy, Alfred Octavius, 11, Norton Folgate, E.		0 10 6
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Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Twelfth General Meeting of this Association was held at the Royal Institution on Thursday evening, April 27th; the President, Mr. John Abraham, in the chair.

The following donations were announced:—Hooker's 'Student's Flora,' Tyndall 'On Sound,' Naquet's 'Modern Chemistry,' 'The Life and Letters of Faraday,' 2 vols., Tuson's 'Veterinary Pharmacopœia,' Roscoe's 'Spectrum Analysis,' Fresenius's 'Quantitative Analysis' (last edition), Williams's 'Chemical Manipulation,' Prior's 'British Plants,' 'The Homœopathic Pharmacopœia,' Miller's 'Chemistry' (last edition), 3 vols.: from the British Pharmaceutical Conference, Bell and Hills Fund—'Proceedings of the American Pharmaceutical Association at the Eighteenth Annual Meeting, held in Baltimore, September, 1870': from Professor Maisch, of Philadelphia—'The Chicago Pharmacist': from Mr. Ebert, Chicago—'The New York Druggists' Circular': from Mr. Mercer, Montreal—'The Pharmaceutical Journal': from the Society—'Journal of the Liverpool Polytechnic Society': from the Society.

The President informed the members that the Council had felt great difficulty in selecting suitable books for the appropriation of the Bell and Hills Fund, their Library being well supplied with many standard works; they had, therefore, solicited the assistance of Professor Attfield, who had kindly selected and sent down the books on the table. He was sure they would all agree with him that it was a very useful selection, and would prove a valuable addition to the Library, and that they would feel much indebted to Professor Attfield for his kindness. He would remind the members that the Committee of the British Pharmaceutical Conference were enabled to make this handsome donation through the thoughtful liberality of Mr. Thomas Hyde Hills, of London, honorary member of the Association.

Unanimous votes of thanks were voted to the donors for their valuable donations.

The paper for the evening was by Mr. A. Norman Tate, "Some Thoughts on Iron." The Secretary announced that he had received a communication from Mr. Tate, regretting his being compelled unexpectedly to go out of town.

A short discussion arose upon the safe keeping of poisons, after which the members adjourned.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

On Monday, 1st inst., the first of a series of lectures, intended to replace, during the summer months, the classes held throughout the winter, was given at the rooms of the above Society, by Mr. A. J. Caley, subject "The Tests of the Pharmacopœia."

The Lecturer began by stating that it was his intention to go through the reagents alphabetically, and to endeavour to maintain a simplicity in treating the subject which should adapt it to the comprehension of the youngest apprentice amongst them. After enlarging upon the paramount importance of cleanliness during the application of tests, and advising that the strength of the solutions employed should correspond to those ordered in the Pharmacopœia, the lecturer adduced several examples indicating the great care that had been taken in compiling the Pharmacopœia to provide means for the detection of adulteration. He then passed to the consideration of the reagents, explaining their sources and processes of manufacture, the purposes for which they are employed, and methods of application, at the same time noticing the origin of the various adulterants.

The subject was handled in a most able manner, and, being well illustrated by experiments, elicited frequent applause from the audience.

The meeting terminated with the usual vote of thanks.

MEETINGS FOR THE ENSUING WEEK.

Tuesday, May 16. ......*Royal Institution*, at 3 p.m.—"On Force and Energy." By Mr. C. Brooke.

Wednesday, May 17. ...*Pharmaceutical Society of Great Britain*, at 11 a.m. for 12: Annual Meeting. At 8 p.m.: Conversazione at South Kensington Museum.
Society of Arts, at 8 p.m.—"The Utilization of Prison Labour." By Captain E. F. Du Cane, R.E.

Thursday, May 18. ......*Royal Institution*, at 3 p.m.—"On Sound." By Professor Tyndall.
Chemical Society, at 8 p.m.—"On a New Double Salt of Thallium." By R. J. Friswell. "On a New Benzolic Derivative." By D. Armstrong.

Friday, May 19. ....*Royal Institution*, at 9 p.m.
Royal Botanic Society.—"Economic Botany." By Professor Bentley.

Obituary.

At Teignmouth, Devonshire, April 19th, Richard Bayly Cornelius, Pharmaceutical Chemist, aged twenty-seven.

Review.

Chemistry: General, Medical and Pharmaceutical, including the Chemistry of the U.S. Pharmacopœia. By John Attfield, Ph.D., F.C.S., etc. From the second and enlarged English edition. Revised by the Author. Philadelphia: Henry C. Lea. 1871.

We have already had occasion more than once to speak in terms of very high commendation of Professor Attfield's excellent manual. It is therefore a matter of little surprise to us that we are called upon to welcome its reappearance in a new dress from the other side of the Atlantic, notwithstanding that so little approbation is usually accorded by our American brethren to the productions of the old country.

So much success, however, has attended the use of the book in the English School of Pharmacy and generally among the pharmaceutical students of Great Britain, that we venture to predict for it a very wide circulation among the pharmacists of the United States. The general plan of the book we have before described in detail and it is now familiar to the majority of our readers. That plan we still look upon as excellent. We have no faith in any attempts to teach or to learn chemistry otherwise than by experiment, and in Dr. Attfield's Manual experiment is the leading and characteristic feature. Every theoretical conclusion is led up to and supported by a series of experiments, for the most part simple enough to be performed without difficulty by a novice, and requiring the employment of but little special apparatus.

We almost wish the author had thought good to extend and develope a little further the chapter on chemical philosophy, and also some of the theoretical considerations interspersed through his pages. Whilst entertaining all due appreciation of the enormous labour of which every page is witness, in the multitudes of formulæ, notes and references which are to be found therein, we venture to think it would have contributed to elevating the philosophical character of the book, without diminution of its usefulness, if some portions of it had presented less of the character of a dictionary. An earnest student will sometimes, with mistaken diligence, commit masses of this kind of matter to memory, and, as we have before observed, leave off with too large a notion of what he has learned, and too small a conception of what there is yet to acquire. Under the guidance of judicious teachers, however, this is not likely to interfere to any serious extent with the generally valuable qualities of the work.

In this American edition all necessary corrections seem to have been very carefully attended to. The headings of the sections are now in thick type, so as to very greatly facilitate reference. The chemistry of the Preparations and Materia Medica of the United States Pharmacopœia has been introduced side by side with that of the British Pharmacopœia, and evidently every care has been taken to render the book worthy of the reception which we feel sure it will meet with at the hands of the pharmacists of America.

The following journals have been received:—The 'British Medical Journal,' May 6; the 'Medical Times and Gazette,' May 6; the 'Lancet,' May 6; the 'Medical Press and Circular,' May 10; 'Nature,' May 4; the 'Chemical News,' May 5; 'Journal of the Society of Arts,' May 5; 'Gardeners' Chronicle,' May 6; the 'Grocer,' May 6; 'Produce Markets Review,' May 6; the 'English Mechanic,' May 5; 'Food Journal' for May; the 'Practitioner' for May; the 'Canadian Pharmaceutical Journal' for April.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department,* 17, *Bloomsbury Square, W.C., and not to the Publishers.*

[222.]—TINCTURA COLOCYNTHIDIS.—Mr. J. Whitfield sends a further communication on this subject, and, according to his request, we print here the formula given in the last edition of the Prussian Pharmacópœia:—

Colocynth (free from seeds), 8 parts by weight
Star Anise Fruit . . . . 1 part „
Alcohol, sp. gr. ·830 to ·834, 96 parts „
Maccrate for eight days.

[236.]—DISPENSING.—BROMIDE OF POTASSIUM. —In looking over the Journal this morning, my attention was directed to the replies to *J. H. G.'s* inquiries, and I am quite in accord with the Editor as to the British Pharmacopœia dose; but still I think that 80 grains three times daily is excessive, notwithstanding that much larger doses are given in practice than that sanctioned as the maximum of the B. P. I have seen it myself administered in 15 and 20 grain doses thrice daily, but I very much question the practice. Three distinct cases have come under my notice where such doses have produced a feeling as if the interior of the skull was being scraped. However, Dr. Ainstie, in the February number of the *Practitioner*, gives two cases where large doses were given; in the first 90 grains, and in the second 120 grains daily, with decided success. In both cases, smaller doses had been tried without benefit. I should certainly endeavour to communicate with the physician, or learn, if possible, some history of the case, before I should feel justified in dispensing so large a dose.—G. J. G.

[240.]—DISPENSING.—Further communications have been received from Mr. H. H. Pollard, Mr. A. Marshall and Mr. E. Skipper in reference to the prescription ordering sp. lavand.

We have no doubt that in this case the compound tincture was intended by the prescriber.—Ed. Pharm. Journ.

[241.]—WARTS.—"*Omega*" will find a very successful application in commercial chloride of ammonium. The wart should be first moistened with a little water, and then rubbed with a piece of the above, repeating it daily.—L. A. S. A.

[242.]—IODIDE OF STARCH POWDER.—*J. T. B.* will find the following formula serve his purpose:—

℞. Iodine Resublimed gr. xxiv
Sp. Vini Rect. ♏xxiv vel q. s.
Pulv. Amyli Pur. ℥j.

Rub the iodine to powder by means of the spirit; gradually add the starch, and triturate until the mass assumes a uniform colour.—L. A. S. A.

[243.]—HYPOCHLORIDE OF SULPHUR.—In most establishments, I believe a powder prepared in a similar manner to the following would be dispensed for "sulph. hypochlor.":—

"Into a vessel containing a thin layer of 'washed' sulphur let chlorine be passed, until the gas ceases to be absorbed."

The true hypochloride is a volatile liquid, obtained by passing a current of chlorine over "melted" sulphur, and distilling the liquid. This preparation is not so often used in ointments, etc., as the impregnated powder.—J. T. C.

Hypochloride of sulphur is prepared by spreading washed sulphur thinly on the bottom of a wooden box, or other chamber, and passing chlorine gas slowly over it until it ceases to be absorbed.—L. A. S. A.

[*** A more convenient apparatus for working on a small scale would be a wide glass tube.—Ed. Pharm. Journ.]

[244.]—LOVAGE.—*W. Clark* wishes for a recipe for making lovage.

[245.]—CLOVES CORDIAL.—A correspondent asks for a formula for the preparation of cloves cordial.

[246.]—INSECT POWDER.—Can any reader give me a good recipe for a powder to kill insects?—A. P. S.

[247.]—DISPENSING.—To-day the following prescription was brought to be dispensed:—

℞. Ferri et Quinæ Citr. ʒj
Amon. Sesquicarb. ʒij
Sp. Myristicæ ℥ss
Syr. Simpl. ℥ss.

M. A tablespoonful with a tablespoonful of lemon juice in a wineglassful of water effervescing.

Will some of your readers inform me of the best manner to dispense it, and what appearance it should present? I may add that ammonia was spelt with one *m*, and the *m* underlined.—Alfred Marshall.

[*** It seems to us that in this prescription the water was left out. Probably a six-ounce mixture was intended.—Ed. Pharm. Journ.]

[248.]—SIPHON BAROMETER TUBES.—Can any of your correspondents acquaint me with the best method for filling the siphon barometer tubes?—Hydrargyrum.

[249.]—BRILLIANT ELASTIC BOOT VARNISH.—I should be glad if any of your readers could furnish me with a good recipe for the above varnish for patent leather, etc., which can be sponged off.—C. H. H.

[250.]—CRYSTAL VARNISH.—Would you kindly, through the Pharmaceutical Journal, inform "*Indoctus*" how to make a good crystal varnish, such as is used in positive photographs?

Correspondence.

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

The Forthcoming Election of Council.

Sir,—I have received the enclosed circular from the Honorary Secretary of "The Chemists' Defence Association," Manchester.

No doubt all members of the Pharmaceutical Society have received a similar circular; it puts forward a list of candidates, backed by the Committee, for election, and I must say I consider it a highly objectionable and ill-advised document,—its originators, no doubt well-meaning individuals, attempting a most uncalled-for interference with the free exercise of the elective rights of the Society.

This proceeding is objectionable, because it attempts to create an *imperium in imperio.* It announces the existence of a supervising body, which endeavours to control the governing body of the Society.

It is objectionable because it is impertinent. The Society has never delegated any powers to this Committee, nor asked it to select a list in its behalf—not being appointed by the Society, it has no right to usurp the power of doing so, especially as it does so professedly to prejudge questions,—to warp the judgment and bind the votes of the future Council.

It is objectionable, because there are always a number of undecided men ready to vote for any list rather than to use their independent judgment; doubly so, because these loose voters, being aggregated, are likely to swamp independent ones. It cannot be denied that the candidates named on such a list, if elected, are mere nominees of a clique, and that at any time they could be influenced by a vote of the Committee which put them in.

Unless a counter list be issued this one may be carried, and if a counter one be issued it becomes a question of party spirit, and not as to the best men.

The attempt is therefore most vicious in the sense of unsound and bad, and I trust the Society will not be led by the nose by wire pullers, but will prefer managing its own affairs, electing its own rulers,—men of known capacity and worth,—and then trust its affairs to their hands rather than to that of a Committee whose members, thinking they know better than the Council, are bent upon reforming it according to their own crude and conceited notions.

F. P. Balkwill, M.P.S., F.L.S., etc.

Plymouth, May 4th, 1871.

Sir,—The London and Manchester Defence Associations have united in issuing a circular, in which they recommend to the constituency the names of certain gentlemen for election to the forthcoming Council.

The ground of their selection appears to be the views which these gentlemen are supposed to entertain upon the question of "poison regulations," though as there are those amongst them who voted for the compulsory nature of these regulations, the reason of their choice does not appear very clear. It is a misfortune that associations which have sprung up under special circumstances and for special objects, should attempt to direct events which have a wider significance; because, the compulsory character of these regulations being withdrawn and no ground of opposition to them being left, the claims of the various candidates ought to rest upon a broader basis than that of one question only, the significance of which has now nearly passed away.

It should also be remembered that other questions of importance to the welfare of pharmacy are impending, and that the very men required in the Council, the working members and the men elected as the representatives of provincial pharmacy, are those whom the combined associations would employ the powers given them for other purposes to exclude from its debates. An examination of the statement of attendance of members of the Council on committees shows, that whereas 4 of the Associations' favourites attended in all 25 committees, the 4 gentlemen they seek to keep out of the Council attended 139, as follows:—

Atherton	8	out of	24	meetings.
Brown	2	„	19	„
Mackay	6	„	37	„
Woolley	9	„	31	„
Total	25	„	111	„

Abraham	14	out of	51	meetings.
*Bourdas	50	„	63	„
Dymond	26	„	37	„
Sandford	49	„	80	„
Total	139		231	„

There is one question of the utmost importance that the associations fail to notice, viz. the admission of reporters to, and the publication of, the monthly proceedings of the Council. Had this measure been adopted by the Council a year ago, we should not now be again in the dark as to the sentiments of many members of the Council on other popular questions besides poison regulations; and it is probable that the opposition to these and to the proceedings of the Council in respect of them, would not have proceeded so far or have been so productive of personal recriminations, had the constituency and their representatives, by means of the inevitable criticism of the press, become better acquainted with each other.

Referring to the past action of the Council on the question of the publication of its proceedings, I find that at the meeting of Council, October 6th, 1869, the following resolution was moved by Mr. Dymond and seconded by Mr. Stoddart:—

"That as the universally expressed feeling of the Anniversary Meeting was in favour of the publicity of the proceedings of the Council of the Society, it is expedient that its proceedings be fully reported in the Pharmaceutical Journal, and that reporters desiring to represent other Journals be permitted, at the discretion of the Council, to be present, but that any portion of the proceedings which the Council shall declare to be unsuited for publication shall not be reported."

To this resolution an amendment was moved by Mr. Orridge and seconded by Mr. Squire, the object of which was to postpone and upset the resolution. The following voting then took place (see Journal, Vol. XI. page 255.)

For the Amendment—Messrs. Abraham, Bottle, Bourdas, Deane, Edwards, Haselden, Hills, Ince, Morson, Orridge, Sandford and Squire.

Against the Amendment—Messrs. Brady, Carteighe, Dymond, Savage, Stoddart, Williams.

The motion, was therefore lost, and the amendment retaining the secret sittings carried.

Again I find at the meeting of Council on June 1st, 1870, it was once more moved by Mr. Dymond and seconded by Mr. Stoddart:—

"That it is desirable at the commencement of the new series of the Pharmaceutical Journal, that the proceedings of the Council be more fully reported in that and other Journals, and that, under regulations, reporters be admitted to the meetings of Council."

To this resolution an amendment was again moved, but this time by Mr. Abrahams and seconded by Mr. Edwards, the object of which was to quash the motion. The following voting took place:—

For the Amendment—Messrs. Abraham, Atherton, Bottle, Bourdas, Deane, Edwards, Evans, Groves, Haselden, Hills and Sandford.

Against the Amendment—Messrs. Brady, Brown, Dymond, Reynolds, Savage, Stoddart and Woolley.

The motion was therefore again lost, and the amendment carried.

These facts speak for themselves. Let us hope, at any rate, that the constituency will support those men who have so persistently urged and voted for the publication of the Council's proceedings, and those who show by their attendance on committees a willingness to serve the Society's interests.

Michael John Ellwood.

Leominster, May 8th, 1871.

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* Our correspondent is here in error. Mr. Bourdas is not a candidate for election.—Ed. Ph. J.

The Poison Regulations.

Sir,—Previous to the Annual General Meeting next week, I wish, with your permission, to say a few words on the above.

Although much has been written on the subject, but little conclusion seems to have been arrived at, beyond losing to the Society one of the best Presidents it ever possessed, and I take leave to say the only sensible man on this subject at the Council table.

The opposition to the Poison Regulations was started and sustained by the very self-same party who opposed the Pharmacy Act in 1866, to wit, the party who are the adherents of the *Chemist and Druggist;* for, all opposition ceasing, that party and its exponent cease also; and it is so far unfortunate, that readers of that periodical are not, as a rule, readers of the Journal, and *vice versâ;* so that there has been no true communion of thought on the subject, and, therefore, no real expression of feeling of the profession in its entirety.

Feeling this I shall, if no one else is found to do so, bring the subject formally before the meeting on the 17th instant, in order that the question may receive a definite answer.

My reasons for deprecating the opposition that has been offered to the enforcement of these regulations are:—

1. That while all admit the necessity of regulations, and actually adopt them, yet, unaccountably enough, some object to them for no discoverable reason except that they are in future to be compulsory.

2. That the proposed regulations, while complying with the order of the Medical Council, and satisfying the public by clauses 1 and 2, virtually make the case our own, and ought to disarm all opposition from our own body by clause 3. For, while it might no doubt, in certain cases, be highly objectionable, if not impracticable, to use peculiar bottles and poison cupboards, yet no one could take the smallest objection to making the poison-containing vessel sensible to the *touch;* the remedy was the easiest conceivable, and applicable alike to bottles, casks and jars.

The turmoil that has arisen on this subject seems to me to be totally unreasonable, and utterly devoid of any sensible objections, equalled only by the disgraceful scene enacted at the General Meeting in May last year, which, with due deference to those who differ from me, I must say, is little calculated to raise a body of men who claim an educational qualification, and who have recently obtained a valuable Act of Parliament, in the esteem of either the medical profession or the public.

The only objection put forward at all worthy the name is, that the restrictions would not apply to medical men, but should they? Have they not, as a matter of fact, quite as much right to dispense their own medicines as to hand them over to the chemist to dispense for them? And does it not, as another fact, pay them better to do so?

I do not consider that the warning our Council received, that they had failed in fulfilling the provision of the Pharmacy Act relating to poisons, had no significance; we went to Parliament for a Bill, and Parliament who had had, be it remembered, the question of poisons before them for years, gave us a Bill, but a Bill having a poison clause; they, of course, not caring a jot for our ideas of vested interest and monopoly, but having simply the welfare of the public at heart.

And having got our Bill, which we did want, but containing a poison clause, which we did not want, what do we do? Why, our utmost to stultify all that the Society has done for the advancement of pharmacy during the last twenty years, by ignoring the most important clause in the Bill, arraying ourselves against the medical men, and showing to the public, by whom we live, that we care less for their safety and welfare than for our own pockets.

The question of poisons having been so prominently introduced, even by the daily papers, we could hardly have done anything that would have told so much in our favour as to have adopted these compulsory regulations.

But, Sir, the not improbable cause of much of the present opposition is, no doubt, to be found in the bad odour of the profession of a pharmacist at the present time; what with dispensing surgeons on the one hand, and co-operative stores on the other, surely the pharmacist is in great tribulation.

Still, that is no reason why he should stumble over a present imaginary grievance and forget the future good, and that good is only to be obtained by union, and a constant endeavour to raise his professional and social status as much as possible, so that when the change for the better does come, he may be in a position to reap the full benefit of it.

Above all, let us avoid even apparent contempt for our new Act, avoid anything tending to an unpleasant collision with the medical profession, and avoid all dissensions among ourselves, or, too late, we may find that Parliament, having given us the power of self-legislation, and seeing us incapable of using that power, ignores all future appeals, and quietly resigns us to the tender mercies of the Medical Council.

John H. Baldock.

Norwood, May 8th, 1871.

The Early Closing Question.

Sir,—Will you again allow me to make a few remarks with regard to "early closing"?

In last week's impression I noticed several letters referring to the one which you so kindly inserted for me, and at the conclusion of which I styled myself "Aspirant to the Major Qualification." Unfortunately, one of the gentlemen who wrote does not see the practicability of making early closing compulsory. I am sure that without compulsion we should only get a few to act up to the mark, as was the case before examinations were made compulsory. I am glad to see that this gentleman, who has passed the Major Examination, does not discountenance the movement altogether; and, I think, if he considers the matter he will see that there is not the slightest chance of the question being discussed by employers; whereas we have a faint hope of the compulsory system being adopted if we can only get the majority in our favour, which, I think, there is little doubt about, as, bearing directly on all, there will be no room to express dissatisfaction. The compulsory movement would be quite as practicable as the law which limits the hours of confinement of milliners and factory girls, also the Compulsory Education Act, both of which may be taken as examples. We know there will always be some persons who will only be too ready to throw cold water on matters of this kind, but we must disregard them, and make *nil desperandum* our motto.

Another thing I wish to mention is "Sunday work." We are too lenient and obliging to persons on Sunday when they come for a pennyworth of cough lozenges or a pound of linseed-meal which they may have forgotten to fetch on Saturday. Now, I ask, why should this be? Why should we be confined to the house for the bad memory and failings of the public? The fact is, that we are so ill-remunerated that we cannot show that independence which would have the desired effect, as may be seen in all other trades. Of course it would not do to send a person away, when we know that our neighbours will only be too pleased to serve them. They should not be served by anybody on Sunday; we could all then show a more independent spirit.

Allow me to say, in conclusion, that once these matters are considered and put into force, the great advantages and benefits derived therefrom will be clearly seen. I am sure if the Council would consider this early-closing question, it would reflect a much greater amount of credit than the most absurd poison question, about which so much has been said, and on which even now no satisfactory results have been arrived at.

I hope with "One who has Passed the Major Examination" the iron may be kept hot by striking.

London, W., May 6th, 1871. T. S. M.

Sir,—I would suggest that there is a difference between *late* and *long* hours. If chemists' assistants were capable of combination for such a purpose, long hours would be doomed. As it is, a little consideration on the part of principals would remove every grievance on this score.

After a five years' apprenticeship, during part of which business hours were from 6.30 A.M. until 10 P.M., and during the remainder from 7 A.M. until 9 P.M., it was, perhaps, natural that I should rebel against long hours. Hence, during an assistantship of twelve years I made it a rule to accept no situation involving more than twelve hours' work per diem, including meal times.

As a principal, circumstances necessitated the keeping of my shop open more than twelve hours a day (though still an hour and a half less than my neighbours); but it is my rule to demand of no one in my employment, whether assistants, apprentices or errand boys, more than twelve hours' work per diem, including meal times. The adoption of the principle of division of labour would meet the requirements of long hours of business (where such are necessary), and the demands of assistants for short hours of work.

May 8th, 1871. JUSTUS.

EXAMINATIONS.

Sir,—Where the shoe pinches it is only reasonable to expect the sufferer to cry out, and, if possible, remove the cause of the evil.

My opinion is that the Modified ought to test the practical capabilities of the candidate, and if (after passing the Modified) a man is not competent to pass the Minor, then I say the Modified Examination is a sham—a mere "delusion and snare."

If the Modified examination is not a guarantee of competence, why have that examination at all? I cannot see why men who have only passed the Modified should not be competent to enter for the Minor. They enjoy the same privileges as regards the dispensing and compounding of medicines as Pharmaceutical Chemists, and yet they are not considered competent to enter even for the Minor. Now, Sir, is not this absurd? Surely, if a man acquits himself to the satisfaction of the Examiners in the Modified, he need not be compelled to undergo a second ordeal by a Preliminary? If so, I repeat, the Modified examination is a mere farce, and no dependence can be placed on it.

Cannot this subject be brought before the Council or the Annual Meeting to be dealt with on its own merits?

There are always certain people in every community who carp at any little privileges they imagine their neighbour enjoys. But take the calm and unprejudiced opinion of our Council, and, I think, I may venture to predict that our request will be granted. By the tone of your article a fortnight ago, I think that you are not altogether against our proposals; and I am sure if you use your influence in our favour, it will go a long way towards furthering our object. We all know the readiness with which the PHARMACEUTICAL JOURNAL takes up arms in any good cause, and I trust we may in this instance reap the benefit of your co-operation. B. S.

Sir,—I think the reply you make to "Sympathetic" exactly meets the case.

If a young man cannot, or will not, qualify himself for the duties devolving upon him in the sphere of life he has chosen, he had better take to another calling where the standard of qualification is lower.

Not one word will I say against a youth having a good amount of education to begin with; and I do not think that any should enter the drug trade without being pretty well up in Latin, Arithmetic, etc. But with regard to those whose education has been neglected, let me say, only "put your shoulder to the wheel,"—adopt for your guidance the motto (affixed to a trade-mark which I frequently see) "Ora et labora," and you need fear nothing.

The writer of this letter entered the drug trade before even the foundation of the Pharmaceutical Society, and therefore no necessity to prepare for meeting an examination existed. He left school at the early age of fourteen to go apprentice, and certainly was not a prodigy in educational acquirements; nor was his career commenced under the most favourable circumstances—apprenticed in a county town, engaged from six in the morning until ten at night, employed two-thirds of the time in powdering, grinding paint, putting up casks of oil, stacking bath-bricks and other abnormal operations of a similar character,—"the pursuit of pharmaceutical knowledge under difficulties" was certainly a marked characteristic of his early experience.

Books on chemistry, pharmacy, etc. were scarce, dear and of very different style to the excellent manuals now so numerous. We had no journals, no schools of pharmacy (even in our largest cities), in fact no help of any sort. At all events I speak of things as I found them.

It is not pleasant to speak of one's own performances, but as the writer's name will not appear to this article, it can serve no purpose of vanity, if he had any. I may, therefore, say that although I have had a hand in teaching many, I have, so far as my own education is concerned, had no help except "self-help."

And yet in the few leisure hours I could steal from a very active life, I managed to acquire a pretty good knowledge of botany, materia medica and elementary chemistry, including qualitative analysis. As for my Latin, although hundreds of prescriptions passed through my hands, I do not remember ever meeting with one I could not translate.

I undertook the management of the laboratory in a large provincial business, where I was able to prepare the various chemicals and pharmaceutical preparations in a most satisfactory manner, and afterwards became senior dispenser and manager of the laboratory at one of the principal London hospitals.

Now, after saying all this, let me enter my sincere protest against the abominable system of late hours, so justly complained of by your various correspondents; it is as iniquitous as it is unnecessary. It is quite time this state of things was altered; the members of the trade have the remedy entirely in their own hands, and if a feeling of fraternity, instead of a spirit of jealousy, did but animate us, there would be no difficulty about the matter.

Wherever classes can be formed and pharmaceutical schools established, by all means let it be done,—let our young men have all the facilities for acquiring knowledge we can place in their way. But whether classes or no classes, with schools or without them, let our would-be students learn this one great truth, that Providence helps those who help themselves.

If the apprentices (in the neglected town) mentioned by "Justice" in your last impression, who have repeatedly failed in passing the Preliminary Examination, did but bear this in mind, they might avoid the risk of failure.

The fact is (I am speaking from every-day experience), the majority of our apprentices and assistants seem to desire to imbibe knowledge in the same way they take their meat and drink, by having it poured down their throat. There are a few noble exceptions, and these are workers, not complainers.

Let the most be made of the system of late hours, which so extensively and almost universally prevails; still, it is a great disgrace to young men who have served an apprenticeship of four or five years in a chemist's shop, to know so little of their business as is the case with far too many of them.

The following may, perhaps, be useful to "Sympathetic" and others. One of the cleverest young men it has been my lot to have in my employ, came to me as an improver at the age of nineteen; and he surprised me wonderfully by stating that he had scarcely ever been to school in his life, having been employed in field labour. At fourteen he went as errand-boy to a chemist; with part of his wages he bought a Latin and English Grammar, and paid a schoolmaster a trifle for giving him occasional lessons in Latin. He was with me two years, at the end of which time I obtained him a situation in a very first-class house, where, at the age of twenty-three, he became resident manager. Since then he has given up the drug trade and is now at college, where he last year obtained the highest number of marks for Greek and Latin, and above the average for Hebrew.

His brother (also an errand boy) followed in his footsteps and succeeded him as manager, where he now remains.

ONE WHO HAS KNOWN THE DRUG TRADE MORE THAN THIRTY YEARS.

Evening Dress.—We have received several letters on this subject, in which our correspondents express their opinion, that it is a duty to the Society, as well as to the fairer element of the Conversazione, that visitors should appear in "evening dress;" and they suggest that any one who may be in doubt as to what that should be had better refer to his tailor.

"*Spes.*"—The Board of Examiners occasionally decide that a candidate may present himself for re-examination in some special subject or subjects in which he has previously failed, but this is a matter quite at their discretion.

"*Chemicus.*"—In the present state of the law, it is not illegal to carry on a business in the manner indicated by you.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. T. S. Pellors, Mr. P. Howman, Mr. J. R. Jackson, C. H. H., F. C. S., T. S. M., J. T. C., J. S. B., M. P. S., T. B., A. Z., H. W. H., "Alpha." "A Country Chemist," "Cantharides" and "Botanist" have not complied with the rule as to anonymous correspondence.

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Continued from page* 883.)

Nat. Ord. SOLANACEÆ.

This Order of plants is well known for producing the most deadly poisons. In some genera the juice of the plant will be strongly deleterious, while the solids will be nutritious. It is so with the common potato. The water in which the tuber has been boiled and the juice of the shoots and leaves are very noxious, while whole nations use the boiled tuber as a common and wholesome food.

Hyoscyamus niger (Linn.).

This singular plant delights in waste, sandy places, and may be found at Aust, Shirehampton, Hanham and Clevedon.

Its clammy, sticky feel, with an oppressive, disagreeable odour, produces an unfavourable impression on the collector, which is, however, partly removed by its elegant yellow corolla, relieved by dark purple veins.

Authors have been undecided as to whether the biennial and annual plants should be regarded as distinct varieties, or the latter only a more mature growth of the former. Judging from the general anatomy of the plant, and the spectroscopic appearance of the juice, the latter is probably the true state of the case. At all events, the biennial is the only one that ought to be used for making the extract and tincture, both of which are very favourite preparations. One cwt. of the fresh leaves will produce six pounds of extract.

The microspectroscope will immediately decide whether the tincture has been made from the biennial plant. Five dark bands are distinctly seen, which are not visible in that from the annual. They are so well marked that the tinct. hyoscyami is a beautiful object for exhibition on a screen by the electric or oxyhydrogen light.

The Henbane seeds are very pretty objects for the binocular microscope. They are flattened, greyish-green, and marked with small reticulations resembling the balls used by schoolboys made with netted string.

The active properties of the Henbane are supposed to be due to hyoscyamin, an alkaloid existing in the plant as malate.

It in some degree resembles atropine in its action on the system, and has a peculiar soothing, tranquillizing effect, without many of the objectionable qualities of opium.

Hyoscyamin is most readily prepared from the seeds by exhaustion with alcohol and diluted sulphuric acid, when the alkaloid is removed by potassic carbonate and ether.

It crystallizes with difficulty in tufts of acicular crystals. When dry, it is inodorous, but when moistened gives off a tobacco-like odour. It is soluble in water, alcohol, and ether. It is decomposed by caustic alkalies like the alkaloids of all the solanaceous plants, as pointed out by Dr. Garrod, so that preparations of Henbane, Belladonna, Stramonium, or Tobacco should never be prescribed with liq. potassæ. Hyoscyamin is completely precipitated by tincture of iodine.

Solanum Dulcamara (Linn.).

This pretty climbing plant is very common in the hedges and conspicuous in the month of July with its potato-like flowers. The bright yellow pointed anthers project from the purple corolla, each segment of which is marked by two green spots at the base.

Dulcamara owes its active properties to a poisonous alkaloid named solanin ($C_{43}H_{71}NO_{16}$), which abounds in every part of the plant.

A very ready method for obtaining solanin on a small scale for microscopic observation, is to let a potato germinate in a dark cellar, when the etiolated shoots will proceed for a long distance towards the light. On macerating these colourless shoots with very dilute sulphuric acid, solanin may be precipitated from the filtered solution by a little warm ammonia. Care must be taken that the acid used be not too strong, or the alkaloid will be decomposed.

Another very good method is to add lime to the expressed juice of the potato germs, or berries of the Dulcamara, and exhaust the precipitate with alcohol. By evaporating a drop of the solution on a glass slip, very beautiful and characteristic crystals may be obtained. Under a high power they appear as slender, right-angled, four-sided prisms. Solanin is soluble in alcohol, but nearly insoluble in ether and water. With chromic acid a sky-blue colour is produced, with nitric acid a rose-red, and with sulphuric acid an orange-red, passing to a violet.

By the action of dilute hydrochloric and sulphuric acids, solanin is decomposed into solanidin ($C_{25}H_{41}NO$) and glucose.

$$\underbrace{C_{43}H_{71}NO_{16}}_{\text{Solanin.}} + 3H_2O = \underbrace{C_{25}H_{41}NO}_{\text{Solanidin.}} + 3\underbrace{(C_6H_{12}O_6)}_{\text{Glucose.}}.$$

Solanidin differs from solanin by being soluble in ether.

Strong hydrochloric acid converts solanin into another alkaloid, solanicine ($C_{50}H_{78}N_2O$). Zwenger, who was the discoverer, says it is nearly insoluble in alcohol, ether and water. It, however, requires further investigation.

Nat. Ord. SCROPHULARIACEÆ.

Only one of the many genera comprised in this group is employed medicinally, although the Figwort, Mullein and Eyebright were formerly in great request.

Except perhaps the *Mimulus moschatus*, so well known in gardens, every species is devoid of any aromatic flavour.

Digitalis purpurea (Linn.).

This handsome and attractive plant is found wherever the sandstone occurs, as at Brislington, Westbury, Leigh Woods and Ashton.

It derives its name from Digitabulum (a thimble), on account of the shape of its flowers, and was called by an old writer "Thimble-wort."

It was a favourite remedy of Dr. Withering, who largely used it in his own practice, and first drew the attention of physicians to its valuable properties.

> "The rapid pulse it can abate,
> The hectic flush can moderate,
> And blest by Him whose will is fate
> May give a lengthen'd day."

The Foxglove owes its peculiar sedative and diuretic properties to a glucoside, named digitalin

($C_{27}H_{45}O_{15}$). It is white, inodorous, and so intensely bitter that it can be distinctly tasted when dissolved in 200,000 parts of water. It is much more soluble in alcohol and ether.

When sulphuric acid is added to digitalin, it first blackens it and changes it into a brown liquid, afterwards becoming crimson. When this brown liquid is dropped into a small quantity of water it produces a rich green colour.

The dried leaves yield ·78 per cent., the seeds 3 per cent. and the seed-capsules ·3 per cent. of digitalin.

When digitalin is boiled with sulphuric acid, it is converted into glucose and another base, called digitaliretin, ($C_{15}H_{25}O_5$).

$$\underset{\text{Digitalin.}}{C_{27}H_{45}O_{15}} + 2\,H_2O = \underset{\text{Digitaliretin.}}{C_{15}H_{25}O_5} + 2\,(\underset{\text{Glucose.}}{C_6H_{12}O_6}).$$

M. Labourdais says that the digitalin may be removed from the infusion by animal charcoal, from which it may be recovered by means of boiling alcohol.

The Foxglove is said to contain a large number of bases and acids, but further researches are necessary.

(To be continued.)

ORIENTAL SPICES.

BY JAMES PATON,

Assistant-Keeper in the Museum of Science and Art, Edinburgh.

(Continued from page 902.)

Nutmegs and mace are the products of a tree, *Myristica moschata*, belonging to the Natural Order *Myristicaceæ*. The nutmeg-tree, which is diœcious, having the male or barren flowers on one tree, and the female fertile flowers on another, is described as in appearance somewhat like the clove, though rather loftier, averaging 30 but reaching to 50 feet. The leaves are shaped like those of the pear-tree, but larger and of a beautiful glossy green upper surface, and soft grey below. The fruit is exceedingly like a nectarine or large plum; but furrowed all round instead of on one side only, as in the case of the nectarine. When the fruit is ripe, this furrowed exterior, which is a thick fleshy covering, bursts open and discloses what is undoubtedly the most beautiful fruit in the world. Surrounding an oval nut of a dark coloured glossy surface, are seen the broad veins of mace, an arillus of the brightest vermilion. Within this glossy shell is the nutmeg of commerce, and the vermilion arillus is what we receive as yellow mace. Here is the quaint Sir Thomas Herbert's description of the fruit:—"The nut is clothed with a defensive husk like those of a baser quality, and resembles the thick rind of a walnut, but at full ripeness discovers her naked purity, and the mace chastely entwines (with a vermilion blush) her endeared fruit and sister, which hath a third coat, and both of them breathe out most pleasing smells. The mace in few days (like choice beauties), by the sun's flames, becomes tawny; yet in that complexion best pleases the rustic gatherer."

The nutmeg-trees are in constant bearing,—flowers and fruit in all stages of advancement, being at all times found on the same tree. But in its native haunts, there are three harvests from the tree annually, first in April, when the finest spice is gathered; next in the end of July, producing the largest quantity, and finally in November, which Mr. Crawford says is a supplementary gathering. A good tree yields steadily about 10 lb. of nutmegs and mace; but taking plantations overhead, including male and female trees, the produce will not exceed 4 lb.

The Dutch made the same strenuous efforts to limit the production of nutmegs which they applied to the clove-tree; but with this they had greater difficulty. Originally of somewhat wider distribution, they endeavoured to confine the trees to the three small islands forming the Banda group, and for that purpose organized annual expeditions for the extermination of all other trees. The efforts of two species of pigeon to spread the tree constantly baffled the watchfulness of the Dutchmen. The pigeons swallowed the nutmegs, the mace of which was easy of digestion; but the shell enclosing the nutmeg was too much even for the all-absorbing maws of pigeons; consequently they took their flight to neighbouring shores, and there safely planted the uninjured nutmegs, in defiance of the most stringent and threatening proclamations of the governor-general of the Dutch East Indies.

The Dutch guarded their nutmeg parks in Banda with greater jealousy than did the Hesperides their fabled golden apples. It was not till these islands passed first for a short time into the hands of the French under the first republic, and next into our own possession, till the settlement of the then existing European turmoils, that an opportunity was fairly afforded of attempting the propagation of the valued fruits away from these islands. The difficulty, though long apparently surmounted, has proved more insuperable than in the case of cloves; and it may be said that now no nutmegs are grown, on a commercial scale, beyond the east part of the Archipelago. Under our East India Company the first apparently successful introduction of nutmegs into the Straits settlements took place about the beginning of this century. The company expended great sums on the transport and care of the trees; but in their impatience at the little progress the plants appeared to make, they ordered the plantations to be abandoned or sold. They were handed over to private enterprise, and soon they began to yield productively. The commercial success was immense, and a nutmeg mania seized upon the inhabitants. Everywhere nutmeg-trees were planted; flower-gardens were dug up, and the prized trees, which were with no trouble to heap wealth upon their fortunate possessors, were substituted. The jungle was cleared and planted with nutmegs, and their overshadowing kanary trees, according to the most approved method, when in the height of the planting fever, a sickly yellow patch was seen on the topmost boughs of some of the hitherto flourishing trees. Steadily it descended, and steadily it spread; attacked plants were rooted out, and healthy ones stimulated with manures, yet the blight continued its deadly progress. Plantations were even cleared and renewed, and again the fatal patch appeared, and no power of man was able to stay its progress. A great revulsion then occurred; plantations were abandoned, and the fruit of many healthy trees was left to rot on the ground; the production steadily declined till it has well-nigh ceased; and now amidst the tangled hiding-places of the deadly snake, and the lair of the equally dreaded tiger, may be found many blasted stems, and some yet green and flourishing nutmeg-trees, marking the place where not long ago, with great care and trouble, the precious plants were eagerly tended.

Pepper stands on a somewhat different footing from any of the already noted spices. These are, at most, of the luxuries of this life; pepper we are almost warranted in putting in the higher category of necessities. While the consumption of the first described is chiefly confined to the wealthy and luxurious, and for many causes has been steadily declining, pepper is eagerly sought for by all classes, is in constantly increasing demand, and now of much greater commercial importance than all the rest combined.

Under the generic name pepper, are included the products of more than one species of plant. There is first and chiefly the black pepper plant, *Piper nigrum*, of the Natural Order *Piperaceæ*, from which the common white and black pepper of commerce are derived. Secondly, the long-pepper plant, *Chavica Roxburghii*, allied to and used like the former, but not largely imported to this country. And thirdly, Cayenne pepper, yielded by several species belonging to the *Solanaceæ*, or Deadly Nightshade Order, an Order most important, both for its dietetical and medicinal products.

The common pepper plant is a native of the Malabar or Western Coast of India, where it is found growing wild, and from thence it has long been naturalized in the western islands of the Archipelago, chiefly in Sumatra, and from these localities the supplies of the world are drawn; for though introduced to the West Indies, the product of the west has not been able to compete with that of the east. The pepper plant or vine, as it is called, from its appearance, is a twining plant, growing to a height of 25 feet, with dark green heart-shaped leaves, short brittle branches, and spiked fruit, which is first green, then red, and finally black. Our ordinary black pepper is produced from the berries in their red or not quite ripe state; white pepper, on the other hand, is prepared from the black or ripe seeds, by soaking in water for some days, and peeling off the dark husk. There is a likely enough story that instructions were at one time sent to the East India Company's servants to cultivate the white pepper plant rather than the black, as white pepper always commanded the best market. Two harvests are gathered yearly from the vines, an average yield per plant being scarcely half a pound. The Malabar pepper always commands the highest price in European markets.

We can only name the other spices which have their homes in the far East, and which have at one time or another figured in European commerce. Capsicums or chillies are the fruit of various species of *Capsicum*, and are now cultivated for both spices and pickles in all tropical regions. Singularly, notwithstanding the richness of the Indian Archipelago in rare and delicate spices, it is only the capsicum that is cared for and consumed by the natives. Ginger, turmeric and cardamoms all belong to the Order *Zingiberaceæ*. Ginger is now extensively cultivated in the West Indies and in tropical Africa, as well as in its widely extended native regions in the East. Turmeric, as a spice, we know chiefly through its share in the composition of curry-powders; and cardamoms, though anciently much appreciated by the Greeks and Romans, and still used as a spice in the East, have been by us entirely relegated to the province of a medicine. Various umbelliferous seeds have also always held a place among spices, several of them being peculiar to the East, but of these we may take no note in the meantime.

The following figures represent the imports and estimated value of the spices of 1869 in Britain:—

Cassia, 527,000 lb., value £25,000.
Cinnamon, 2,700,000 lb., value £327,000.*
Pepper, 18,000,000 lb., value £343,000.
Cloves, 4,800,000 lb., value £72,049.
Mace, 76,000 lb., value £10,556.
Nutmegs, 800,000 lb., value £57,000.

(To be continued.)

SOLUTION OF GUAIAC RESIN FOR MEDICINAL USE.†

BY JAMES T. SHINN, OF PHILADELPHIA.

There are two officinal liquid preparations of guaiac, the tincture and ammoniated tincture, both of which are perfect solutions of the drug, but are very disagreeable in taste when given alone, or even when diluted with four or five parts of water. The great desideratum is to find a menstruum which is a good solvent, readily miscible with water and palatable; and, although unsuccessful in this attempt, I will give some results of the experiments made.

Alcohol dissolves all the resinous portion of commercial guaiac, leaving from 20 to 25 per cent. of impurities, chiefly chips of the wood and sand; and the purified guaiac obtained by evaporating the alcohol from this solution is readily dissolved by its weight of that fluid. The officinal tincture (three ounces to a pint), will bear an equal volume of water or syrup and remain clear, and is miscible in any proportion with glycerine and liquor potassæ without producing turbidity.

Thinking a reduction in the amount of spirit might be an advantage, the following formula was tried:—

Take of Purified Guaiac ℥ij
Alcohol f℥iij
Solution of Potash f℥ij
Glycerin f℥xj.

Dissolve the guaiac in the alcohol, and add the solution of potash and glycerin.

This forms a clear and permanent solution, of pleasanter taste than the tincture when given alone, but when mixed with water producing about the same turbidity, and leaving the same acrid taste in the fauces. Glycerin does not mask this acridity so well as sugar, but the substitution of part syrup produced a precipitate of the resin.

Decidedly the most agreeable manner of administering guaiac in liquid form, so far as tried, is that of a syrup prepared as follows:—

Take of Guaiac ℥j
Solution of Potash f℥ss
Sugar ℥xiv
Water sufficient.

Macerate the guaiac in the solution of potash,

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* Ceylon cinnamon entered at 2*s.* 6*d.* per lb.; cinnamon from other parts at 3*d.* per lb.

† Paper read at the meeting of the American Pharmaceutical Association, in answer to the query, "What is the best and most eligible liquid form for the preparation and administration of guaiac resin?"

mixed with f℥ij of water, for two or three days; then percolate with water till 8 fluid ounces of liquid are obtained, in which dissolve the sugar.

This syrup is quite pleasant to the taste, and can be taken alone or mixed with water; it has been prescribed for several years by Dr. Ludlow, of Philadelphia, with decided benefit in cases of rheumatism, and can be given for a long period without exciting disgust.

The quantity of solution of potash may be doubled without rendering the syrup unpalatable, and thus would increase the amount of guaiac dissolved.—*Proc. Amer. Pharm. Assoc.* 1870.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

GLYCERINUM, $C_3H_8O_3$ or $C_3H_5(HO)_3$.—Glycerine is obtained from fats or fixed oils by one or other of several processes:—

1. In the manufacture of emp. plumbi (q. v.). The aqueous solution, separated from the plaster, is, if necessary, treated with a little sulphuretted hydrogen, to remove from it a small quantity of oxide of lead retained in solution. The precipitated sulphide of lead is removed by subsidence, and the clear liquid evaporated to a syrup.

2. By throwing steam previously heated to about 500° F. into heated fat contained in a boiler a distillate is obtained, which separates on standing into an aqueous solution of pure glycerine and an oily layer consisting of the acids of the fat. (Price's Glycerine.) Suppose stearine to have been the material employed:—

$$\underset{\text{Stearine.}}{C_3H_5 3C_{18}H_{35}O_2} + \underset{\text{Water.}}{3H.HO}$$
$$= \underset{\text{Glycerine.}}{C_3H_5 3HO} + \underset{\text{Stearic acid.}}{3HC_{18}H_{35}O_2}.$$

3. The spent leys from which hard soap has been separated contain a quantity of glycerine. Thus—

$$\underset{\text{Oleine.}}{C_3H_5 3C_{18}H_{33}O_2} + \underset{\text{Hydrate of Sodium.}}{3NaHO}$$
$$= \underset{\text{Glycerine.}}{C_3H_5 3HO} + \underset{\text{Oleate of sodium.}}{3NaC_{18}H_{33}O_2}.$$

This is now recovered in some works by neutralizing the alkaline liquid by an acid, evaporating to a low bulk, and distilling the residue in a current of steam.

Pure glycerine should be colourless and odourless, sp. gr. 1·25 (B.P.). The glycerine of the Pharmacopœia contains a small percentage of water. Much of the glycerine of commerce, particularly the foreign, which is generally made by the lead-plaster process, contains chlorides of sodium and calcium, and will not therefore form a clear mixture with nitrate of silver. Glycerine is readily oxidizable, and is therefore incompatible with such agents as permanganates. It is slightly volatile at the boiling-point of water, but cannot be distilled in the ordinary way without much decomposition, intensely irritating vapours of acrolein being evolved. It may, however, be distilled without change in a current of superheated steam or in a partial vacuum. The vapour of glycerine is inflammable. Glycerine, as shown by the formula $C_3H_5(HO)_3$, is the hydrate of a trivalent radicle. The action of acids upon it gives rise to the formation of salts (of which the fats are examples) analogous to the compound ethers formed from ordinary alcohol,—the difference between them being that, whereas ordinary alcohol is the hydrate of a *uni*valent hydrocarbon, it can form with a monobasic acid only one such compound, as acetic ether, $C_2H_5 . C_2H_3O_2$.

Glycerine, being the hydrate of a *tri*valent hydrocarbon, may form with such an acid as acetic or stearic three different compounds.

Glycerine	$(C_3H_5)'''(HO)_3$.
Glyceryl mono-acetate .	$(C_3H_5)'''(HO)_2C_2H_3O_2$.
„ di-acetate . .	$(C_3H_5)'''(HO)(C_2H_3O_2)_2$.
„ tri-acetate . .	$(C_3H_5)'''(C_2H_3O_2)_3$.
„ mono-stearate.	$(C_3H_5)'''(HO)_2C_{18}H_{35}O_2$.
„ di-stearate . .	$(C_3H_5)'''(HO)(C_{18}H_{35}O_2)_2$.
„ tri-stearate .	$(C_3H_5)'''(C_{18}H_{33}O_2)_3$.
(Common stearine.)	

The relation of glycerine to oil of mustard is interesting. When distilled with biniodide of phosphorus, it yields the iodide of a radicle containing the same elements as glyceryl, but univalent.

$$2C_3H_5 3HO + P_2I_4$$
$$= \underset{\text{Iodide of allyl.}}{2C_3H_5I} + \underset{\text{Phosphorous acid.}}{2PHO(HO)_2} + I_2.$$

And this iodide, digested with sulphocyanide of potassium, yields mustard-oil and iodide of potassium.

$$C_3H_5I + KNCS = KI + \underset{\text{Mustard oil.}}{(C_3H_5)N(CS)''}.$$

HYDRARGYRI IODIDUM RUBRUM.

Four parts of perchloride of mercury are dissolved in boiling distilled water and mixed with five parts of iodide of potassium similarly dissolved. The scarlet precipitate is collected, washed and dried at 212°.

$$HgCl_2 + 2KI = HgI_2 + 2KCl.$$

In the process of precipitating the iodine, a salmon-coloured precipitate is first thrown down; this is a compound of iodide and chloride, which is changed by the further addition of iodide of potassium into pure iodide. An excess of iodide of potassium causes the precipitate to disappear.

It may also be prepared by rubbing together in a mortar mercury and iodine in the proportions represented by the formula.

$$\begin{array}{ccccc} Hg & + & I_2 & = & HgI_2 \\ 200 & + & 127\times 2 & & 454 \end{array}$$

Red iodide of mercury is almost absolutely insoluble in water, but is slightly soluble in alcohol, freely so in ether, and in a solution of iodide of potassium, forming in the last case a double salt, HgI_2KI.

It is also dissolved by hydrochloric acid, common salt, sal ammoniac and by a solution of corrosive sublimate, in which case it gives a double iodo-chloride, $HgI_2 2HgCl_2$.

One of its most curious properties is that of changing into a yellow allotropic modification when heated gently. When sublimed it forms magnificent thin prismatic crystals, which, whilst warm and undisturbed, are yellow, but resume the red colour spontaneously after a time, or immediately on being rubbed.

Specific gravity of vapour

$$\frac{200 + 2(127)}{2} \times \cdot 0693 = 227 \times \cdot 0693 = 15\cdot 73.$$

(See Ether.)

Hydrargyri Iodidum Viride.

200 parts of metallic mercury are triturated with 127 parts of iodine, and the combination is assisted by moistening with a small quantity of spirit, the use of which also prevents the development of heat. In the Pharmacopœia 1 ounce (=437·5 grains) of mercury is employed with 278 grains of iodine; these proportions are almost identical with those given above, which are the numbers theoretically required. The product of the official process is a dull greyish-green powder, which is directed to be dried in a dark room on filtering paper, without heat.

This substance is very liable to variation in properties and composition.

When prepared according to directions, the green powder is a mixture of red or mercuric iodide, mercurous iodide and metallic mercury; combination is incomplete. But when the trituration is continued, mixture becomes yellow, and then assumes the character of true mercurous iodide HgI. It changes in colour upon exposure to light, and when heated so as to cause sublimation, is resolved for the most part into metallic mercury and the red iodide.

YEAST AND OTHER FERMENTS.

BY C. A. WATKINS.

(*Continued from page* 908.)

The action of diastase on starch is so well described in all chemical works which treat of the vegetable products, that it seems strange any one should attribute the conversion of starch into sugar, during germination, to any other cause, without assigning some sound reason. Yet, in a popular book by Dr. Carpenter, on 'Vegetable Physiology,' published a few years ago, he says:—"Starch differs but little from sugar, in chemical composition, except in containing one additional proportion of carbon. When germination commences, oxygen is absorbed by the seed in the substance of which it combines with the carbon that is to be set free from it; and a large quantity of carbonic acid is then given forth again to the air, whilst in the same proportion, the starch is converted into sugar."

This implies that the conversion of the starch into sugar, and the evolution of CO_2 gas in germination, are the results of the same process; but if you will refer to my diagram, you will see that starch does not contain an additional proportion of carbon, as compared with sugar, but that it requires two equivalents of HO to equal it; and that were one or two equivalents of carbon to be oxidized and abstracted, we should not have sugar as the result.

It is a well-known fact that in germination the starch is converted into sugar by the diastase, which is probably formed from the azotized matters by the vital action of the embryo. The oxidation of some of the carbon contained in the seed is more likely to be due to the decomposition of the sugar and other matters by the growth of the embryo, the cells of which appear to me to perform chemical functions similar to some of the fungi, for at this period of its growth it must be remembered the vegetable action is reversed, that it is now living on organic compounds and evolving CO_2 gas; whereas, when it has expanded its leaves to the light and atmosphere, its food must be reduced to simpler forms before it can assimilate it, and it will then construct organic compounds and decompose CO_2 gas, eliminating oxygen.

Malt contains about $\frac{1}{500}$th part of its weight of diastase, and as one part of diastase will convert 2000 parts of starch into sugar, it evidently contains a much larger quantity than is necessary for the conversion of the remaining starch in the grain. This is taken advantage of in various ways by distillers, etc., for the purpose of converting unmalted grain and starch from other sources into sugar.

The action of diastase and other similar soluble ferments is supposed to be instantaneous when the matters on which they act are also made soluble.

As an illustration of this, I will tell you what is done at one of the large distilleries in the North.

Starch and grain are ground into a fine powder and put into a mash tun capable of holding several hundred quarters, and heated till the starch granules burst, and a thick paste is formed. When at the proper temperature, an infusion of malt is run in and agitated, and in about two minutes the whole of this stiff mass becomes perfectly fluid, the starch being at once converted into sugar by the diastase in the infusion.

In the instances of fermentation I have brought to your notice I have shown only the chemical transformations of the matters fermented, these changes resulting in the rearrangement of the atoms or the molecules of which those matters are built up, thereby giving rise to entirely new structures.

The ferments themselves suffer differently, being always reduced to the simplest combinations.

Looking at the result of a fermentation, it would appear that the ferment and the matter fermented did not enter into combination, but that its transformation is due to the force generated in the decomposition of the ferment with which it is in contact. It is, however, clear that the changes which take place in the two substances are collateral, for the same ferment will produce various chemical transformations of a substance according to the phase of its own decomposition. "Thus diastase, when fresh, converts starch into sugar; if kept for a few days, it converts it into gum instead of sugar; while at another period it converts the starch first into sugar, and then transforms it into lactic acid."

Therefore the transformations always depend on, and are relative to, the peculiar changes which take place in the ferment.

The commercial production of vinegar appears to be due to the agency of one or more microscopic organisms, the mass being called the vinegar plant, which, as I have said, is not regarded as a true ferment by chemists, and for this reason: all the ferments proper, such as I have described, produce the transformations entirely within the solutions, receiving nothing from, nor imparting anything thereto; but the conversion of alcohol into vinegar is a case of simple oxidation, in which the oxygen is derived from the atmosphere, each equivalent of alcohol absorbing four equivalents of oxygen to become acetic acid, according to the following formula:—

$$\underset{\text{Alcohol.}}{C_4H_6O_2} + 2O = \underset{\text{Aldehyd.}}{C_4H_4O_2} + \underset{\text{Water.}}{2HO}$$

$$\underset{\text{Aldehyd.}}{C_4H_4O_2} + 2O = \underset{\text{Acetic Acid.}}{C_4H_3O_3} + HO$$

In countries where no duty is imposed on the manufacture of alcohol, it can be made into vinegar cheaply and rapidly. The alcohol diluted with water, and a small quantity of some azotized substance added, is allowed to trickle over beech shavings placed in a vat, so arranged that a current of air circulates freely throughout.

For some days the process goes on very slowly; but the shavings become gradually covered with a slimy fungus, called mother of vinegar, and then acetification proceeds much more rapidly.

Pure dilute alcohol, exposed to the air, undergoes no chemical change, and its conversion into vinegar is undoubtedly due to some complex action of the growth of the fungus on the matters in solution; but the exact chemical operations of this vegetation are unknown.

Since writing the above my attention has been called to some observations on this plant by Mr. Slack (vol. v. p. 2), and published in the 'Microscopical Transactions.' He states, and I have no doubt of the truth of the assertion, that, "If some of the gelatinous portion of the plant be examined with high powers, it will be found to contain millions of minute bodies, resembling bacteria, some of them not exceeding $\frac{1}{16000}$th of an inch in length."

I have recently examined a dilute solution of alcohol, which is being converted into vinegar, and find these bacteria in abundance. They may be seen distinctly when magnified 250 diameters, though a high power must be used to resolve their structure.

The study of these minute organisms, though very uninviting to the general microscopist, would richly reward any patient investigator; for until we know more of the chemical processes which take place in and through them, the subject of putrefactive decomposition must remain a blank, as it is at present.

The vinegar plant and yeast are said to be different conditions of the same vegetation; the Brothers Tulasne have shown us that these lower species of vegetation pass through various phases during their growth, each having previously been considered as a distinct plant; and I see no reason why these minute organisms should not produce different chemical combinations at the different stages of their development, since we see, in the higher order of certain plants, that some of their chemical processes are reversed at points of their existence, namely, during germination, flowering and the ripening of the fruit, when they absorb oxygen and give off carbonic acid to the atmosphere.

In conclusion, allow me to observe that I am fully aware of having written a paper with a very slender knowledge of the microscopic organisms, whose chemical operations I have discussed; therefore I hope those parts which I have left in darkness will now receive the light of your experience and knowledge as microscopists. I am very anxious to obtain information concerning the part which those minute vibriones and bacteria play in nature's economy, for there can be no doubt that those remarkable bodies, appearing everywhere and springing into active existence almost at a moment's notice, must perform some important part in many of the changes which surround us.—*Journal of the Quekett Microscopical Club.*

THE USE OF ANIMAL CHARCOAL FOR THE PURIFICATION OF SACCHARINE SOLUTIONS IN POLARIMETRICAL ANALYSIS.

(*From the French of Dr. Stammer.*)

A certain quantity of animal black, in powder or in grist, is often employed to decolour and purify saccharine solutions intended for polarimetrical analysis. It is true that some chemists avoid this use of char, in which they think they see a cause of error; but it is generally admitted that in these conditions the char does not absorb the sugar, and therefore does not affect the results.

As this opinion does not appear to have been based on special experiment, M. Scheibler, in concert with M. Daunal, undertook a series of researches on the absorption of sugar in the treatment of saccharine solutions by means of char, which have placed beyond doubt the fact of this absorption in such a way as to prevent, henceforth, the use of this method of clarification for exact analysis.

The following tables contain the results of some experiments, in which different sorts of sugar have been used. The proper quantity of these sugars was dissolved in 50 cubic centimetres of water, and purified in the ordinary way by means of acetate of lead (except the samples marked by an asterisk in the table), and first examined in the polariscope. The same solution was then mixed with the quantity of powdered char shown in the third column of the table, and the action prolonged during the time indicated in the fourth column. The filtered solution, decoloured, was polarized afresh, and the proportion absorbed calculated. It is needless to say that every possible precaution was taken to prevent any cause of inaccuracy; consequently, the results are entirely conclusive.

It will be seen that the char absorbed some sugar in every case, and that the quantity absorbed was proportionate to the quantity of char employed.

Some hours' contact sufficed to render the absorption sensible. The previous clarification by acetate of lead, and the degree of purity of the sugars, appear to have had no influence.

TABLE I.—*Absorption of Pure Sugar by Char. Dried to 230° F.*

Sugar employed in experiment.	Degree of Polarization. Before treatment by char in percentages.	Degree of Polarization. After treatment by char in percentages.	Quantity of char employed.—Grammes.	Time of contact with the char.—Hours.	Proportion of sugar absorbed per cent. of sugar.
Pure sugar . . .	100·00	99·8	5·5	23	0·2
Sugar in crystals.	99·7	99·3	5·5	24	0·4
Raw sugar, No. 1	91·5	91·15	5·5	3	0·35
" " 2	94·2	93·8	5·5	18	0·4
" " 3	90·8	90·4	5·5	24	0·4
" " 4	95·4	94·65	5·5	20	0·45
" " 5	93·45	93·0	5·5	24	0·45
" " 6	91·8	91·5	5·5	24	0·3
" " 7	95·8	95·45	5·5	16	0·35
Masse d'empli, 1st product .	82·35	81·95	5·5	18	0·4

TABLE II.—*Absorption of Pure Sugar by Char. Dried to 320° F.*

Sugar employed in experiment.	Degree of Polarization. Before treatment by char in percentages.	Degree of Polarization. After treatment by char in percentages.	Quantity of char employed.—Grammes.	Time of contact with the char.—Hours.	Proportion of sugar absorbed per cent. of sugar.
Pure sugar . . .	100·0*	99·55	5·5	16	0·45
Sugar in crystals.	99·75*	99·3	5·5	16	0·45
Raw sugar, No. 1	97·25*	96·75	5·5	16	0·5
" " 2	93·1	92·5	5·5	3–12	0·6
" " 3	93·1	91·9	11·0	3–12	1·2
" " 4	91·75	91·2	5·5	16	0·55
" " 5	98·4*	98·2	5·5	16	0·2
" " 6	99·0*	98·45	5·5	16	0·55
" " 7	98·4	97·8	5·5	16	0·6
" " 8	92·1	91·0	11·0	16	1·1
" " 9	93·2	92·2	11·0	16	1·0
" " 10	91·8	90·8	15·0	16	1·0
" " 11	97·3*	97·1	5·5	16	0·2
Masse d'empli, 1st product .	83·3	82·9	5·5	16	0·4

We must conclude from these results that the use of char in analyses of sugars is not allowable, and that the general opinion on the non-absorption of sugar is erroneous.

[That char will absorb a proportion of sugar is conclusively proved by the above experiments; therefore, in every exact analysis, its use should be avoided, if possible. But, in the analysis of low raw sugar, subacetate of lead will not sufficiently decolour the sugar solution for the disk to be plainly visible through the solution placed in the tube of the polariscope. The use of char is then necessary, but the char will in a short time become saturated with sugar from the solution flowing through it, and, in fact, only that portion which runs through first will be much affected; so that the only precaution necessary is to run off a quantity of the solution through the char, sufficient to saturate it with sugar before filling the tube of the polariscope. That the quantity necessary for saturation may be easily ascertained is shown in the following experiment:—

A solution of pure loaf sugar, of the ordinary density for examination by Soleil's polariscope, was filtered through 130 cubic centimetres of new char of $\frac{16}{20}$ grist.

	Degree of Polarization.
Before filtration	100·
1st 25 c.c. of filtered solution .	88·9
2nd 25 c.c. ,, ,, .	97·9
3rd 25 c.c. ,, ,, .	99·7
4th 25 c.c. ,, ,, .	100·

It will thus be seen that it was needful to run off three times the quantity of sugar solution contained by the tube of the polariscope before the filtered solution gave results unaffected by the absorptive power of char.—Ed. S. C.]—*American Chemist, from the 'Sugar Cane.'*

THE PREPARATION OF FERRIDCYANIDE OF POTASSIUM.

BY WILLIAM T. WENZELL.

Ferridcyanide of potassium is usually prepared by the process of Gmelin, the discoverer of this salt, by passing chlorine slowly into a dilute solution of yellow prussiate of potash, until the liquid ceases to yield a precipitate on the addition of a persalt of iron. The chemical reaction which takes place in this process depends upon chlorine abstracting one equivalent of potassium from two molecules of ferrocyanide of potassium, which coalesce to form one molecule of the ferridcyanide of potassium, chloride of potassium being formed at the same time, as follows:—$2(K_2Cy, FeCy) + Cl = K_3Cy, Fe_2Cy_3 + KCl$.

This process is no doubt one of the best, and when the action of the chlorine can be interrupted in time to prevent the decomposition of a portion of the product into chloride of cyanogen and various secondary compounds, which are known to act injuriously by their presence in preventing, to some extent, the subsequent crystallization of the salt. This loss and inconvenience is avoided, according to Professor Reichardt, of Jena,* by substituting bromine for chlorine, which will prevent the occurrence of the decomposition to which the ferridcyanide is liable by the prolonged action of chlorine. Aside from this advantage, the author recommends his process on the ground of greater facility with which the salt is prepared. The reaction is in every way identical with that of chlorine, the product being ferridcyanide of potassium and bromide of potassium:—$2(K_2Cy, FeCy) + Br = K_3Cy, Fe_2Cy_3 + KBr$. In regard to the economy of a process, which calls for the use of bromine,—an article although of late years greatly reduced in value,—few manufacturers could be induced to adopt such an expensive substitute.

The process which I have used for years, and for which I claim results as advantageous as the bromine process, with the additional desideratum of cheapness, is based on the action of chlorine, which is formed and made to act upon the yellow prussiate *in statu nascenti* during the process. Four equivalents of hydrochloric acid and one of bichromate of potash are made to act upon a boiling solution of ferrocyanide of potassium, with the formation of two equivalents of ferridcyanide of potassium, three of chloride of potassium, one of sesquioxide of chromium, one of water and one of chlorine, as exemplified by the following equation:—

$$4(K_2Cy, FeCy) + KO\,2CrO_3 + 4HCl = 2(K_3Cy, Fe_2Cy_3) + 3KCl + Cr_2O_3, 3HO + HO + Cl.$$

Reduced from equivalent to working quantities, the following formula will give satisfactory results:—

Bichromate of potash, 1 part, by weight.
Ferrocyanide of potassium, cryst., 5·72 parts, by weight.
Muriatic acid, spec. grav. 1·16, 3 parts, by weight.
Water, 60 parts, by weight.

Dissolve the two salts in hot water, add the acid, heat to boiling, continuing the ebullition, replacing the water evaporated during the process until a portion of the filtered liquid is not precipitated on the addition of sesquichloride of iron. When reaction is completed filter the liquid, and wash the hydrated sesquioxide of chromium, unite the liquids, and concentrate to crystallization. If the evaporated liquid possess an acid reaction, the addition of caustic potash, in sufficient quantity to cause a weak alkaline reaction, will greatly facilitate the subsequent crystallization. Generally, there is no difficulty experienced by following these processes if the relative proportions are used in the prescribed equivalent amounts. An excess of muriatic acid should be studiously avoided, inasmuch as an excess will contaminate the solution of red prussiate of potash with sesquichloride of chromium, which will communicate an emerald-green colour, and give a green precipitate of hydrated sesquioxide of chromium on the addition of ammonia.—*The Pharmacist.*

CALIFORNIA CASTOR OIL.

The *Marysville Appeal* has the following account of a recent visit to the castor-oil manufactory of Dr. M'Daniel, situated in Marysville:—"Being a novice in the preparation and pressing of the castor-bean, and the process employed to produce the pure oil, we were surprised at the simplicity of the machinery and everything connected with the *modus operandi.* The beans are first subjected to a dry heat of an hour or so in a furnace. This softens them and brings them to that peculiar state required in expeditious pressing. They are then taken out and placed in a screw-press, run by horse-power, and capable of pressing between 80 and 100 gallons of oil per day. From the press the oil is conveyed into a vessel, and from thence into a large iron tank or boiler. In this is placed 60 gallons of oil and the same amount of water, the latter serving to cleanse the oil of all impurities. The oil is then boiled about an hour, and kept standing until the next morning, when the water is drawn off and the oil transferred to the clarifiers, which are composed of zinc, and capable of holding from 60 to 100 gallons each. After standing about eight hours in the sun, it is taken out and put into cans, and is ready for the market. Beans of a superior quality are worth about $90 per ton, and 100 pounds are supposed to produce 5 gallons of oil."—*Druggists' Circular and Chemical Gazette.*

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* Dingler's Polytechn. Journal, Dec. 1869.

The Balsam Bog of the Falkland Islands is one of the most singular and interesting plants of the *Umbelliferæ*. *Azorella Selago*, Hf., has a similar habit, covering the ground in Kerguelen's Land, near the sea, with brown masses many feet in extent, and often so soft that the traveller plunges into or through them up to the middle. Like the *Bolax glebaria*, the living part of the plant forms a crust over a vast amount of débris, the decayed or decaying remains of former years' growth, through which the living roots descend into the ground. It is the most abundant plant in Kerguelen's Land. In Fuegia it is much more scarce, occurring only in small tufts on the mountains.—*Gardeners' Chronicle.*

The Ink Plant.—There is a plant in New Granada which if our inkmakers could only grow in sufficient quantity in this country, would prove a fortune to them. The plant in question (*Coriaria mymifolia*) is commonly known as the ink-plant, and the juice is used without any preparation. According to a tradition in the country, its properties were discovered during the Spanish administration. A number of documents which had been sent to the mother country got wetted by the salt water while the vessel was passing round the Cape; those written with common ink became nearly illegible, while those written with "chanchi," as the juice is called, remained unaltered. A decree was therefore issued that all Government communications should in future be written with the vegetable juice. The ink is of a reddish colour when freshly written, becoming perfectly black after a few hours, and does not corrode a steel pen so readily as ordinary ink.—*Nature.*

Boxwood.—At the present day, when the columns of our newspapers teem with advertisements of various preparations for promoting the growth or changing the colour of the hair, the following account of the results of the use of a preparation of boxwood for that purpose may be of interest. Boxwood, according to the old herbalists, was used from a remote period to render the hair auburn; and we are told by Phillips that a young woman in Lower Silesia, whose hair had fallen off after a severe attack of dysentery, was advised to wash her head with a decoction of boxwood, in order to induce it to grow again. This she did; and "hair of a chestnut colour grew on her head, as she was told it would do; but, having used no precaution to secure her face and neck from the lotion, they became covered with red hair to such a degree that she seemed but little different from an ape or a monkey!"—*Nature.*

Cultivation of Tea in the United States.—The American Commissioner of Agriculture reports that tea culture is fast becoming a feature of importance in the western and southern States, and that in a few years enough tea will be grown in those sections to meet the home consumption. The department has sent out to various parts of the country over 50,000 plants, nearly all of which have lived; and it is now distributing seed which came from plants raised in South Carolina.—*Grocer.*

Another Use for Coal Oil.—Samuel Bryant, of Carrollton, Miss., has discovered that petroleum will make the hair grow. The way that he found out this new property of coal oil was simply this: he had a large boil on the bald place on his head, which gave him much pain, and, in the absence of anything else, he rubbed coal oil on it. He says it relieved the pain almost instantly, so he continued to rub on the oil until the boil was entirely well, when, to his surprise, he found a thin coating of hair coming out over the bald place. He continued the use of the oil for a month or two, and now has a heavy coat of hair on his head.—*Democrat, Ballston Spa, N.Y.*

A Deposit of Alum of considerable magnitude has been discovered in the Kuhu valley in Madras, by shepherds. As a rule, the headmen of villages prefer even now not to disclose mineral discoveries.—*Nature.*

CONVERSAZIONE OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

On Wednesday evening, in response to the invitation of the President and Council of the Pharmaceutical Society, a large company of ladies and gentlemen assembled in the South Kensington Museum. The meeting was a most successful one, and the presence of many ladies, who thronged the various courts or listened to the fine selection of music performed by the band of the Grenadier Guards, under the direction of Mr. Dan Godfrey, gave a picturesqueness and charm to the scene which must have added considerably to the pleasure of those who were privileged to witness it. In the Lecture Room, the Orpheus Glee Union, under the leadership of Mr. W. Fielding, sang a selection of glees and madrigals, and here, again, every corner of the room was crowded.

By the courtesy of the authorities at the South Kensington Museum the south court, with the gallery at the end, was for the first time thrown open, the screen which formerly parted off one end of it having been removed.

The company numbered close upon three thousand, and among the visitors present were Lord Bathurst, Lord de L'Isle and Dudley, Sir Walter Stirling, Sir G. Duncan Gibb, Sir John Bowring, Sir Charles Locock, Sir W. Ferguson, Captain Stacpoole, M.P., Dr. J. A. Lush, M.P., and very many eminent medical and scientific men both of this and other countries.

ANNUAL DINNER OF THE MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The First Annual Dinner of this Association was held on Thursday evening, April 27th, 1871, at the Mitre Hotel; the President in the chair; the vice-chair being occupied by Mr. Allcock.

After a few suitable remarks from the President, and the usual loyal toasts, the following were the toasts of the evening:—

"The Success of the Manchester Chemists' Assistants' Association," by the Vice-Chairman; "The Manchester Chemists and Druggists' Association," by Mr. W. Lane; "The Pharmaceutical Society," by Mr. Yeats; "The health of the retiring Officers and Committee," by Mr. Dickinson.

The special health of the Secretary (Mr. B. H. Cowgill) was then proposed for the very great service he had rendered the Association.

The Secretary briefly responded, and thanked the members for the great mark of respect shown to him; he sincerely hoped that on future sessions every success would attend them.

The remainder of the evening was very agreeably spent with music, singing, etc.

A Disease in the Coffee Plant has lately appeared in the coffee plantations of Ceylon, which may prove a serious one. The Rev. M. J. Berkeley, in a communication to the *Gardeners' Chronicle*, says that he has received specimens forwarded by Mr. Thwaites, in which the albumen of the seed (the portion so universally used) has been developed sufficiently to present the usual convoluted appearance; but the growth seems to have been suddenly arrested. In consequence the substance is not perfectly solidified, so that it contracts and acquires a dark dusky tinge, in some cases becoming black. On examination under the microscope, every seed up to a certain point appears normal, nor is there the slightest trace of fungi. Mr. Thwaites attributes the disease, and as Mr. Berkeley thinks, correctly, to sudden changes in the weather, and it is hoped that it will not extend beyond the present season.

The Pharmaceutical Journal.

SATURDAY, MAY 20, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL MEETING.

Anticipating the full report of the proceedings of Wednesday, we now place before our readers some of the most important points. The chair was occupied by the newly elected President, Mr. Haselden, who commenced his address by referring briefly to his unanticipated appearance in the Presidential chair; and in alluding to the retirement of Mr. Sandford, eulogized that gentleman's uprightness, ability and patience as President. Speaking of the custom which had obtained with his predecessors of noticing the pharmaceutical novelties of the year, he referred to the importance assumed by hydrate of chloral, but said that the results of scientific research were now so freely published that he who runs may read. The early closing question, which had recently been discussed in the Journal, was one of great difficulty; as a rule what would be practicable with one class of business would not be so with another. With regard to the examinations, he thought that the report made by Dr. Greenhow was very gratifying. Opinions had been expressed that the Preliminary Examination was made too stringent, especially in the Latin, but he could scarcely see how the examination could be made lighter, if it were to be an examination at all, for the pharmaceutical Latin required is only such as should be known by every one behind a chemist's counter. He also expressed a hope that when the subject of the poison regulations came before the meeting, they would bestow upon it that quiet and calm consideration the subject deserved.

The adoption of the Council's report and the financial statement was then moved by Mr. Wiggins and seconded by Mr. Carteighe.

In the discussion that followed, several members called attention to the fact pointed out in this Journal last week, that the subscriptions from some of the large towns to the Benevolent Fund were very trifling, while the names of others were absent from the list altogether. Several suggestions were made; one that a circular should be supplied to the local secretaries by means of which they might canvass their districts, and it seemed to be the general opinion that upon these gentlemen much would depend as to the amount of contributions that would be obtained. Mr. Vizer thought that it would be advantageous to add a separate column to the Calendar, showing the subscription or lack of subscription of each of the members, also that a more frequent publication of donations would be advisable.

This gentleman also mooted another subject that has been alluded to in our columns, the imperfect state of the Register and the absence of any provision for securing notification of any change of address.

Mr. Schacht again brought forward the subject of provincial education, and said that while not wishing in any way to check contributions to the Benevolent Fund, he thought that was not a matter of primary importance for the Society in its corporate capacity. He complained that while £500 had been voted towards that Fund from the general funds of the Society, so little money had been spent in the interest of provincial education.

He also pointed out that while the accommodation for students in the London School is only sufficient for a hundred pupils a year, that is not more than a twentieth part of the number who have to be educated; and, in reference to the complaints that more do not pass the examinations, he declared his opinion that the opportunities for acquiring pharmaceutical knowledge are virtually no greater than they were thirty years ago.

After these and some other remarks which—though relating to matters of deep interest to the Society—took only a subordinate part on this occasion, the resolution was put to the meeting and carried.

The most important feature of the day's business was then introduced by the President, who said, that in reference to the Poison Regulations, he should merely read a letter that had been received from Mr. Simon, and then move the resolution, "That this meeting having considered the recommendations prepared by the Council, desires the Council to propose them for voluntary adoption, but does not desire and does not prescribe them as or to become regulations within the meaning of the Pharmacy Act, 1868."

This resolution was seconded by Mr. I. Bourdas.

An amendment was proposed by Mr. Giles to the effect that, by virtue of the power granted by the Pharmacy Act of 1868, the Pharmaceutical Society of Great Britain prescribed the regulations, and resolved that they be submitted to her Majesty's Privy Council for their consent. He remarked that the occasions were few when a Society should differ with the recommendations of its executive, but the present was one. The Council had yielded, he thought wrongly, their own judgments to an expression of opinion which was informal. He said that the Society was bound to prescribe regulations in accordance with the pledges made in its behalf on the passing of the Pharmacy Act, 1868, and he proceeded to read various extracts from that Act, from leading articles in the Pharmaceutical Journal, and from the debates in the Houses of Paliament,—particularly from the speeches of Mr. Lowe, Mr. Bruce, Lord Granville and Lord Redesdale,—to show that the obligation was generally known and recognized at that time. The consequence of a repudiation of the contract by the Society would be injurious to its influence, and would inevitably lead to inspection by causing the Privy Council to seek further legislation.

Mr. Giles's amendment was seconded by Mr. Baldock, and a long discussion took place, the result of which was, that on division 85 votes were given for the amendment and 104 against it. The resolution moved by the President was then put and carried.

In the course of the discussion which followed Mr. Giles's amendment, some of the speakers took occasion to point out that it had been suggested the meeting was not competent to dispose of the question as to Poison Regulations, because many who were opposed to the compulsory application of those regulations were not present. It is satisfactory to find that this fallacy was not lost sight of, for if it were to be seriously entertained, the performance of the Society's functions might be indefinitely suspended. If the Annual Meeting of the Society be not a representative of the Society in its corporate capacity, it ought to be so; it is the absentees who are in fact responsible and to blame for any unfitness in the acts of the corporate body, or for any disregard of the opinions held by them, and there can scarcely be any more emphatic condemnation of those opinions than absence from the general meetings.

Quite on a par with this idea is the outcry raised against the action of the Society by those who do not belong to it,—who, in the spirit of Uriah Heep, rejoice in calling themselves "outsiders." Several of those who took part in the discussion on Wednesday, expressed opinions quite in accord with our recent remarks on this point; and though Mr. Urwick pleaded the existence of a bar as an excuse for not entering the Society, we were glad to see indications of the opinion that every one practising the art of Pharmacy should be a member of the Society. We fully believe with Mr. Humpage that the more "outsiders" are brought in contact with the Society, the more readily will their prejudices be dispelled, and the more powerfully will the pharmacists of Great Britain be in the position to substitute for mere clamour, a public opinion entitled to respect and able to command it.

At the moment of going to press, we learn that the voting for Members of Council has resulted in the election of Messrs. Atherton, Betty, Brown, Carr, Frazer, Greenish, Haselden, Hills, Mackay, Sandford, Shaw, Smith, Williams and Woolley.

It was announced by the President of the Royal Academy, at the recent annual banquet of that body, that it had been decided to establish a Professorship of Chemistry in connection with the Academy. The object of its institution is to promote the study of the properties of colours, varnishes, etc., so as to ensure as far as possible purity, and, above all, permanency of colour. In the recent exhibition of the ancient masters the fact has been apparent that while many of the old pictures—some of them three or four hundred years old—still retain their original brilliancy and purity of colour, some of those painted within the last fifty years by painters of European renown, have greatly deteriorated. The professor will be required to deliver practical lectures on the properties of colours, which will be open to the students and members, as well as artists generally, who may wish to be present. He will also be expected to give information respecting oil painting and mural decoration to any artist seeking it. In connection with this chair it is intended, as soon as the Government buildings are completed, to erect a laboratory for carrying out experiments with regard to colours.

The following papers, which are copies of the agreements entered into with pharmacists by assistants and apprentices in Hamburg, may be interesting to some of our readers as supplementary to the articles which have recently appeared in this Journal on the practice of pharmacy on the Continent. They may also assist in affording an idea of the relations existing there between assistants and apprentices and their principals.

The documents are signed by the Pharmaceutical Members of the Sanitary Council, and every pharmacist there is obliged to have his assistants or apprentices registered within a month of their engagement.

Obligation of a Pharmaceutical Assistant.

"I, ——, after having been engaged at Mr. ——'s business, promise, upon my honour and conscience, to show due respect and obedience to the Hon. Sanitary Council, especially to their medical and pharmaceutical members, also to my principal as my superior, to dispense all prescriptions without delay, by day or by night, with due attention and care, without the least alteration, not to take one article for another, nor to permit the apprentices to do so; to prepare all chemical or other compounds, according to the legal Codex Medicamentarius, to keep everything properly and clean, to sell drastics, opiates, or poisons only with the knowledge of my principal, or, in his absence, as far as the laws permit me, and, with due precaution, to follow strictly in dispensing the legal tariff, and in retail sales the instruction of my principal; not to allow strangers to read the books in which the prescriptions are entered, to be polite and modest towards everybody, to abstain from all prescribing, not to receive any visitors during business hours, to fulfil all my duties diligently and faithfully, and to act in every respect as an honourable and upright pharmaceutical assistant."

Obligation of a Pharmaceutical Apprentice.

"I, ——, apprentice in Mr. ——'s business, do hereby promise most faithfully to endeavour, to the best of my abilities, honestly and conscientiously to fulfil the obligations I have entered into as a pharmaceutical apprentice, willingly and cheerfully to obey my principal or other superiors, to execute any work intrusted to me with care and cleanliness, in doubtful cases never to follow my own opinion, but always to ask the advice of my principal or of the assistants placed over me; without their permission never to sell emetics or purgatives, drastic or poisonous substances; to behave towards the public with politeness and modesty, not to receive any visitors during business hours, nor to occupy my time with extraneous matters, diligently and carefully to apply the time allowed to me for my own instruction, and thankfully to receive any information; above all to endeavour practically to apply any knowledge acquired, to avoid or to despise no practical work however trifling, and not, as is frequently the case, to any but practical work in favour of scientific study; finally, at all times to behave as may be expected from an honourable and upright pharmaceutical apprentice."

These obligations may appear one-sided, all in favour of the principal, but it must be stated that he has his duties as well; the Sanitary Council has arranged weekly lectures on chemistry, botany, etc. which the assistants are desired, but the apprentices obliged to attend; in like manner weekly botanical excursions are arranged, under the guidance of an experienced botanist, which makes it easy, almost natural for assistants and apprentices to collect their own herbaria, and these scientific instructions are paid for by the Principal as a member of the local Pharmaceutical Society.

According to an estimate in the *Grocer*, the imports of beetroot-sugar in the Clyde during the seven months from September 1, 1870, to March 31, 1871, amounted to nearly 36,000 tons.

The *British Medical Journal* is enabled, from information derived through private and trustworthy sources, to state that Ceylon gives fair promise to take rank at no very distant time as one of the chief quinine-producing countries. Until recently it was thought that the bark of the cinchona plant, as cultivated in that colony, did not yield an appreciable quantity of quinine, but only cinchonine or other of the less valuable medicinal alkaloids; consequently little attention was bestowed on its cultivation. But in a recent analysis of some barks sent to this country, 289 grains of sulphate of quinine, 47 grains of quinidine, and 14 grains of alkaline cinchonine were found in one pound of bark. Thus an ounce of sulphate of quinine was obtained from one pound eight ounces and a quarter. As the supply from Peru has greatly diminished, and as India, it is said, consumes its own quinine, there is reason to believe that the cultivation of cinchona will secure some of the attention of cultivators in Ceylon which has hitherto been almost exclusively devoted to the growth of the coffee plant. As another cause which may give an impetus to the cultivation of cinchona in Ceylon, it is stated that the red bark is highly praised in Paris for tooth-powders, as it gives them a delicate tinge, and, at the same time, a bitter flavour.

A milk-yielding tree, native of the valley of the Amazon, and known as the Maçaranduba or Massaranduba, has lately been introduced to notice in Europe. It is a large tree, and appears to be a species of *Mimusops*, belonging to the Natural Order *Sapotaceæ*. It is abundant in the Amazon valley, in the province of Rio de Janeiro, Pará, Minas Geraes, etc. The wood is hard, as is the case with most of the *Sapotaceæ*, and is used both for ship and house building. The milk is quite white, and flows from the trunk freely upon incisions being made, but hardens on exposure to the air, when it has similar elastic properties to gutta percha and balata. When fresh it is used both medicinally and as an alimentary article, but never in its pure state, being either mixed with a small quantity of water, or used as we use ordinary milk, with coffee or tea.

A prize of £10 and another of £3 are offered by the Royal Horticultural Society for the best two collections of British insects injurious to any one plant, the choice of the plant being left to the collector. The insects are to be shown as much as possible in their various stages of development, and a preference will be given to those collections which most successfully illustrate the life-history of the insect, and exhibit the mischief done, whether by specimens, drawings, models, or other means, examples of which may be seen in the Society's collection in the South Kensington Museum. Two other prizes of £5 and £2 are offered for the best miscellaneous collection illustrating similarly any branch of British economic entomology. The collections are to be sent to Mr. J. Richards, Assistant-Secretary of the Society, on or before the 1st of May, 1872, each collection bearing a motto, and accompanied by a separate sealed envelope with the motto on the outside, and the name of the competitor within.

We regret to say that Mr. Ferdinand Kohn, of whose paper on "The Different Methods of Extracting Sugar from Beetroot and Cane," recently read before the Society of Arts, we this week give an abstract, died, after a few days' illness, on the 2nd inst.

We learn from the *Athenæum* that an Italian Chemical Society has been established, under the auspices of Dr. Canizzaro. The Society will publish a journal under the joint editorship of MM. Schiff, Tassinari, Korner, Paterno and Gabbas.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

May 12th, 1871.

Present—Messrs. Allchin, Bird, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Garle, Haselden and Ince.

MODIFIED EXAMINATION.

Forty-seven Candidates were examined; the following twenty-seven passed, and were declared to be qualified to be registered as

CHEMISTS AND DRUGGISTS.

Archer, James .... Lechlade.
Bowen, Joseph William ...... Holyhead.
Burnham, Henry .... Preston, Yorkshire.
Coates, Henry .... York.
Coates, Richard .... Croydon.
Crackle, William Henry...... Nottingham.
Elliott, William .... Wandsworth.
Fogg, Robert .... Bolton.
Gilliatt, William .... London.
Gray, James Thomas .... Padiham.
Green, John .... New Cross.
Gunn, Daniel .... Paddington.
Hardcastle, William, jun. .... Darlington.
Kay, John Broomhead ...... London.
Oakley, Robert Henry ...... Birkenhead.
Plumb, James Edwin .... Surbiton.
Raw, James Harrison .... Beverley.
Saunders, John .... London.
Spratt, George Uriah .... Boston.
Spyer, Newton .... Watlington.
Steeper, Samuel .... Roughton.
Thomas, Joseph Josiah ...... Ryde.
Wade, Thomas Taylor ...... Cotham, Bristol.
Wakefield, Thomas .... Birmingham.
Willan, James Henry Burton . London.
Williams, James .... London.
Woodcock, Arthur .... London.

The Certificates presented by the undermentioned were received in lieu of the First or Preliminary Examination:—

Bird, Lewis John .... Northampton.
Vidler, William Thomas...... Hendon.

The above should be read as part of the proceedings of the Board of Examiners at the meeting held on April 19th, 1871, see p. 851.

Provincial Transactions.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Annual General Meeting was held on April 3rd, in the Society's Rooms, Fawcett Street; Alderman THOMPSON, President, in the chair.

The Report and Balance Sheet for the past year were read by the SECRETARY, and adopted by the meeting.

"In presenting the Second Annual Report to the Members and Associates, the Council is happy to be able to state that the Society progresses favourably, and during the past year has amply justified the hopes that were entertained of its usefulness and success.

"During the session the rooms at 60, Fawcett Street, have been open nightly for purposes of study, provided with books, contributed by several members, scientific periodicals, the property of the Society, and the materia medica, cabinet, and text-books, presented by Messrs. Evans and Co.

"Lectures have also been delivered by the following gentlemen:—In October, 1870, by Mr. Nicholson, on 'The Progress made in Practical Chemistry during the past year.' In November, by Mr. Sharp, on 'Sulphur, its History, Sources and Properties.' In December, by Mr. Cockburn, on 'Cinchonas and their Alkaloids.' In February, 1871, by Mr. J. Harrison, on 'Heat and its Applications.'

"Various subjects connected with the business have been brought forward for discussion, and the decision of the Society acted on; among others, a petition was sent up to the Council of the Pharmaceutical Society, at the last Annual Meeting, against the Poisons Regulations.

"The Society has also, by a large majority, passed a resolution in favour of steps being taken to extend the exemption from service on juries, now enjoyed by Pharmaceutical Chemists only, to all registered chemists and druggists.

"At the end of this, the second year, the members of the Council venture to hope that the members will give them credit for having done all in their power to promote the welfare of the trade, and that they will bestow the same amount of encouragement and support on their successors as they have upon them."

The Balance Sheet showed an expenditure of £18. 16*s*. 9*d*. and a balance of 2*s*. 9*d*. in the Treasurer's hands.

The following officers were elected for the ensuing year:—W. Thompson, Esq., President; Mr. H. Thompson, Vice-President; Mr. Robinson, Treasurer, and Mr. Nicholson, Secretary. Council:—Messrs. Harrison, Nasbet, Sharpe, Thompson, Lord, Bird, Ritson, Cockburn and Burn.

It was resolved that the Monthly Meetings be held on the first Tuesday in the month, instead of the Monday, as formerly.

That the annual subscription be reduced to 5*s*. for members, and 2*s*. 6*d*. for associates.

That this meeting, "considering that all Chemists and Druggists now require registration, and that they discharge the same duties and incur the same responsibilities as Pharmaceutical Chemists," is of opinion that the exemption from service on juries, now enjoyed by Pharmaceutical Chemists only, ought to be extended to every registered Chemist and Druggist.

That the Council of the Pharmaceutical Society be requested to take steps to secure this object.

Votes of thanks were then passed to the officers and lecturers for the past year.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The First Annual Meeting of this Association was held on Thursday evening, April 20th, 1871, in the Council Room, Mitre Chambers; the President, Mr. W. METCALFE, in the chair.

On rising he reviewed at some length the benefits to be derived from such an Association as their own. He felt happy that they had been so successful during this their first session, as the report which he would call upon the Secretary to read would show; besides the Society being a source of mutual improvement, it had also been a means of creating a more friendly feeling amongst the Assistants and Apprentices of Manchester than had hitherto existed; he then called upon the Secretary to read the report as follows:—

"The Committee, on presenting this their first Annual Report, are happy to be able to congratulate you upon the great success attained by this Association during its first session; since its commencement on November 3rd of last year, 1870, the following papers have been read:—'Water,' by Mr. Miles Atkinson; 'The Alkaloids Morphia, Strychnia and Quinine,' by Mr. Raworth; 'Mercury and its Preparations,' by Mr. J. Hodson; 'Iron and its Preparations,' by Mr. W. Metcalfe; 'Adulteration of Drugs,' by Mr. Nicholson; 'The Examinations of the Pharmaceutical Society and Pharmaceutical Titles,' by Mr. Gill; 'The Materia Medica of the Pharmacopœia,' by Mr. Clark; 'Opium,' by Mr. Lane; 'Metrical System of Weights and Measures,' by Mr. Spencer; 'Medicinal Uses of Vegetables and their Preparations,' by Mr. Binns; 'Vegetable Tissue,' by Mr. Yeats; 'The Proposed Poison Regulations,' by Mr. B. H. Cowgill; 'Concentrated Infusions,' by Mr. Mercer.

"Besides the above, on four occasions, Mr. Clark has examined and explained the nature, etc. of the specimens contained in the cabinets of the Chemists and Druggists' Association. There have also been some very interesting discussions upon 'The Dispensing of Prescriptions,' and the various modes of prescribing adopted by the medical profession.

"On referring to the poison regulations question, we are of opinion that the course to be pursued as decided at the meeting of the Pharmaceutical Council on April 5th, will meet with your entire approval.

"The memorial signed by the members of this Association and other assistants, numbering in all 97, against the passing of any compulsory regulations for the keeping and dispensing of 'poisons,' was presented at the above meeting of the Pharmaceutical Council by Mr. W. S. Brown.

"We are happy to state that in a pecuniary sense our affairs are satisfactory, there being a balance in the hands of the Treasurer of 15*s.* 10*d.*

"On retiring from our office, we unanimously express a wish that this Association may prosper. We are sure that in many ways it has been, and will continue to be most advantageous in point of usefulness, instruction and intercourse."

The report being confirmed, the election of officers and committee for the ensuing year then took place (by ballot), when the following were elected:—

President, Mr. W. Lane; Vice-President, Mr. Allcock; Secretary, Mr. Clark; Treasurer, Mr. Dickinson; Committee, Mr. Cooper, Mr. Harrison, Mr. Headley, Mr. Mercer, Mr. Nicholson, Mr. Tyson.

After a vote of thanks to the retiring officers and committee, the meeting terminated.

DUNDEE CHEMISTS AND DRUGGISTS' ASSOCIATION.

A Meeting of the above Association was held in their room, 71, High Street, on Tuesday evening, May 2nd; Mr. W. Laird, President, in the chair.

The Secretary, Mr. James Russell, presented a collection of drugs from Messrs. Hodgkinson, Stead and Treacher; and also, in the name of Messrs. Evans, Sons and Co., wholesale druggists, Liverpool, one of their cabinets of materia medica, containing upwards of 300 specimens of drugs and chemicals, with descriptive tables.

The President, in accepting the gift, expressed a hope that the Association—particularly the junior members, for whose benefit the gift was especially intended—would largely avail themselves of the advantage that so complete a collection of the articles used in their profession placed within their reach, and moved that a special vote of thanks be sent to the firms, and acknowledgment made in the local and trade journals.

Mr. Jack seconded, and Mr. Doig and others supported the motion, which was carried.

Mr. F. Young presented a copy of 'Barber's Medical Botanical Chart of the World,' the gift of Mr. Charles Kerr, and suggested that the assistants should combine and form a class for the study of materia medica, to which end the chart would be a useful companion to the cabinet, and said that from his own experience of the benefits derived from his attendance at the class for chemistry, conducted by the President during the past two sessions, the time would be well spent.

A collection of crystals, the gift of Mr. Laird, was also exhibited during the evening.

Mr. Ross proposed a vote of thanks to the Chairman, which was cordially carried.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

The Extraction of Sugar from Beetroot and Cane.

At the Meeting of the Society of Arts on the 15th March, Mr. Ferdinand Kohn, C.E., read a paper on the "Different Methods of Extracting Sugar from Beetroot and Cane," of which the following is an abstract:—

The two plants at present principally used in the manufacture of sugar are beetroot and cane. The sugar in both these plants exists dissolved in the juice which is held within the vegetable cells; but the character and composition of the solutions are different in the two kinds of juice. Beetroot juice contains from 7 to 15 per cent. of sugar, a considerable proportion of insoluble and soluble albumen and a quantity of salts, which generally give to it an alkaline character. The cane juice contains insoluble nitrogenous matter, soluble albumen and certain salts; but its reaction is always acid, and its contamination with salts is less in proportion than that of the beetroot. The percentage of sugar in cane juice ranges widely, but may be taken as averaging from 15 to 20 per cent. in that from ripe cane. Cane juice generally contains also a sensible proportion of glucose, different in composition from cane sugar, and incapable of being crystallized in the ordinary processes of sugar manufacture; but beetroot contains only a small percentage of it. The beetroot contains about 96 per cent. of juice and only 4 per cent. of a solid insoluble substance which forms the pulp. The sugar-cane is composed of 90 per cent. of juice, the remaining 10 per cent. being wood-fibre, in the shape of cane-trash or bagasse. The sugar is extracted from these plants by separating the saccharine solution from the surrounding solid masses.

The traditional and most primitive method of extracting the juice from beetroot and cane is by mechanical pressure. By the compression of the raw material the cellular structure of the tissues is destroyed, and the liquid contents of the individual cells forced out from the solid residue. Juice so expressed is consequently charged with the impurities originally contained in the plant, and intermixed with minute fragments of the fibrous solid mass that have been disintegrated by the action of the mechanical force. The beetroot before being exposed to this process of extraction requires to be reduced to a fine pulp by means of a so-called "pulper," or rasp. It generally consists of a double revolving drum fitted with toothed saw blades or scrapers, which being rapidly rotated, effects the disintegration of the roots and converts the mass into a fine soft pulp. The pulp is then placed into woollen bags and subjected to pressure in a powerful hydraulic press, by which process the juice is forced through the meshes of the bags and the solid residue formed into a dry dense cake. In consequence of the imperfect breaking up of the vegetable cells by the action of the rasp, a quantity averaging about 14 per cent. of the juice remains in the residue, which is not sensibly affected by increase or longer duration of the pressure. About another five per cent. of juice, however, may be obtained by the expedient of mixing the water with the pulp in the process of rasping; the water, by the action of endosmosis and exosmosis, effecting a partial extraction of the sugar contained in the unbroken cells.

The extraction of sugar from the cane by the application of pressure in the ordinary roller-mill, is a method defective in several important points, which were well set out by Mr. Henry Bessemer in the specification for a patent of a hydraulic press invented by him twenty years ago. In order to extract the juice by its means the rollers must be set sufficiently close to give a very tight pinch, but not close enough to break up the cane-trash, which would be thereby lessened in value as fuel, or to force out certain other matters with the juice which are prejudicial to it. This uniformity of pressure, in consequence of the variability in the size of the canes and the knots and rind being harder than the other parts, is practically impossible under the present method, and thus a quantity of green wax, chlorophyll and other objectionable matters is expressed from the knots and the rind which should have escaped pressure altogether. The presence of the fragments of cane and of the small pieces of cellular tissue in the juice greatly increases its tendency to fermentation and impedes the process of defecation. Notwithstanding many improvements introduced into the construction of modern sugar mills, the amount of juice obtained by the best of them only averages about 70 per cent. of the weight of the cane. As the theoretical quantity of juice in the cane is 90 per cent., there is about 20 per cent. of juice still left in the cane after undergoing the process of crushing.

If the results of pressure, as applied to beetroot and to cane be considered, the proportion of unexpressed juice in the beetroot, amounting to 9 per cent., compares favourably with the 20 per cent. left in the cane. But the placing of the beetroot pulp into bags, and the proper building up of the piles of bags in the hydraulic press, are operations which take up much time and require considerable skill to perform well. The expense of washing and mending the bags also forms a serious item in the cost. To obviate these disadvantages several methods have been invented.

The first of these in chronological order was designed by M. Schutzenbach for the extraction of the juice by the means of centrifugal force. The beetroot pulp is placed in a cylindrical sieve or perforated drum, which is made to revolve on a vertical spindle at the rate of 1000 or 1200 revolutions a minute, and is enclosed in an outer cylindrical casing. The action of centrifugal force, corresponding to the velocity of the rotation, effects a rapid displacement of the juice, while the solid portion of the pulp is retained in the cylinder. A quantity of water, amounting to about 30 or 40 per cent. of the weight of the pulp, is injected into the turbine, in finely-divided streams, during the operation, for the purpose of assisting the displacement of the juice. By this method, under careful management and supervision, the yield of juice from the beet has reached 88 per cent., while, as compared with the hydraulic press system, the manual labour is greatly reduced, and the expense of the pulp bags is avoided altogether. The centrifugal system has, however, not gained ground on the Continent, principally from its success depending too much upon the skill and care in the working of the turbine; the slightest variation in the quality or quantity of the pulp with which it is charged requiring a scientific readjustment of the quantity of water injected and of the speed of the revolutions.

Another method, invented by the same gentleman, consisted in the pulp undergoing a process of maceration. This was effected by causing water to pass successively through a series of ten or twelve tanks charged with pulp, which were placed so that the juice might drain off from one tank into the next until the last was reached. The process is very economical in the amount of labour required, and is capable of a good yield under careful management.

But this invention is superseded by that of Herr Julius Robert, of Seelowitz, in Austria, one of the most eminent beetroot sugar manufacturers on the Continent, which is a process of diffusion, dispensing entirely with the application of direct mechanical force, and based upon Graham's celebrated discovery of the osmotic properties of organic cells. By it the saccharine matter is extracted from the closed cells without bursting them open. The name of diffusion was given by Graham to a process which takes place when two liquids containing different bodies in solution are separated only by an organic membrane; the liquids mutually exchange their soluble matters and gradually equalize their degree of concentration. There is, however, a great difference in the speed with which this exchange and equalization take place; crystallizable bodies, such as sugar and salts, passing through the organic partition at a quicker rate than non-crystallizable, such as albumen and other nitrogenous compounds. By this property, therefore, the unbroken cells of beetroot or cane immersed in water or weak saccharine solutions are capable of yielding part of their sugar and salts to the surrounding liquid. A slice of beetroot or sugar cane, containing 10 per cent. of sugar in its juice, immersed in an equal weight of water, will gradually part with its saccharine contents until the juice in the cells and the water outside each contain 5 per cent. of sugar. If a fresh slice, containing 10 per cent., be placed in this 5 per cent. solution of sugar, the resulting equalization will produce a solution of $7\frac{1}{2}$ per cent. On the other hand, the partially-exhausted slice, containing 5 per cent. of sugar, will part with $2\frac{1}{2}$ per cent. of it to a fresh supply of water. Thus, by a series of operations, bringing the pure water into contact first with nearly exhausted slices, and then passing the weak saccharine solutions over slices which have parted with a smaller proportion of their sugar, the solution produced may be brought very nearly to the density of the natural juice of the plant; while the slices coming in contact successively with weaker and weaker saccharine solutions, and finally with pure water, give up nearly all their sugar and become completely exhausted. Another advantage resulting from this process is, that in consequence of the difference of speed between the diffusion of sugar and that of the nitrogenous compounds in a given time, which, if sufficient for the proper proportion of sugar and soluble salts to pass into the surrounding liquid, only a small portion of the nitrogenous compounds will be given up; while the insoluble impurities are prevented entirely from leaving the cells of the plant and passing into the diffusion juice. Thus the juice produced by the diffusion process is always purer and less liable to spontaneous decomposition or fermentation than that expressed by mechanical force. This process has been applied to beetroot and to sugar-cane with an equally complete and decided success.

In practically carrying out this system, the beetroots are first washed, and then cut by machinery into slices of about $\frac{1}{4}$ in. or $\frac{3}{8}$ in. in width and thickness, and of a length according to the size of the roots. They are then ready for placing in the diffusion battery. This consists of nine or ten cylindrical vessels, containing slices in different stages of exhaustion and juice of different degrees of density. As each portion of the operation is completed, the solution is conveyed to the vessel containing the slices with the next highest proportion of sugar. Thus in each vessel in turn the slices having the least sugar are brought into contact with fresh water, and are discharged from it with only about $\frac{1}{2}$ per cent. of sugar; while at the other end of the process the rich solution which has passed successively through the other vessels is passed into that containing the fresh slices, and is discharged thence into the clarifying-pan. The exhausted slices are equally valuable as a food for cattle with the pulp from the hydraulic press, but they hold a large surplus of water, which is a drawback when it is necessary to convey them from one place to another. This has been to some extent obviated by submitting them to the action of a hydraulic press, which removes the water without to any great extent expelling the elements of food.

With the sugar-cane the process is very similar, and it has been successfully carried out by a company in Madras. The juice so procured is very pure; it has a bright yellow colour, and gives off but little scum in the clarifier. When the cane is perfectly ripe and in good condition, the diffusion juice requires no filtration through animal charcoal, and may be passed at once into the evaporators and vacuum pans, producing good high-class raw sugar. The diffusion juice, however, contains an excess of about 20 per cent. of water, the cost of evaporating which has to be taken into account. To balance this on the other side, the yield of juice by diffusion (when reduced to the natural density of the juice of the cane) is about 82 per cent. against 70 per cent. obtained by the mill. Moreover, in consequence of its greater purity, a larger proportion of crystallizable sugar is obtained from it, amounting in some cases to 43 per cent. The capital and labour required for the two methods are about the same.

Herr Robert has recently invented a modification of his process by which it is carried on in one vessel. The fresh slices are introduced at the bottom of a single vessel, and gradually carried upwards, the solution as it becomes of greater specific gravity, in consequence of its increased richness in sugar, descending to the bottom, and being drawn off as concentrated juice.

The above processes for sugar extraction are equally applicable for the production of spirits, since the saccharine juice so obtained is easily fermented and rendered fit for distilling.

CHEMICAL SOCIETY.

May 4th.—Dr. Warren de la Rue, F.R.S., Vice-President, in the chair. The following gentlemen were elected Fellows:—R. S. Best, C. S. Cross, W. H. Darling, G. H. Ogston, J. Schweitzer, W. A. Smith. Dr. Völcker delivered a lecture "On the Productive Powers of Soils in Relation to the Loss of Plant Food by Drainage."

The lecturer began by showing the futility of the belief that a soil analysis could reveal whether a land was productive or not. To those who only imperfectly know the teachings of modern agricultural science, it appears very simple to remedy a deficient soil by finding out, through analysis, the wanting constituents, and then to supply them. But this is not so. Not only is it difficult exactly to analyse a soil, but many other conditions besides the composition of a land have to be observed. The state of combination in which the mineral constituents of a land are found, the physical condition of the soil, the presence or absence of some matter injurious to the growth of plants,—all these are as many important points upon which soil analysis throws no light whatever. The lecturer equally opposes the views of those who advocate that in a system of national farming there should be kept up a debtor and creditor account as regards the constituents which are removed from the soil in the crop grown upon it, and the quantity of fertilizing matter restored to it in the shape of manure. The fertility of the soil cannot be maintained, much less increased, if only as much fertilizing constituents were applied to the land as were removed from it in the crops.

Dr. Völcker then discussed the relative values of various mineral salts as manures, quoting in support of his views the results of the classical field experiments of Lawes and Gilbert, and this then led the lecturer to speak of the examination of land-drainage waters. Lawes and Gilbert throughout a long series of experiments on the growth of wheat have experienced a great loss of nitrogen. The amount of nitrogen supplied in the manures was greater than that recovered in the increased produce. It appeared to Dr. Völcker that the nitrogen lost might have passed into the drains. Careful collection of such drainage waters and their analysis proved Dr. Völcker's supposition to be correct. It became clear that in whatever form the nitrogen is applied to the soil, a large proportion of it is carried off chiefly in the form of nitrates.

At all times of the year, but especially during the active period of growth of the crops, nitrates are found in the watery liquid which circulates in the land, whereas ammonia salts are never met in any appreciably large quantities. It may, therefore, be assumed that it is chiefly, if not solely, from the nitrates that the crops build up their nitrogenous organic constituents.

Dr. Völcker's analyses of drainage waters further showed that potash and phosphoric acid, which certainly are the most important mineral constituents for the plant, are almost entirely retained in the soil, whilst the less important, as lime or magnesia or sulphuric acid, pass with greater readiness out of the land.

MEETINGS FOR THE ENSUING WEEK.

Monday May 22. ......*Royal Geographical Society*, at 1 p.m. Anniversary.
Tuesday May 23. ......*Royal Institution*, at 3 p.m.—"Animal Mechanics." By the Rev. Professor Houghton.
Royal Medical and Chirurgical Society, at 8.30 p.m.
Wednesday...*Linnean Society*, at 3 p.m. Annual Meeting.
Thursday May 25. ......*Royal Institution*, at 3 p.m.—"On Sound." By Professor Tyndall.
Royal Society, at 8.30 p.m.
Friday May 26. ....*Royal Institution*, at 8 p.m.
Quekett Club, at 8 p.m.
Saturday ......*Royal Botanic Society*, at 3.45 p.m.

VACANCIES AND APTPOINMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. Frederick John Barrett, Pharmaceutical Chemist (late student in the School of Pharmacy), as Dispenser to the South Staffordshire General Hospital, Wolverhampton, in the place of Mr. T. Weaver, resigned.

Parliamentary and Law Proceedings.

Death from Overdose of Chloral Hydrate.

The death of Dr. Bruce, resident surgeon in the Dundee Infirmary, consequent upon an overdose of chloral hydrate, is reported. It appears that Dr. Bruce was suffering much pain from a swollen finger, arising, he thought, from an accidental puncture during a dissection. As the swelling increased, he resorted to doses of chloral hydrate to deaden the pain, and on Monday, the 8th instant, he seems to have taken an extra quantity. He was seen by his colleague, Mr. Moon, to whom he complained of the continued swelling and pain. That gentleman desired an attendant to apply a poultice, and proceeded round the wards. Upon his return, he found Dr. Bruce dead. The deceased gentleman was twenty-seven years of age. He graduated last year, and had held the post in the infirmary but three weeks.

Poisoning by Carbolic Acid.

Dr. Gerrard reports in the *Lancet* a case from Jamaica, in which a sailor was poisoned by carbolic acid. It appeared that the captain kept in a cupboard in his cabin two bottles similar in appearance, but one of them containing rum and the other carbolic acid. It is supposed that the deceased, searching for the rum, drank from the carbolic acid bottle instead, as it was found halfway out of the cupboard, but with the cork in it. When discovered, he was comatose, with contracted pupils and intermittent pulse, stertorous breathing and frothing at the mouth. There was also a peculiar livid appearance about the eyelids, lips and ears. The odour of carbolic acid was present. Medical aid was obtained, but death followed within three-quarters of an hour of the supposed time of his taking the poison. It was said that the deceased, whilst searching for liquor on a previous voyage, had swallowed some lamp-oil in mistake for rum.

A Large Dose of Chloral Hydrate.

As illustrating the variable effects of this drug, a correspondent of the *Lancet* mentions a case where a patient saved up five draughts, each containing twenty-five grains of chloral hydrate, for the purpose of committing suicide. He found her just woke from a very deep sleep in an excited state, crying and complaining of great pain at the heart. Knowing that she was addicted to drink, and being told that she had taken more than half a bottle of brandy besides other liquor, he attributed her state to that cause. Afterwards, however, she confessed to having taken the five draughts, making a dose of 125 grains. The next morning, with the exception of being unable to sleep or take food, and the pulse being irregular, she seemed as usual.

Obituary.

SIR JOHN FREDERICK WILLIAM HERSCHEL, BART.

On Thursday, the 11th instant, a man whose name has been for the greater portion of the present century honourably associated with those of the pioneers of science, passed away. The announcement of the death on that day of Sir John Frederick William Herschel, Bart., chronicles the last stage of a long life spent in active scientific investigation, which resulted in discoveries that have added considerably to the stores of human knowledge.

John Herschel was born in 1792 at Slough, where his father, Sir William Herschel, had just previously completed the erection of his forty-foot telescope, at that time looked upon as one of the marvels of the day. Being the only child in the house, and continually surrounded by the appliances for astronomical study, it is not surprising that he early displayed a love for natural philosophy; the inherent mathematical powers of his mind being developed under the most favourable circumstances.

His early education he received from a private tutor. At Cambridge, where he entered St. John's College, he was senior wrangler and Smith's prizeman in 1813. The same year he published his first work, 'A Collection of Examples of the Application of the Calculus to Finite Differences.' His father's great discovery of the motion of the binary stars seems to have produced a powerful impression on his mind, and in 1816 he commenced to examine and catalogue the nebulæ and clusters of stars. This work was continued by him—part of the time in conjunction with the late Sir James South—until 1830, the results being recorded in the Philosophical Transactions and the Memoirs of the Astronomical Society; the importance of the services being recognized by the award to him of the astronomical prize of the French Academy of Sciences and the gold medal of the Astronomical Society. In 1822 he published a treatise on the absorption of light by coloured media; another, on Sound, was also supplied by him to the 'Encyclopædia Metropolitana.' In 1830 his Preliminary Discourse on the Study of Natural Philosophy appeared in 'Lardner's Cabinet Cyclopædia,' and caused a considerable amount of discussion. Although it has not taken the rank which its admirers at first claimed for it, it gives abundant proofs of the writer's eloquence and learning.

Being dissatisfied with the small amount of time during which our changeable climate allowed of the use of the telescope, and being desirous of making a survey of the southern heavens, he, in November, 1833, left England for the Cape, and fixed his residence in the neighbourhood of Table Bay. There he set up his instruments, and for four years devoted his energies to the work he had proposed for himself. At the end of that time he returned to England. The scientific world had watched with great interest his proceedings in connection with this visit to the Cape, and upon his return the public approbation was manifested in the liveliest manner. He was entertained at a great public dinner in London, and the Government of the day offered to reimburse him all the expenses of the expedition, a proposition that he disinterestedly declined. He had previously received from King William IV. the Guelphic order of Knighthood, and on the occasion of the coronation of Queen Victoria he was made a baronet. The presidency of the Royal Society having become vacant by the resignation of the Duke of Sussex, it was proposed to elect Herschel to the honourable office, and, but for his declining to stand, he would probably have been chosen. In 1842 he was elected Lord Rector of Marischal College, Aberdeen, and in 1848 he became president of the Royal Astronomical Society. In 1850 he was appointed to the Mastership of the Mint, a post which he resigned in 1855, when he was succeeded by the late Professor Graham.

Sir John Herschel's scientific acquirements were not limited to the particular branch of astronomy with which his name is more generally connected. He also made some original researches in optics, and was an accomplished chemist and electrician. We do not propose here to give a complete list of his writings, nor of the honours which he received from many other countries. But we would mention the peculiar charm with which he contrived to invest somewhat abstruse subjects, and the successful manner in which he popularized scientific teaching. After his retirement he still occasionally used his pen in the service of the public, and within the last two or three years he contributed to 'Good Words' a series of popular articles on the wonders of the universe.

At the request of many eminent scientific men, Sir John Herschel was buried in Westminster Abbey, on Friday, the 19th instant.

Sir John Herschel married in 1829 Margaret Brodie, daughter of the Rev. Dr. Alexander Stewart, by whom he had nine daughters and three sons. He is succeeded in the title by his son Mr. William Herschel, of the Bengal Civil Service, who was born in 1833.

JAMES YATES, F.R.S.

We regret to have to announce the death of Mr. James Yates, M.A., F.R.S., which took place at his residence, Lauderdale House, Highgate, on the 7th inst. Although better known of late years as the chief and liberal promoter of the International Association for the introduction of the Metric System of Weights and Measures into this country, he was distinguished by his classical and scientific attainments. His learning was not only very extensive, but profound and accurate, and he contributed largely to several classical and archæological works. He always took an active interest in the proceedings of the Royal Society. He was also an influential member of the Geological Society, and of other learned and scientific bodies.

Review.

Commentar zur österreichischen Pharmacopœ, ein Handbuch für Apotheker, Sanitätsbeamte und Aerzte, mit Rücksicht auf die wichtigsten Pharmacopœen des Auslandes. By F. C. Schneider, Professor at the Imperial Josephinum, and Dr. Aug. Vogl, Lecturer at the Vienna University. 3 vols.; 2nd edition. Vienna: Manz'sche Buchhandlung.

This is a capital book, every page of which bears witness not only that the authors are fully at home in the matters they treat of, but also that they have the rare gift of communicating their information in a lucid and attractive manner. The student is carried along from one subject to the next, seldom without gaining some new and useful information; he soon learns to handle the book as a reference on any subject connected with practical or theoretical pharmacy, and will not readily lay it aside.

The authors have divided their labour in such manner that Dr. Vogl has, in the first volume, worked out pharmacognosy, and Dr. Schneider, in the second volume, treats the chemico-pharmaceutical part; whereas the third volume contains a German translation of the Latin sixth edition of the Austrian Pharmacopœia, with many additional remarks and references to foreign Pharmacopœias.

The first volume, on pharmacognosy, by Dr. Vogl, is divided into a general part, treating of methods of microscopical investigations, and of the origin and condition of vegetable drugs, the collecting, drying and storing of the same; and a special part, classifying the drugs according to their origin, from the vegetable, animal, or mineral kingdom. Those derived from the first source are of course vastly predominant, and they again are grouped under three divisions, viz. :—

Plants or parts of plants, directly recognized as such.

Vegetable substances, the organic structure of which can be recognized only by the microscope.

Vegetable substances without organic structure.

There are, of course, many subdivisions, botanically arranged, which we cannot enter into just now, but the principal classification will at once show the scientific character the author imparts to his book. He does full justice to the botanical, chemical and physical characteristics of the different articles, their adulteration, etc., but above all, and wherever possible, he calls in the aid of the microscope, either to bring out new characteristics or to strengthen those hitherto known. He dwells so strongly on the value of microscopical investigations that we must give his own words in the preface.

The microscope, he says, opens up to us the structural relation of organized parts; not only does it present to us a clear view of the manner in which primary organisms combine into membranes, and how these, in wonderful variety, build up vegetable substances, but it also affords us an insight into the workshop and habitation of the products resulting from the processes of vegetable life.

By placing the structure of drugs before us, the microscope collects for us a series of characteristics, which, because not changeable, are highly valuable for the recognition and distinction of substances which defy other means of inquiry. And further, while obtaining a clear representation of the distribution of the active principles in the different parts of plants, we may often form an opinion of the quality of a substance, or obtain information in regard to the most suitable season for collecting, or the best manner of preparing and storing different vegetable remedies.

The author has most carefully studied the characteristic elementary construction of the plants, he has recorded the results of many micro-chemical investigations, often illustrated by capital woodcuts from original drawings, which assist in distinguishing in a simple manner many officinal herbs, even in powder, such as belladonna, hyoscyamus, digitalis, senna, etc.

The general part opens with a detailed description of the microscope, aided by clear woodcuts, and often containing good practical advice. For instance, it is often of great advantage to sketch the object under the microscope, *i. e.* to reproduce the microscopic view as accurately as possible. Many forms of apparatus, often very expensive, have been constructed for this purpose: the glass prism, the camera lucida, Soemmering's mirror; but they may all be dispensed with by acquiring the "double sight." If we look with one eye into the microscope, and with the other on a sheet of white paper placed at the side of the instrument, the sight with the picture of the object will be projected into the other eye, and with steadiness of the eyes the outlines of the picture may be drawn very accurately.

Under preparation of objects, the difficulty of getting fine sections of small or thin substances, such as leaves, is overcome by cutting a cork in two, placing the leaf between the two halves, and binding them firmly together with a string; it is easy to cut off thin slices of the cork, and each will carry a very thin slice of the leafwith it.

We are much tempted to follow Dr. Vogl's details of micro-chemical reagents, but we will only quote the application of colouring matters.

Organic compounds are divided into two classes, those which take up colouring matter, and those which do not do so. The first class comprises albuminous compounds, tannin, certain alkaloids, etc.; the second cellulose, starch, gum, etc.; but the latter by being permeated by the members of the first group, acquire the quality of taking up colouring-matter, either directly or after treatment with mordants, caustic lye, sulphuric acid, alum.

The coloration brings out certain structural arrangements, otherwise indistinct or invisible; the gradation in colour separates whole parts of membranes more completely than in the colourless state, and the presence or absence of colour, indicates the presence or absence of certain substances, their locality, and to a certain extent even their relative proportion.

We next come to an exhaustive treaty on cells, cell-membranes and their contents, which are described as under starch, inulin, sugar and dextrine, gum and mucilaginous matter, tannin, protein, fat, essential oils and resins, colouring matter, alkaloids, crystals (acid, alkaline or neutral salts), gases. This part is richly illustrated by wonderfully clear woodcuts; it is almost a book within a book.

The last division of the general or introductory part speaks of the origin and condition of vegetable substances, and it is perhaps more important to the German reader, because in Germany many plants or parts of plants which have been excluded from our Pharmacopœia, are still officinal, and also because German pharmacists, wherever possible, collect herbs, flowers, roots and seeds when fresh, and dry them, and store their supply from year to year. As the amount of active principle in the plants—and hence their medicinal value—is greatly influenced not only by cultivation, by the season, the climate and the soil, but also afterwards by the drying, preparing and storing, all these different considerations are fully gone into and carefully described.

The work is so rich in a variety of matters, that it is impossible to do justice to the authors in a single article; and as the readers of the Journal will not be disinclined to have before them a more detailed exposition of the advanced and earnest manner in which pharmacy is taught and treated on the Continent, we purpose giving a series of extracts from this last and valuable addition to pharmaceutical literature.

A New Wellingtonea Gigantea, forty feet four inches in diameter, which exceeds by seven feet the largest previously known, has been discovered near Visalia, in Southern California. A section of one of these trees is now being exhibited in Cincinnati, which is seventy-six feet in circumference and fourteen feet high. It was cut last year about two hundred and fifty miles south-east of San Francisco, far up the western slope of the Sierra Nevado mountains, and was carried on three waggons drawn by seventeen yoke of cattle.—*Nature.*

The following journals have been received:—The 'British Medical Journal,' May 13; the 'Medical Times and Gazette,' May 13; the 'Lancet,' May 13; the 'Medical Press and Circular,' May 17; 'Nature,' May 11; the 'Chemical News,' May 12; 'Gardeners' Chronicle,' May 13; 'Journal of the Society of Arts,' May 12; the 'Grocer,' May 13; 'Produce Markets Review,' May 13; the 'English Mechanic,' May 12; the 'Chemist and Druggist,' May 15; 'Journal de Pharmacie et de Chimie' for November and December; the 'American Journal of Pharmacy' for May; the 'New York Druggists' Circular' for May; the 'Photographic Journal,' May 16; the 'Brewers' Guardian,' May 15.

Notes and Queries.

⁂ *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department, 17, Bloomsbury Square, W.C., and not to the Publishers.*

[227.]—PREPARATION OF POMADES.—Not having seen any reply to the inquiries of your correspondent "*Moelline*," of the 22nd ult., I think I may venture to suggest to him to use less solid matter in the preparation of his pomades, and to have his bottles just warmed through, and the pomade just beginning to set before pouring in. At this season of the year I find 2 oz. of genuine beeswax is sufficient for 1¼ lb. of oil for solid pomade; in winter, 1¾ oz. is sufficient.

For crystalline pomade, "*Moelline*" will find 2½ oz. spermaceti sufficient for 1 lb. of oil in summer, and 2¼ oz. in winter.—W. PARRINGTON.

[231.]—BEETLE POWDER.—The recommendation of the *New York Druggists' Circular* of borax as a cockroach exterminator has been going the round of the papers to such an extent as to create a popular demand for the article for this purpose. I should like to know how it is to be applied, for it seems to me that nothing short of subcutaneous exhibition will suffice. It is recommended to be sprinkled in their haunts, but there must be some magic in "putting the salt on their tails," for I have nearly smothered them with borax, and kept them for seven days in a glass; but I might as well have subjected them to the pope's anathema, for "none of them seemed a penny the worse," but they were as brisk and lively at the end of the saline treatment as at the beginning. The experience of some housekeepers would lead to the opinion that what is poison at one period is food at another. Can any entomological correspondent explain?—HENRY H. POLLARD.

Powdered borax is a delusion and a snare as a poison for my blackbeetles. A quarter of a pound has been expended for their benefit, not mine; for they have eaten it all up, and are more numerous than ever.—J. B.

[241.]—WARTS.—If "*Omega*" has tried caustic and acetic acid, and failed, let him try liq. potassæ or Lugol's caustic solution of iodine.—J. B.

[242.]—IODIDE OF STARCH.—
Iodi gr. xxiv
P. Amyli ℥j.

Triturate the iodine with a little water; add the starch gradually, and continue the trituration till the compound is of a deep and uniform colour. Dose, ʒss to ʒij.—J. B.

[251.]—INKSTAINS.—Would any one favour me with a recipe for taking out inkstains?—QUERIST.

[252.]—DISPENSING.—Would any reader kindly inform me the best way of dispensing the following recipe?—

℞. Zinci Sulphatis ℈ij
Cupri Sulphatis gr. x
Mucilaginis Acaciæ ℥iv
Tr. Ferri Muriatis ʒiv
Aquæ ℥xij.

Mft. Injectio ℥ss ter die interdum.—ALPHA.

[253.]—ESSENCE OF RATAFIA.—What is the strength ess. ratafia is usually sold? I have been for some years in the habit of selling it in the proportion of 1 part essential oil to 7 parts s. v. r. (or sixteen times the strength of the formula given in the Journal of the 22nd April); and, as I think a uniformity in this article very desirable, it may be useful to have the opinions of our brethren through your "Notes and Queries" column.—AMYGDALA.

[254.]—ACIDULATED GINGER SYRUP.—Will any reader oblige with a form for making acidulated ginger syrup for aerated gingerade that will not exhibit flocculence after being bottled one or two months?—M. P. S.

[255.]—LIQUID GLUE.—*T. C. L.* would be glad if any reader could inform him what adhesive substance is used for joining cardboard or willow boxes together; something that sets hard directly.

COPAIBA JELLY.—At a clinical lecture delivered by Mr. Berkeley Hill, in University College Hospital, he exhibited a new preparation of copaiba in the form of a jelly, which he said was taken by his patients readily. It was bright and almost as firm as calf's-foot jelly, very attractive by its rosy-red colour to the eye, and not repulsive to the palate, its flavour being masked by peppermint. It contained 50 per cent. of copaiba. A piece as large as a filbert, rolled in wafer-paper, might be swallowed without being tasted at all. The after effects of nausea, diarrhœa, etc. are not more than, if so frequent as, from other preparations of copaiba. The specimen had been prepared by Mr. Martindale, dispenser to the hospital, according to the following formula, which was an improvement made by him upon the original one:—

Take of Thick Copaiba ℥viij
Powdered Sugar ℥iv
Honey (not crystallized) ℥iv
Distilled Water ℥v
Oil of Peppermint ʒj
Roseine (dissolved in ♏xx water) $\frac{1}{15}$ gr.

Put the honey, sugar, copaiba and water into an evaporating dish. Keeping it well stirred, heat the mixture gently till it boils, and continue the agitation and ebullition about five minutes. In the first part of the operation two distinct strata are formed,—the upper, the copaiba; the lower, the honey, etc. As the water is evaporated, numerous bubbles of steam are given off, just as the whole becomes a homogeneous jelly. When it has partly cooled, stir in the roseine and oil of peppermint. When well made, it should resemble raspberry jelly. Should this very minute quantity of roseine (one of the aniline pigments) be objected to, an ammoniacal solution of carmine gives a very good colour.—*Lancet.*

OIL OF SANDAL-WOOD.—The following formula for the administration of oil of sandal-wood is suggested by Dr. Henderson:—

Oil of Sandal-wood ℥j
Rectified Spirits of Wine ℥ij
Oil of Cinnamon ♏xxv.

Dose, one or two drachms three times a day.—*Lancet.*

ZINC WATER TANK.—M. Zinrek reports in the *Lyon Médical* the results of examinations of water that had been kept for a long time in zinc tanks. He found that the water dissolved the zinc in proportion to the chlorides it contained, and the length of time during which it was in contact. Boiling does not precipitate the zinc from water charged with it. In a sample of water, containing a small proportion of chlorides, but which had been a long time in a zinc-tank, as much as fifteen grains of zinc was found in each quart. To prevent this state of things, the author recommends that zinc tanks be coated inside with an oil paint of which ochre or asphalte forms the basis. No minium, ceruse, or carbonate of zinc should be used. Fifteen grains in a quart seems an enormous proportion, nor does the author say whether he found the actual metal or a salt of oxide of zinc.—*Lancet.*

ANHYDROUS GLYCERINE.—M. Eberhard has called attention to the power possessed by absolutely anhydrous glycerine of withdrawing water by an exosmotic process from tissues to which it is applied. Marion Sims some time ago demonstrated that a ball of lint dipped in glycerine and applied to a freely suppurating surface arrests the secretion. Fürst has also applied the glycerine plug in a large number of cases of fluor albus, and M. Eberhard states that he has been very successful in applying the same means in similar cases.—*Practitioner.*

GLYCEROLE OF IODINE.—This preparation, recommended for loss of the voice, is composed of a solution of 16 grains of iodine in 1 oz. of inodorous glycerine.—*Medical Record.*

Correspondence.

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

Early Closing.

Sir,—I am happy to find that the importance of early closing to pharmaceutical students has been commented upon in your columns, and I think that if it were thoroughly investigated by the Council, the desired issue would be obtained. I have often wondered why drapers, grocers, etc., could close at an early hour, merely to give their young men an opportunity of enjoying themselves after their day's toil, whilst chemists cannot entertain the idea, although it would only afford those facilities for study which might be reasonably expected from an employer, especially during apprenticeship.

I quite agree with T. S. M. that compulsion is the only means by which early closing could be carried out effectually. The jealousy generally existing between pharmacists prevents anything being settled amicably by them. Like the dog in the manger, if they cannot derive any good from it themselves, they all take good care that no one else does.

Milford, May 15th, 1871. Filix.

Some Abuses.

Sir,—The ethical code of pharmacy dates even before the formation of the Pharmaceutical Society, and when Mr. Ince indited his well-meaning paper pharmaceutical ethics were practically a long stride ahead of what he apparently wished to inculcate. That a pharmacist be a gentleman is now generally admitted, the examinations proving an ordinary collegiate education without the special technical instruction required before obtaining the diploma. Jacob Bell, the founder of the Society, could never have wished that *in statu quo* in the matter of pharmaceutical progress that has characterized pharmacy since his lamented demise.

We require, as pharmacists, the respect, not only of the public, but of the medical profession. But very few of our craft are aware of the contemptuous manner in which the majority of doctors are in the habit of depicting to their patients our supposed contumacious, ignorant and unauthorized acts. That some enlightened, liberal and generous intellects would scorn so to do I am fully aware and gladly admit, but they unfortunately are the exceptions that prove the rule.

How many country surgeons or general practitioners, well able to diagnose a disease, and capable of calmly calculating the effect of quinine or iron on a debilitated system, rush to their dispensaries, and hurriedly throw together a mixture with enough sal volatile to precipitate the quinine or carbonate of soda, to render a soluble tincture insoluble and nearly inert.

As long as we, qualified pharmacists, are content to remain inactive on the subject of our rights and our just monopolies, so long must we—in order to obtain a livelihood, and some even a bare pittance—endeavour to snatch what few crumbs drop from the professional table. It has now passed into an axiom that as long as medical men dispense, pharmacists will prescribe. And yet I venture to say that no pharmacist ever does so without certain twinges of conscience. But what is he to do? Send the patient to Dr. X., who dispenses his own medicine? Nay! Why should he? To be rewarded by Dr. X.'s injunctions to the patient to distrust the whole body of chemists, and himself in particular, as ignorant meddlers? It is probable that the less enlightened members of the profession think that, if they were to give up dispensing their own medicines, the chemists would not give up counter-prescribing.

Then *crede experto!* I have lived on the Continent a number of years, and have made a study of pharmacy in its relation to medicine in various countries, and nowhere have I found so cordial an *entente* between two such hand-in-hand professions as in those countries where an official and recognized status is given to each. And when the pharmacist, instead of wasting his time in listening to a long detail of a child's health, sends the patient to Dr. L., in the certainty of seeing ere long a customer with a prescription and a contented countenance, is he likely to interfere in any such arrangement so eminently advantageous and mutually beneficial? Then why this apparent distrust on the part of the profession? They could now perform a graceful act, raising their own status, by recognizing, as Parliament has done, the separate and distinct qualifications of an educated and examined body of pharmacists.

Optimists say that this desired change is gradually being effected. I do not think that on reflection we can endorse that statement. Eminent men of large practice, and others whose increasing calls on their time necessitate the employment of every means to expedite their visits, naturally prefer writing a prescription to the bother of dispensing and sending out medicines. But in country towns and throughout England generally, I am sure that three-fourths of the work that ought to fall to the pharmacist is withheld from him, to the prejudice of a class legally qualified and officially intended to perform it. True principles of political economy are here violated, and continental countries, whose legislators it is the fashion to sneer at, have at least the merit of a clearer appreciation of the respective functions of medical and pharmaceutical science. Having obtained a legal status, it is the duty of pharmacists as a body to use their utmost endeavours to ensure their right of being the only legally-qualified dispensers of medicine, and to bring to an end the illegal dispensing by surgeons and other practitioners. The heads of the profession are in its favour, and a wholesome and firm agitation on the part of those most concerned could but be fruitful of ultimate benefit and success. We are certainly entitled to some privileges and considerations for all the stringent examinations and regulations voluntarily imposed upon ourselves in deference to the wishes and opinions of the public. A recent writer in the *Standard*, on the abandonment of the Poison Regulations Bill, mentions "the great privileges accorded to pharmacists." As yet, they seem totally intangible and imaginary, unless the exemption from serving on juries be considered a set-off to the innumerable difficulties which beset the thorny path that attends the obtainment of even a bare livelihood as a chemist and druggist.

E. A.

The Minor Examination and the Provincial Associations.

Sir,—In your Journal of May 6th are two or three letters on the subject of early closing,—want of time for study being brought forward as the main argument. One writer takes it for granted that where early closing is introduced, an association with classes, etc., will follow. In many towns this has been the case, but do these associations fulfil their purpose? With some honourable exceptions, I think they do not. In the city of 80,000 people from which I write, and which we will call Cathay, is an association of this sort. The following rough statistics will show how it is getting on:—

Number of pharmacies in the city, 40.
" assistants, 12.
" apprentices, 40.
Average time of closing, 7.30.

The association was started last autumn (solely through the laudable exertions of two assistants) with ample funds and about forty members, with many of the masters as honorary members.

Three classes on separate subjects have met each week, and the result is that the attendance at these classes averaged twenty-two for the first three weeks of the session and nine for the last three, at which number, I fear, it will remain all through the next session, should the association survive so long.

I attribute this falling off to the fact that the class-teachers go into their subjects thoroughly. To do this is not the object of the great majority of apprentices. They prefer to solve the problem as follows:—Given, utter ignorance of theoretical pharmaceutics as a base for three months' desperate cramming; required, to wriggle through the Minor Examination and then to fling up study *in toto*.

Till the Major is looked upon as the natural sequence to the Minor and the need is felt of getting up each subject thoroughly, the comparatively slow method of teaching by classes will not answer, except for students who have the whole day at their disposal. Let additional inducements (such as the title of Fellow) be held out to pass the Major, and this state of things will be altered. Instead of being regarded as a hideous ogre, holding up the bar of the Minor which must somehow be got over, under or round, the Pharmaceutical Society will be looked on as a guardian spirit, striving by its examinations and by other means to raise the trade in public estimation and to increase its *esprit de corps*.

Cathay, May 12th. PHILIP H. MASON.

P.S.—Will some correspondent kindly point out what advantage beyond the honour of the thing is, at present, gained by passing the Major?

UNIFORMITY OF CHARGES.

Sir,—Allow me to express my opinion that pharmaceutists, as a body, could not more effectually conduce to the future aggrandizement of their profession—for such it now strictly is or should be—than by manifesting their determination to suppress petty and unseemly jealousies, and to arrive at an amicable understanding with each other regarding uniformity of charges.

One naturally jumps to the conclusion that adulteration must be extensively in vogue when prescriptions such as the following are brought to be dispensed for sixpence, as happened to me:—

℞. Sp. Am. Co.
Tr. Opii,
Sp. Camph.
Tr. Rhei Co.
Ess. Menth. Pip.
Tr. Capsici, ana ʒij.
M. Cap. guttæ xx per dosis.

When I expostulated and urged that it was at the rate of cost price, I was informed that it had frequently been obtained at Mr. ——'s for that price; consequently, having dispensed it I had no alternative but to let the customer have it. Had I known this before preparing it, I should certainly have refused to stain my conscience and measure-glass with such a disgusting and glaring specimen of the worse than grocer-like system of cutting one another's throats.

The following, though somewhat notorious, is not one of Stratford's *protégés*, but was dispensed at Mile End for sixpence:—

℞. Lin. Saponis Co. ℥j
Tinct. Cantharidis,
Sp. Ammon.
Ol. Succinis Rect., ana ℥iij. M.

Unless Dame Fortune intervenes, we must evidently suffer the same fate as the proverbial Kilkenny cats of old.

Stratford, E. ROBERT H. KEELEY.

UNQUALIFIED ASSISTANTS.

Sir,—Among the various matters touched upon by your correspondents I am surprised that of allowing errand boys to serve behind druggists' counters has not been referred to. We hear much of professional qualifications, conscientious discharge of duties towards customers and the high position pharmacy should aim at, but not a word is said against these qualifications being diluted by an errand boy behind the counter.

In old times, errand boys were brought forward and many eventually became masters, then there was silence concerning qualification and position.

Things have changed. The Pharmacy Act prevents any person carrying on retail except under restriction, but it allows any compliant person's wife or errand boy to retail medicines during the absence of the principal. This seems anomalous, and affords little security to many of those for whose welfare the Pharmacy Act was passed.

It may be said that in a neighbourhood where the druggist's wife dispenses her smiles and medicines, and the boy mixes up the "antibilious," a poor population preponderates, but have not the poor quite as much claim as the rich to legal protection? M.P.S. BY ELECTION.

Notting Hill, W.

WHO DISCOVERED ETHER ANÆSTHESIA?

Sir,—As the public generally are always in an unhappy fog of innocent doubt as to the name of the first discoverer of Anæsthetics, and not five people in a thousand could tell the name of the man who made the first application of ether vapour to take away pain in surgical operations, perhaps you would find a corner for the interesting fact that a monument has been set up this year in America to commemorate the discovery. It may appear to some a little in the spread-eagle style; but all who have studied the history of anæsthetics will agree with the truth of the inscription.

A committee of American citizens at Boston have erected at Mount Auburn an appropriate monument to the memory of Morton. The inscription tells its own tale:—

"W. T. Morton, inventor and revealer of Anæsthetic inhalation.—Before whom in all time Surgery was Agony.—By whom Pain in Surgery was averted and annulled.—Since whom Science has controlled Pain."

The inscription is in four parts on the four faces of the monument. Next to his name stands, perhaps, that of Waldie, the chemist, who taught Sir James Simpson the use of chloroform, and first directed his attention to it, as set forth in this pamphlet of Waldie's brother, so disingenuously ignored, as well as this monument to Morton, by our medical journals; but the next generation will do honour or credit to Morton's memory. There are two monuments in the Hôtel Dieu in Paris, put up by the French people, one to Bichât, the other to Magendie. When shall we have one to Dalton or Davy, Wells or Morton?

CHARLES KIDD, M.D.

Sackville Street, W., April 25th, 1871.

BORAX AND BLACKBEETLES.

Sir,—I don't know how it is that paragraphs are concocted and go the round of the papers, and then disappear; when, if the information conveyed in them were only true, they would be immortal.

If, for example, it were only true that that domestic pest, the blackbeetle, can be got rid of by means of a little borax, as you state on the authority of the *New York Druggists' Circular* (p. 762, *ante*), there is not, I imagine, a druggist's shop in the kingdom that would not be besieged for supplies of borax. But, alas! English cockroaches, unlike their American congeners, have a profound contempt for pounded borax; they crowd over it and trample it underfoot, and, instead of "fleeing in terror from it, and never appearing again where it has once been placed," they seem rather to rejoice over it, and to haunt my kitchen in greater force than ever. And yet I have applied it three times!

If the other part of the paragraph is equally reliable, I shall not be disposed to tempt my laundress to "save nearly one-half her soap" by the use of borax.

I cannot, however, conclude without congratulating all pharmaceutical chemists on the excellent journal that reaches us weekly. T.

London, May 11th, 1871.

[*⁎* There seems to be a considerable diversity of experience on this subject. Only a fortnight since we printed (p. 897) a communication from a respected correspondent, in which he said that powdered borax, sprinkled in the haunts of blackbeetles, was certain destruction to them, and that he could vouch for its efficacy.—ED. PHARM. JOURN.]

QUALIFICATIONS FOR SUCCESS IN BUSINESS.

Sir,—"Another Associate" says, "with the qualifications necessary to pass the Modified, £1000 and a good opening for business, any one may leave all doubts about getting on to 'aspiring' members of the profession."

£1000 and a good opening for business are, I grant, at all times desirable aids, but not necessary qualifications, as I can testify from personal experience, for I had neither; and yet I have succeeded admirably, thanks to the professors in town.

My opinion is, that gentlemen holding the Major qualification, and possessing besides ordinary business capacities, are almost certain of success and that "Another Associate" will find their success greater than those who simply have £1000. F.C.S., PHARMACIST WITH HONOURS, ETC.

May 6th, 1871.

F. R. Riggall.—Blaine's 'Outlines of the Veterinary Art,' published by Messrs. Longman.

J. S. B.—The preparation inquired about is advertised as being prepared by Mr. Chapman, of 10, Duke Street, Portland Place, London.

A correspondent, signing himself "*Inquirer*," has not complied with the rule as to anonymous communications.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. C. A. Thredgale, Mr. C. G. Bunn, Mr. P. Howman, Mr. T. Collier, Mr. A. Barron, Mr. John Ingham, X. Y. W., G. W., T. C. L., F. H. W., A. P. S., C. S., A. S., "Persevero," "Arum," "Botanist," "Ferment," "Inquirer" (Brighton).

The Pharmaceutical Journal.

SATURDAY, MAY 27, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

LOCAL SCHOOLS OF SCIENCE.

THE increased attention that has been devoted during the last few years to the subject of scientific education, and the consequent recognition of the great benefits which would result from the more general possession of scientific knowledge, have already resulted in some practical attempts to supply the great defect which had previously existed. The universities have, to some extent, acquiesced in the claims of science to a place among the studies of those who are able to resort to them for education, whilst public and private efforts have been made here and there throughout the country to supply the needs of students in other ranks of society.

But the rate of progress has hitherto been comparatively slow, and the question from whence the funds are to be obtained for defraying the expenses attending the inauguration of science schools is one that has had and will have very great influence upon it. The thoughts of many who have been working for the spreading of such knowledge have often been turned to the rich educational endowments existing in this country, and many wishes have been expressed that the trustees of these funds should consider whether they might not be utilized to assist in gaining the desired end.

Such help has come in a recent offer from the authorities of the University of Durham of £1000 a year for six years towards the foundation of a school of science in Newcastle-upon-Tyne, with a promise that if the institution answers their expectations, the grant of £1000 annually shall be made perpetual. In order that the school might be carried on efficiently, it was desired by the University that their offer should be met by a guarantee of a like amount from Newcastle and the district. The matter has been taken up with great spirit. At a preliminary meeting subscriptions to the amount of £350 a year for six years were promised, and in addition the sum of £3000 spread over six years guaranteed. This amount has since been increased to £16,000, and it is hoped that a capital fund of £30,000 may be raised, with which it is intended to establish a college for the teaching of physical science as applied to engineering, mining, manufacture and agriculture.

As an instance of the valuable results arising from the union of scientific and practical knowledge may be mentioned the process invented by Mr. JULIUS ROBERT for the extraction of sugar from beetroot and sugar-cane by diffusion, as described by the late Mr. FERDINAND KOHN, in a paper read before the Society of Arts a few weeks ago, an abstract of which will be found in a previous number. Here was a manufacture which had been carried on for centuries upon what was acknowledged to be a primitive and imperfect principle, even the most perfect machinery failing to give a satisfactory result. But coming under the notice of a man who, while cognizant of one of the latest-revealed scientific truths, was also acquainted with the practical details and requirements of the manufacture, a process was invented which has already proved of great importance, and which was well described by the chairman of the meeting, Mr. G. C. T. BARTLEY, as "a most remarkable instance of the application of pure science to practical and commercial purposes."

On the other hand, Mr. MATTIEU WILLIAMS, in a paper on "Burnt Iron and Burnt Steel," read before the Chemical Society last month, illustrated the large amount of empirical knowledge sometimes acquired by workmen, which is either allowed to die with them as a trade secret or is not made generally useful, through the inability of those possessing it to explain the "reason why." Speaking of the difficulties which had to be overcome in the rolling of large iron plates and in the reheating of such great masses without burning them, he referred to the large wages which were offered to workmen who could conduct these furnace operations successfully. He said that he knew an illiterate black-faced workman who earned as much as £40 weekly by payments received as tonnage upon work done under his direction. Having watched this man and others similarly successful in furnace operations, he found that, by various devices—the philosophy of which they did not dream of understanding—they subjected the iron to the action of a reducing flame only, and so prevented its oxidation.

It is for the purpose of bringing scientific education into closer contact with such manufacturing skill that colleges like the one projected at Newcastle are intended: we believe they are sure to exercise a lasting and beneficial influence upon the future of our country, and to repay well any cost that may be incurred in their establishment.

We trust that ere long no part of the country will be without such a college, and that in this way, among other advantages, opportunities may be provided for the acquisition of thorough scientific knowledge, which is so indispensable for the proper exercise of a pharmacist's daily business.

A LECTURE will be delivered "On National Health," by Dr. ACLAND, at the Royal College of Physicians, next Friday, the 2nd of June, at 5 P.M.; and at the same time on Wednesday, the 7th of June, a course of three lectures "On War in its Sanitary Aspects, with special reference to the period from 1793 to 1815," will be commenced by Dr. GUY, and continued on the following Friday and Wednesday.

ON Tuesday evening the House of Commons went into committee on the "Adulteration of Food and Drugs Bill," but progress was immediately reported, and the House resumed.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

May 17th, 1871.

MR. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

Present—Messrs. Atherton, Bottle, Bourdas, Brown, Carr, Deane, Dymond, Edwards, Evans, Groves, Hills, Mackay, Reynolds, Sandford, Stoddart, Sutton and Williams.

Mr. Bourdas was elected Vice-President, and took the chair accordingly.

The Secretary presented a list of members whose subscriptions had been tendered subsequently to the 30th April.

Resolved—That the said members be restored to their original status on payment respectively of a nominal fine of one shilling.

The following letter was read, and ordered to be entered on the minutes:—

"*Medical Department of the Privy Council*,
May 4th, 1871.

"Sir,—The Lords of Her Majesty's Council, observing that the Annual Meeting of the Pharmaceutical Society is to be held in the course of the present month, direct me to refer you to my letter of the 23rd December, 1870, and to say that they trust that such regulations will then be made (under the first section of the Pharmacy Act, 1868) in regard to the keeping, dispensing and selling of poisons, as will be sufficient to secure the safety of the public.

"Their Lordships think it right to apprise the Council of the Society that, should no such regulations be submitted for their approval after the approaching meeting, they will feel it their duty to endeavour to protect the public by proposing to Parliament further legislation.

"I am, Sir,
"Your obedient servant,
"JOHN SIMON.

"*The Secretary to the*
"*Pharmaceutical Society*,
"*Bloomsbury Square*."

Resolved—That the letter be read at the Annual General Meeting, and that copies be distributed among the members present.

The Council then adjourned to the Annual Meeting.

THE
THIRTIETH ANNUAL GENERAL MEETING OF THE PHARMACEUTICAL SOCIETY.

Wednesday, May 17th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The SECRETARY having read the notice convening the meeting, the President delivered the following address:—

Gentlemen,—Two months ago I little expected that I should on this day have the honour and pleasure of addressing you from this chair. As there is no rose without a thorn, so the pleasure comes not unalloyed. You will readily understand the allusion, viz. the retirement of Mr. Sandford from the post I now fill. I feel assured that you will not only look for it from me, but strongly approve of my paying a passing tribute to the merits of that gentlemen, one of the best Presidents the Society ever had. I know his value well. You cannot estimate too fully the loss of so upright, so able, and last, but not least, so patient a chairman.

Thirty years ago a paper was read "On the Constitution of the Pharmaceutical Society of Great Britain," at the Introductory Pharmaceutical Meeting, held May 11th, 1841. For as many years have I, first as an associate, then as a member, watched the steady advancement of the Society. During that time I have observed many changes. I have seen the good ship threatened by storms from within and from without, surrounded ofttimes by shoals and quicksands, but ever buoyant, ever seaworthy, coming safe into harbour, avoiding Scylla and not falling into Charybdis. I call to mind now words spoken by one who has grown grey in your service, "that the Pharmaceutical Society would at some future day become a very great and influential Society." I endorsed his words then, I endorse them now; and why? Because it is based upon good sound principles; by educational means expanding, training and raising the mental qualities, striving by union for the good of each other, and conferring a corresponding advantage upon the general public by providing for it not merely an intelligent class of pharmaceutists, but also an educated intelligence, for natural talent and intellect lose nothing, but gain much, by cultivation. "The human mind, without education, is like marble in the quarry, which shows none of its inherent beauty until the skill of the polisher fetches out the colour."

Following the steps of those who have preceded me, I might remind you of novelties introduced and of the results of scientific research during the past year, but all these are now so freely published that they who run may read. Nevertheless, there is one preparation in particular which I cannot pass unnoticed, the hydrate of chloral; known before the past year, yet happily never before called so largely into requisition at home or abroad (during the war) for the relief of thousands of suffering fellow-creatures. In a lecture delivered in February last, Dr. Richardson stated that nearly fifty tons of the hydrate had been used in England during the previous eighteen months. He also stated—and this may be interesting to pharmaceutists, as showing the necessity of discretion in its employment—"that in professional hands, now that its action is better understood and the novelty of its application worn off, the employment of it is less than it was some months ago; while the practice of resorting to it by the public is on the increase, and a new class of cases is thereby becoming known, marked by particular symptoms, and assuming in some instances a serious character."

Among many other things which during the year have engaged the attention of correspondents in our Journal I have observed the question of *early closing*,—a question eminently interesting, and meriting earnest attention; but I have always felt, that whilst it is a matter in which each may do much by example and otherwise in his own immediate neighbourhood, it would be quite out of character for residents in one quarter of any large city to legislate for those in another. At some establishments in this metropolis closing commences at 8 o'clock P.M., an hour at which in others the main business of the day virtually begins, when an assistant so situated might exclaim, with Sterne's starling, "I can't get out—I can't get out!" The reason put forward not unfrequently in favour of early closing is, that apprentices and others may have time for study; and the reason, so far, is a good one. No one can well appreciate the value of opportunities for study more than those who have known and felt the want of such. Where were they thirty years ago? I trust that those who have opportunities will not only value them, but make much of them.

"To catch dame Fortune's golden smile,
Assiduous wait upon her;
And gather gear by ev'ry wile
That's justified by honour:
Not for to hide it in a hedge,
Nor for a train-attendant,
But for the glorious privilege
Of being independent."

This reminds me that I should make some remarks anent our Examinations. In so doing, I would invite your attention to that portion of the Annual Report which bears upon them. If a doubt ever existed in the minds of any respecting the nature and mode of conducting the Examinations, the passages extracted from Dr. Greenhow's communications thereon, published in the Twelfth Report on Public Health by the medical officer of the Privy Council will, I feel confident, at once dispel it, so far at least as the present Examiners are concerned. Personally (*ex officio*) I have taken great interest in the Examinations, and have been an earnest participator in all the duties of the Board, and I can say truly that I have never been associated with gentlemen more considerate and conscientious.

In continuation, a few words upon the Preliminary Examination may not be out of place, as many opinions have been expressed thereon. Some think it is too severe; others, that the Latin is more than should be expected; and again, that the questions are not always equal; that is, that they are more difficult upon one occasion than upon another. It may be so with some of the questions, but they are balanced by others equally easy; many, indeed, simply elementary. For my own part, I can scarcely see how the examination can be lighter, if, indeed, it is to be an examination at all; though candidates who have been some time from school may find Cæsar difficult to work up, the Pharmaceutical Latin required is only such as should be known by every one behind a chemist's counter; but in the face of this, some of the oldest candidates pass the best examination in Latin and arithmetic and some of the youngest the worst. Forty years ago, before this Society was established, a lad about to be apprenticed to a chemist was supposed, under any circumstances, to know something of Latin, for no prescriber in those days thought of putting any portion of his prescription in the mother-tongue; and now, after thirty years' existence of a Society, one of whose prominent features was and is an improved educational condition, can any say that he did not think Latin would be required? Any unbiassed person examining the written answers in the Preliminary Examinations, would be forcibly struck with what seems to indicate, in a large proportion of the cases, an utter absence of training in preparing for this examination; the work done represents the work of youths who have no one to guide, none to direct their studies and well-intentioned labour. I do not mean grinding or cramming. I hesitate to be more explicit. Gentlemen —like the author of a "Botanical Student's Dream" (*vide* PHARM. JOURN., March 18th, 1871, p. 745), and all those who take an interest in the young—will, I doubt not, comprehend to what I allude, for the young stand in need both of encouragement and guidance. Thus far I have said nothing of the Benevolent Fund, as it is pretty fully treated in the Report; but I may mention that the *first* legacy of £19. 19*s*. has been announced from the executors of the late Mr. C. Coles. Had Mr. Coles been spared to us, he would have been a valuable member. I am now fast approaching the end of that which I have desired to say, leaving to the last the most important question which will be brought before you for consideration to-day. The poison regulations have occupied the time not only of the Council, but more or less of all classes connected with pharmacy, the Council yielding,—when not to have done so might have been construed into unnecessary persistency,—determined, whether wisely or not I pretend not to say, to offer to this meeting certain recommendations to be observed in the keeping, storing and dispensing of poisons, for voluntary adoption. In considering this question when it comes before you, let me ask you, in all seriousness, to bestow upon it that quiet and calm consideration with which, on many previous occasions, you have been justly credited, and for which you had established a well-merited prestige. Before taking the final plunge, let me impress upon you this one word—Think.

"Facilis descensus Averni:
Sed revocare gradum, superasque evadere ad auras,
Hoc opus, hic labor est."

A word or two now upon my own account. This, gentlemen, is my first appearance, at a short notice, in this character; it may be the last; a few hours or a few days may send me amongst the rank and file. Be that as it may, I shall still labour in the cause of pharmacy and the Pharmaceutical Society; shall still respect the names of those Seniors who foreshadowed and established this our position; and as I have ever done, shall still take an interest, not only in this Society but in all those who follow the arduous and exacting occupation of a pharmaceutical chemist, or chemist and druggist.

The PRESIDENT called upon the Secretary to read the Report of the Council. It was resolved that the Report be taken as read.

REPORT OF THE COUNCIL.

In presenting the report of the proceedings of the past year, the Council commence as usual with some observations on the financial condition of the Society.

The Balance Sheet has been long enough in the hands of members of the Society to have been carefully read and considered, and doubtless has been compared by many with the statement of 1869, which exhibited a balance in the treasurer's hands at the close of the year considerably larger than the present, as well as larger investments made during the year in Government Securities. That year commenced with a much heavier balance, and another circumstance may be mentioned explaining the difference, namely,—an alteration in the time of receiving from the Publishers certain proceeds of the Journal, which at the end of 1870 amounted to £1586. 18*s*. 6*d*. due to the Society; had this been a receipt instead of an asset, it would have given the balance of the past year an advantage over its predecessor.

The true gauge, however, of prosperity must be looked for in the subscriptions and fees of the year, and under this head at first glance there seems to be a falling off; this must not, however, be taken as conclusive, because it arises from a decrease in the amount of registration fees of chemists and druggists in business before the passing of the Pharmacy Act, 1868: in those paid by assistants entitled to be registered on passing a Modified Examination; and also in the entrance fees of chemists and druggists. These items must lessen year by year, and ultimately disappear entirely from our financial statements. The subscriptions *proper* show an increase of nearly five hundred persons, who have become connected with the Society in the various grades since our last report.

On the debit side of the account a heavier amount than usual appears for apparatus; caused by the purchase of the large and valuable assortment collected from time to time by Dr. Redwood during his long connection with the Society. The Council before deciding on this purchase took advice from one of the most eminent philosophical instrument makers in London, and had the apparatus thoroughly examined by a Committee, both of whose reports were conclusive as to the desirability of the Society securing, under such favourable terms as Dr. Redwood had offered, this important collection.

The great increase in the business of the Society, and the greater number of clerks required for its performance, rendered it necessary in 1869 to remodel the office, involving a considerable outlay, part of which appears in the account of 1870.

The commission on laboratory fees paid to the Director and Demonstrator does not accurately give the expenditure of 1870, the commission on the fees of the previous year from October to Christmas being included in the £616 now debited. To accommodate additional pupils in the laboratory certain alterations, which were

FINANCIAL STATEMENT, FROM JANUARY 1ST TO DECEMBER 31ST, 1870.

Dr.

	£ s. d.	£ s. d.
Balance in Treasurer's hands, January 1, 1870		950 3 1
Government Securities . . . Interest		264 18 9
Life Members' Fund . . . Fees	57 15 0	
Interest	85 1 7	142 16 7
Subscriptions:		
1802 Members, Pharmaceutical Chemists	1,892 2 0	
393 Members, Chemists and Druggists	412 13 0	
189 Members, Chemists and Druggists elected 1870 . . £198 9 0		
189 Entrance Fees . . 396 18 0	595 7 0	
82 Associates in Business	86 2 0	
458 Associates not in business	240 9 0	
564 Apprentices	296 2 0	
Arrears	111 16 6	3,634 11 6
Fines on Arrears		6 0 0
Laboratory . . . Fees	1,185 11 0	
Breakages	4 6 5	1,189 17 5
Lectures . . . Fees		203 14 0
Registration Fees:—		
71 Pharmaceutical Chemists, Major Examination	409 10 0	
196 Chemists and Druggists, Minor Examination	621 12 0	
264 Chemists and Druggists, Modified Examination	277 4 0	
630 Apprentices, Preliminary Examination	1,323 0 0	
467 Examination Fees	490 7 0	
41 Registration Fees as Chemists and Druggists in Business	215 5 0	
11 Jury Certificates	0 11 0	3,337 9 0
Rent		100 0 0
Stationery,—Sale of printed matter		15 12 1
Sundries		3 17 0
'Register,' Sale of		183 10 6
Deposit Note, repaid by Bankers with £31. 15s. 2d. Interest		1,031 15 2
		£11,064 5 1

Cr.

			£ s. d.	£ s. d.
Balance due to Secretary, January 1, 1870				3 0 10
Government Securities:—Investment			1,096 10 0	
Transferred to Benev. Fund			500 0 0	1,596 10 0
Advertisements				33 17 4
Apparatus				324 15 6
Annuities:—Dr. Redwood				25 0 0
Carriage				3 18 6
Commission, Collecting Subscriptions, etc.				36 7 1
Conversazione			188 3 11	
Pharmaceutical Meetings			18 16 2	207 0 1
Examiners, Boards of (England and Scotland)				855 17 2
Fixtures and Fittings				179 9 8
Furniture				40 2 0
Gratuity to Mrs. Harrison, late Porter's Wife				10 0 0
House Expenses				67 11 1
Journal, Balance of Account				1,848 14 8
Laboratory:—				
Director's Salary		£200 0 0		
Percentage on £583. 0s. 6d., Fees received from Oct. to Dec. 1869	£145 15 1			
Percentage on £1185. 11s. 0d., Fees received during 1870	295 3 5	440 18 6	640 18 6	
Demonstrator's Salary		100 0 0		
Percentage on £583. 0s. 6d., Fees received from Oct. to Dec. 1869	58 6 3			
Percentage on £1185. 11s. 0d., Fees received during 1870	118 1 3	176 7 6	276 7 6	
Assistant-Demonstrator's Salary			65 0 0	
Porter's Wages			80 13 0	
Chemicals, Gas, Coke, etc.			194 15 8	1,257 14 8
Law Costs				261 0 10
Lectures:—				
Professor of Chemistry and Pharmacy			300 0 0	
Professor of Botany and Materia Medica			300 0 0	
Subscription to Botanic Gardens			21 0 0	
Prize Medals, etc.			7 14 6	628 14 6
Library				86 8 10
Museum:—Curator's Salary			100 0 0	
Specimens and Sundries			65 15 3	165 15 3
Expense of the Society in Scotland				95 14 1
Postage				155 4 11
Repairs and Alterations				488 13 6
Rent, Rates, Taxes, and Seven Years' Insurance in advance				571 19 10
Repayments				25 17 6
Stationery, Engraving, Printing, and Office Expenses				275 5 0
Salaries:—				
Secretary and Registrar			450 0 0	
Assistant-Secretary and Deputy-Registrar			187 10 0	
Clerks and Servants			530 1 0	1,167 11 0
Sundries, General			11 12 9	
Expenses incurred in second scrutiny of Votes for Election on the Council, the first return having been found incorrect:				
Fees to Scrutineers			23 2 0	
Turquand, Young, and Co., Accountants			16 2 6	50 17 3
Travelling Expenses (Country Members of Council)				229 15 6
Refreshments for Council				14 3 9
'Register,' Cost of Publication				252 6 9
Registrars' Certificates of Death				8 6 10
Local Secretaries' Expenses				9 16 11
Balance in Treasurer's hands				69 18 0
Balance in Secretary's hands				16 16 3
				£11,064 5 1

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement; and that there was standing to the account of the Society, at the Bank of England, on the 31st December, 1870:—

General Fund	New 3 per Cents.	£10,200 0 0	
Life Members' Fund		2,890 0 0	
			£13,090 0 0
Benevolent Fund	Consols.	11,500 0 0	
Pereira Memorial Fund		100 0 0	
			11,600 0 0
Bell Memorial Fund	Do.		2,050 0 0
Secretary's Casual Relief Fund	Do.		105 0 0
The Hills Prize Fund	Russian Bonds (at Bankers)		200 0 0

FREDERICK BARRON,
WILLIAM HODGKINSON,
JOHN BRUNT MACKEY,
WILLIAM SQUIRE,
Auditors.

BENEVOLENT FUND, 1870.

	£	s.	d.	£	s.	d.
To Balance in Treasurer's hands (Jan. 1, 1870)				421	15	4
,, Dividends on invested capital				315	11	6
,, Donations	£98	4	0			
,, Subscriptions	586	16	9			
				685	0	9
				£1,422	7	7

	£	s.	d.	£	s.	d.
By 10 Annuitants, to Christmas, 1870, at £30 each	300	0	0			
,, 2 Annuitants, elected Oct. 1870 (2 months to Christmas), at £5 each	10	0	0			
				310	0	0
,, Grants:—						
Member, London, 4th grant, now a Candidate for Annuity	20	0	0			
Member, at Jersey, from 1852 to 1868, age 64, cripple from rheumatic gout, elected an Annuitant, Oct. 1870	10	0	0			
Widow (with three children) of a late Member in Kent	20	0	0			
Orphan daughter of a late Member at Southampton (fourth grant)	10	0	0			
Member at Oxford	10	0	0			
Widow of a late Member at London, age 51 (fourth grant)	5	0	0			
Member, late of Watford, age 58	10	0	0			
Widow of a late Member at Lancaster, age 62, now a Candidate for an Annuity	10	0	0			
Registered Chemist and Druggist at Brighton, age 48	15	0	0			
				110	0	0
,, Balance due to Secretary, Jan. 1, 1870	0	0	3			
,, Premium on the Orphan Bentley's Policy of Assurance	1	11	2			
,, Advertisements	2	1	0			
,, Postage	8	19	3			
				12	11	8
,, Printing and Stationery				13	10	0
Purchase of £961. 12*s.* 10*d.* Consols				891	5	10
Balance in Treasurer's hands (Dec. 31, 1870)				85	0	1
				£1,422	7	7

February 23, 1871.

Consols, 31st December, 1869	£10,000	0	0
Consols, purchase of, as above	961	12	10
Consols, purchase of (transfer of £500 from General Fund Account)	538	7	2
Total invested Capital	£11,500	0	0

We, the undersigned Auditors, have examined the above Account, and find the same correct.

FREDERICK BARRON,
WILLIAM HODGKINSON,
JOHN BRUNT MACKEY,
WILLIAM SQUIRE,
Auditors.

February 23, 1871.

mentioned in the report of last year, appear on this occasion as increasing the item of "Repairs and alterations."

The Council have been encouraged by the greater use made of the library to increase their outlay in the purchase of books. The selection has been carefully made from month to month by the Library Committee.

It will be observed that the cost entailed upon the Society by the publication of the Register, in conformity with the Act of 1868, has been reduced from £245 in 1869 to £68 in the past year, with the satisfactory prospect of a still further diminution of expense in future issues. In noticing the 'Register,' the Council would draw attention to the great difficulty experienced by the Registrar in keeping it correctly,—a difficulty mainly caused by unreported retirements, changes of residence and deaths. The Council would urge upon members the great assistance they may afford the Registrar, by sending timely information of changes which take place in their neighbourhoods.

The remarks on the Financial Statement cannot be closed without alluding to the pension granted to Dr. Redwood when the change in the editorship of the Journal occurred in July last. Dr. Redwood had been so long connected with that publication, and had devoted so many of the best years of his life to its service, that the Council felt it but an act of justice to give him such an acknowledgment of his labours.

It will be remembered that at the close of the meeting of 1870, a resolution, proposed by Mr. Schacht, was carried, expressive of the opinion that the means hitherto adopted by the Society for the advancement of Pharmaceutical Education were no longer adequate to the necessities of the times, and urging the in-coming Council to consider some scheme for enlarging the usefulness of the funds at their disposal.

The Council, mindful of the altered condition of the Pharmaceutical Society,—no longer a merely voluntary association, but one to which all intending chemists *must* apply for authority to exercise their calling, and, failing to possess a sufficient educational qualification, would fail to obtain that authority,—immediately after its first meeting issued inquiries to the various Provincial Associations, and founded on the answers thereto, a Report which was published in the Journal. Certain recommendations having been adopted, forms of application for aid were prepared; these, however, were found to require reconsideration, and some alterations were consequently made which it is hoped will render them more practicable. The subject is not an easy one, as the fund available for the purpose is small, yet the Council trust some aid may be afforded to those who are anxious to advance their professional education, but are residing in localities where chemists are not sufficiently numerous to maintain public schools for that purpose. One great advantage arising out of the purchase of Dr. Redwood's apparatus—an advantage which had due weight in deciding on the purchase—is, that some portions of it are adapted for the illustration of lectures, and may be lent on certain conditions to Provincial Associations.

The Council have great satisfaction in drawing attention to the following passages from the Reports on the Examinations of the Pharmaceutical Society of Great Britain by Dr. Greenhow, published in the Twelfth Report on Public Health by the medical officer of the Privy Council:—

"The technical examinations are made as practical as possible. The prescriptions submitted to the candidates are very various in character, and have all been actually written for patients and dispensed in chemists' shops. The ability to read prescriptions is obviously one of the most necessary qualifications for chemists and druggists, and a large proportion of marks has therefore been very properly allotted to this subject in both the Modified and Minor Examinations. When present I have observed that although most of the candidates can read ordinary prescriptions correctly enough to ensure their being able to dispense from them with safety, comparatively few are sufficiently conversant with Latin to read with accuracy prescriptions couched in somewhat unusual terms, or having appended to them minute directions for use in the Latin language. The already-recited regulations sufficiently show the scope of the several examinations in the other subjects, and I may add that the selection of specimens submitted to candidates for recognition is well calculated to test their practical knowledge.

"I have closely observed the mode of conducting the several technical examinations by the appointed examiners, and can bear testimony to the zealous and conscientious manner in which these gentlemen discharge their duty. On some occasions I have followed the same candidates through their examination in all the successive subjects, making my own estimate of the number of marks which they had earned in each subject, and then comparing this estimate with the number of marks assigned to them by the examiners, which has seldom shown any considerable discrepancy. On other occasions I have remained for a considerable time watching the examinations of successive candidates in the same subject, and have satisfied myself of their being conducted with perfect fairness and impartiality as between one candidate and another.

* * * * * *

"I have, in conclusion, only to repeat what has already been implied in my Report, that, in my opinion, the examinations of the Pharmaceutical Society are of such sort, and are conducted in such manner, as to constitute a sufficient guarantee to the public with regard to the qualifications of persons admitted to register under the Pharmacy Act, 1868."

The changes made last year in the publication of the Journal can scarcely be said to have had a sufficient trial. The largely increased expense caused by the weekly issue, the increase in the number of members, etc., have occasioned so much larger an expenditure than formerly, that sufficient advertisements have not been forthcoming to meet it.

At the last Annual Meeting, the following resolution, in reference to the regulations for the keeping, dispensing and selling of poisons, was adopted:—"That the subject be taken into consideration by the in-coming Council, and that a further report be made to the next Annual Meeting."

The consideration of this important question has occupied a considerable portion of the time of the Council during the past year. The various motions which have been brought forward and the result of the divisions thereon, have been published in the Journal. Yielding, however, to the opinions of a large number of pharmaceutical chemists and chemists and druggists throughout the kingdom, expressed at public meetings and in memorials, the Council have determined to submit to the meeting the regulations for adoption as *Recommendations.*

The Benevolent Fund has slowly but steadily advanced during the last few years. The dividends, however, arising from the invested capital being inadequate to meet the annual pensions,—the Council, in 1870, felt justified in transferring £500 from the ordinary Funds of the Society to this Fund. Twelve annuitants have been elected since Mr. Orridge (whose loss is greatly regretted) so strongly aided in establishing these grants and in generally furthering the objects of the Fund; occasional grants are also made where the Council consider them required and desirable.

All members of the trade are now eligible to receive aid from the Benevolent Fund, whether members of the Society or not; but it is a matter of regret that, while so many could well afford assistance, so few, comparatively, have come forward to help. It may be that men who are not members, and consequently are not called on for subscriptions to the Society, have not had the claims of the Fund brought immediately before them, but the Council believe that Local Secretaries might easily obtain their co-operation in so good an object.

During the past year Mr. Westwood, a very old member of the Society, and one who had for several years acted as an auditor of its accounts, has passed away, to the great regret of all who knew him.

The Council cannot conclude their Report without also expressing their sincere regret on account of the retirement of Mr. Sandford from the Presidential Chair; for, however opinions may occasionally have differed, they have uniformly admired the kind feeling, ability, patience and perseverance of their colleague.

The Registrar placed on the table the following:—

Register of Members, Associates and Apprentices of the Society.
Register of Pharmaceutical Chemists.
Register of Assistants.
Register of Apprentices or Students.
Under the Pharmacy Act, 1852.
Register of Chemists and Druggists.
Under the Pharmacy Act, 1868.

Mr. Wiggin (Ipswich): Gentlemen, I beg to move that the Report of the Council be received and adopted, and printed in the Journal and Transactions of the Society. I am very pleased indeed to have again the opportunity of addressing you, to come up again as I have done for many years, combining business with pleasure. As you have all, no doubt, read the Report, anything I could say would be quite a work of supererogation, particularly after the able manner with which our President, in his opening address, has commented upon everything connected with it. So far as regards the Finances, I must say I think the statements in the Report are hardly so good as usual; but I accept, as I feel myself bound to do, the explanations made by our governing body, those whom we have elected to serve us for the last year. I have nothing particular to say about that bone of contention amongst us, the Poison Regulations, because they will be the subject of remark hereafter; but I may say that I would rather we should manage our own work than let other people do it for us. There is one other matter which the Chairman mentioned, and upon which I feel very strongly, namely, the retirement of Mr. Sandford. We know the peculiar circumstances under which he retired, and I must say, that in electing to do so he did a very graceful act; one which, in my opinion, proved him to be a most honourable gentleman. I think he properly appreciated his position, and I hope and trust that by our votes to-day we shall show that the feeling of the majority of this Society goes with him.

A Member: May I ask whether, by adopting the Report, we also take the regulations as to the Poison Bill with it?

The Chairman: You do not. The regulations will be put to you afterwards as a separate question.

Mr. M. Carteighe: I beg to second the motion for the adoption of the Report.

Mr. Robbins: I should like to make a few observations with regard to the Benevolent Fund. In reading the Pharmaceutical Journal of last week, I was struck, upon looking over the list of subscriptions, with the smallness of the sums there enumerated. I searched the list for a great number of names which I fancied ought to be there, and found them only conspicuous by their absence. In looking over some of the large towns of great commercial importance, I found that the sums put down were really very insignificant, and there were other towns which I looked for in vain. I think it is a disgrace to such a body as the Pharmaceutical Society that this should be so; we are bound to look after the orphans and widows, the poor and the indigent of our own body. It is not only a duty which we ought to perform, but we should also look upon it as a privilege and a pleasure. I cannot fancy that chemists are less liberal and less charitable than other people. I think this must arise from the subject not having been placed prominently enough before the members generally. I am told that the donations, subscriptions and interest arising from funded property are not sufficient to meet the requirements of the annuitants, and when we see that the amount subscribed by the members does not amount to a shilling a head, I think it is time we took the matter into serious consideration. Our President has mentioned that we have recently had a legacy left us, and it is a remarkable fact that that is the first legacy left to the Benevolent Fund. We have not many Peabodys in our ranks, and therefore I shall not quarrel with the dead; but to the living I would urge that they take this matter into consideration and see whether, before the next meeting, we cannot put a more respectable list before the members.

Mr. Kent: Sir, my chief object in coming here to-day was to speak upon the subject which has been alluded to by the last speaker. I happen to know six large towns in the country from which you receive only £2. 7*s*., and there are above 100 respectable chemists doing a very large amount of business there. I do not think that those chemists are divested of feelings of sympathy for the poor in our class more than those chemists who do subscribe to our funds. I think it is due to the fact that their attention has not been drawn to the subject. I think if your local secretaries were specially directed to call attention to this matter, and make application to the different chemists of their localities, you would find a great improvement in the state of your Benevolent Fund. I hope that we have a good many of those local secretaries now present, and that their minds will be drawn to the subject; also that the incoming Council will encourage those gentlemen by sending a nice circular, so that it can be distributed amongst the chemists in their locality. I feel assured that we cannot exactly sleep comfortably in our beds if we neglect our widows and our orphans. I would further suggest that in the case of those chemists who are known to be well-to-do, and will not subscribe a farthing, if any of their friends should become dependent, it should be a question whether the Society should entertain any application from them. The various charitable institutions throughout the country, I believe, act upon that principle; and it again acts as a sort of stimulus on all parties during the time of prosperity, when they do possess the means to contribute something, to know that if the sorrows of life should come upon them, and their friends are left destitute, they will be cared for by the societies to which they have belonged, and to which they have subscribed. I am heartily pleased that attention has been drawn to this matter, and hope that after this day we shall have to congratulate ourselves upon the improved state of our Benevolent Fund.

Mr. Humpage: I should like to say a word, Sir, respecting this Benevolent Fund. I believe it is through apathy that many gentlemen have not come forward and assisted the Fund, and I think that generally they are not members of the Society. If they were, and had the Journal coming before them four times a month, they must see that the Benevolent Fund and its distribution does occupy a considerable portion of the Council's time and attention. When we bear in mind that three years ago there were about 2000 members of the Pharmaceutical Society, I did expect, when the doors of the Society were so widely, so kindly (I was going to say so lavishly) rolled open, a very large number would rush in. We asked them to come in and unite with us who had been working for thirty years. We had created the Society; we had in addition subscribed £10,000 for this Benevolent Fund—and all we asked them was, to come in and shake hands and help us. There could be no difference of opinion as to the desirableness of this fund. There might be a difference as to the proceedings at the Council table, but I repeat, there could be no difference as to the propriety of every member of the trade who can afford it giving an annual subscription to this fund, since all are eligible to receive its help. I hope and trust many country chemists will speedily join the Society, when their attention will be more completely called to its advantages; and depend upon it, if they have any prejudices, the more you can bring them in contact with the Society, those prejudices will be melted away. I have come in contact with many gentlemen who have prejudices. A short time ago a gentleman who lives in my neighbourhood, a man of standing, a man of influence, a man of character, and a man of position, launched a complaint to me to this effect,—I had no circular from the Council of the Pharmaceutical Society respecting these poison regulations, and I think I am as respectable a man as the 2000 who had the circulars. I am one of the 10,000 outside. I told him that he did not look at it in the proper light. I said, "Why have you not had a circular? Because you would not unite yourself with the Society. If I voluntarily keep myself back from joining a club, can I expect to have notice of the movements and doings of that club? Assuredly not."—"Sir," said he, "I never looked at it in that light; I see the justice of it; you are right."

Gentlemen, illuminate the trade generally, and you must have a very much larger income for distribution.

Mr. Vizer: Sir, I have one or two remarks I should be glad to make upon the Report. As touching the Benevolent Fund, I most fully concur with every word which has been uttered, and I would only add one suggestion respecting it; that is, in publishing the calendar, together with the members' names and residences, you should have a column stating the amount they subscribe to the Benevolent Fund. It would be very handy and convenient to those who were taking an interest in any case and canvassing for votes, because it would at once show the number of votes each member had; it would, at the same time, be a silent monitor to those against whose names a subscription was not found. Another matter is, that before the new issue of the Journal we used to have a report of the donations to that fund published monthly, which has recently been discontinued. I think that was a good plan, because it brought the matter prominently and frequently before the members. If that plan were readopted, it might stir up benevolence, and so help the fund. Another suggestion I would make is with regard to the library. I believe the rule at present is that the library shall be open up to six o'clock; might it not be extended, with advantage to many of the students and assistants in London, if it were open up to nine o'clock? Young men are out in the evening, and have an opportunity of reading in the library, but they cannot do so in consequence of the present regulations. Another point I would observe upon is the accuracy of the register. In last year's Report we were told that the register was very satisfactory. I am sorry to differ from that opinion. The experience I have had lately has told me it is anything but satisfactory. I believe, I may say, that in London there are from 150 to 200 addresses in the register which are wrong, and that in the whole of the country there are between 1000 and 2000 such wrong addresses. That is a very serious matter, because I believe if the register were taken into court, it would be no evidence whatever unless it were correct. The Act of Parliament, by clauses 9 and 10, provides against that difficulty, and gives the Registrar power to issue letters by which that register may be corrected. If the Council have the power, I think it would be well to exercise it; and before the publication of the register, every person should be required annually to notify his residence, and, in case of failing to do so, that his name should be left out, capable of being restored in after sheets up to a certain date upon payment of a trivial fine. I believe that a regulation of that kind is in force in the case of the Law Society, and that it would be a great improvement if it were judiciously carried out with the register of this Society.

Mr. Schacht (Clifton): Sir, the subject of the Benevolent Fund is one upon which I should be sorry to say one word that would seem like a damper upon the feelings which, I hope, more or less actuate us all. But however much the observations which have been made apply to us individually, I think they ought not to apply to us in our corporate capacity. It seems to me that benevolence should not be considered as the *first* duty, at any rate, of the Pharmaceutical Society. And moreover, whatever cause there may be for something like a lecture to us individually, I say I do not think it *does* apply to us in our corporate capacity; for, on the very balance-sheet we have in our hands, there is a sum of £500 which has been handed to the Benevolent Fund. The reason why I introduce the subject in this way is, that I wish at the same time to call attention to a statement in the Report in which I am very much interested, and with which my name is very politely again associated. I mean the subject I had the honour to introduce last year—provincial pharmaceutical education. I think, I may fairly say, that we owe the Council the expression of our gratitude for what has been done up to the present time. At any rate, the statements contained in the Report, and the action which they have taken, are as much, perhaps, as any of us, interested in the subject, had a right to expect at this stage of the history of the subject; but the admission made in the Report, and the action taken upon that admission, are, as yet, far from proportionate. And one of the arguments adduced for this poverty of action is the smallness of means available for the purpose. I rise not for the sake of complaining that more has not been done, but rather to express a hope that a great deal more will be done in this direction, which I consider to be one of such immense, I was going to say, paramount importance. You, Sir, in your opening address congratulated the whole profession of pharmacy upon the fact, that in the present day men who wanted to improve themselves had greatly better opportunities of doing so than in past times. I cannot help thinking that your attention has been rather limited to what you are accustomed to see in this institution, upon which have hitherto been concentrated all the resources of the Society. We complain that in the provinces scarcely anything has as yet been done, except by local effort; and it is a little galling to be told of the small amount that is at the disposal of the Council for this purpose. It may be so, but we think it a large sum. You have all noticed the fact that something like £2000 a year is spent on the education conducted in this institution. Something like £1200 are spent in the laboratory, and £630 in the lectures. Moreover, £500 are handed over to the Benevolent Fund, and thus education in the provinces is literally nowhere; and the only advance I can see is that a large purchase has been made of certain apparatus, valued at £300, which it is proposed shall be lent for lectures in the provinces. There are certain regulations, which seem to me to be intricate, in which I suppose money grants are hinted at, but their exact operation is made a little mysterious. Probably they are more generous than I think them to be. I am not in the least degree anxious to cavil, seeing that those regulations have first of all to stand the test of experience; but it is upon the spirit of the thing that I wish my observations to bear. We spare money for everything else, but seem to neglect that which, I think, is a paramount claim—the education of the mass of our young pharmacists. The accommodation at this school is only equal to about 100 pupils per annum, which is not more than a twentieth part of the number who require to be educated, and yet complaints are made that more do not pass the examination. I again say we have no opportunity other than in this establishment, nor any means of acquiring knowledge other than we had thirty years ago, which, instead of being matter for congratulation, is a disgrace.

Mr. Urwick: Sir, it would appear that there is some reason to suppose that some day or other we may fall short of funds if we give lectures in the country, but I think there is a way in which we may secure the requisite funds. It appears there are a large number of chemists and druggists who have all the privileges given them by the Act, but still not being members of this Society, we do not get their annual subscriptions. It would seem that there is a golden bar which prevents their entry, and that is the two-guinea bar. If that could be diminished, or even done away with altogether, I think the number of those men who stand outside would be greatly diminished, that they would come in, and that your annual subscriptions would greatly augment. Therefore, I would suggest that we should meet them in some way.

Mr. Radley (Sheffield): Sir, I feel very much gratified by the remarks which have just been made with reference to the educational question. I am connected with a local association which has endeavoured to establish a school and lectures for the benefit of the rising generation. Our difficulty is becoming rather serious in regard to funds for the maintenance of the lectures during the next few years. We can support our institution so far as the members are concerned as to finding rooms, library, chemical apparatus and a museum; but we are unable to get a sufficient number of pupils to meet the cost of the lectures. During the past winter we had twenty-four lectures on chemistry. To meet the expense of those lectures the association has had to pay £10. 10*s.* in addition to the pupils' fees; and if it is to be repeated in the various other branches of scientific knowledge it will be, as I have said, very difficult for us to maintain our position. We feel desirous to bring this matter before the Association generally; and, although the Council have done very well hitherto, we do hope in the coming year to succeed in getting help from them in this particular. A great number of our senior young men have taken advantage of the Modified Examination, and, therefore, do not go in for the lectures to the extent which all will have to do in the course of time. We feel it to be desirable that, at all events, for a few years we should have some monetary help to tide us over our difficulties. I am quite aware of the considerations that spring out of this from the number of schools there are in the country; but I think the thing might be met, and I trust it will be.

Mr. Slipper: Sir, there is an error in the casting of the Benevolent Fund, showing a deficiency of £10; and I should like to know whether it can be accounted for in any way.

Mr. Bremridge: There does appear to be an omission of £10; whether it be a clerical or printer's error I do not for the moment know. The money has, however, been expended, and the total is, I am sure, quite accurate.

At a later stage of the proceedings, Mr. Slipper announced to the meeting that Mr. Bremridge had shown him the auditors' account, in which the missing item was set out. It was, therefore, a printer's error.

The resolution for the adoption of the Report was then put and carried unanimously.

The Chairman: The next question before us, gentlemen, is that of the poison regulations. It is a very important one, and you will readily conceive my position in bringing the matter before you. At the last Annual Meeting it was remitted to the Council in this way,—that the subject be taken into consideration by the incoming Council, and that a further report be made to the next Annual Meeting. I shall not attempt to waste your time by using any arguments whatever, either in favour of or against the adoption of these regulations, as you know the Council a month ago decided upon presenting them to you as recommendations for your adoption. But it is quite right I should mention to you that it was considered by some that if they were adopted as voluntary regulations, the Privy Council could put their seal upon them, and the Act of Parliament would make them law, so that they would become compulsory. I also feel that I should read to you a letter received from Mr. Simon, medical officer to the Privy Council, about twelve days ago. The letter, which is addressed to the Secretary, is as follows:—

"Sir,—The Lords of Her Majesty's Council, observing that the Annual Meeting of the Pharmaceutical Society is to be held in the course of the present month, direct me to refer you to my letter of the 23rd December, 1870, and to say that they trust that such regulations will then be made (under the first section of the Pharmacy Act, 1868) in regard to the keeping, dispensing and selling of poisons, as will be sufficient to secure the safety of the public.

"Their Lordships think it right to apprise the Council of the Society that, should no such regulations be submitted for their approval after the approaching meeting, they will feel it their duty to endeavour to protect the public by proposing to Parliament further legislation.

"I am, Sir,

"Your obedient servant,

"John Simon."

I need scarcely tell you that this letter was very courteously acknowledged, but no further remark was made about it than that it would be presented to the Council at the earliest possible opportunity. With respect to the regulations or recommendations being made compulsory, supposing you adopt them to-day as voluntary, our Solicitor was instructed to draw up such a resolution as could not very well in common sense be made compulsory by merely adopting them as recommendations. These are the recommendations:—

"Recommendations by the Pharmaceutical Society of Great Britain for the keeping, dispensing and selling of poisons.

"1. That in the keeping of poisons each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

"2. Also that in the keeping of poisons, each poison be kept on one or other of the following systems, viz.

"(*a*) In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or

"(*b*) In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or

"(*c*) In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.

"3. That in the dispensing and selling of poisons, all liniments, embrocations and lotions containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally."

It only remains now for me to put the resolution as drawn up by our Solicitor for your consideration, and it is this: "That this meeting having considered the recommendations as to the keeping, dispensing and selling of poisons, prepared by the Council, desires the Council to propose them for voluntary adoption, but does not desire and does not prescribe them as or to become Regulations within the meaning of the Pharmacy Act, 1868."

Mr. Burden: Can we have the first clause of the Pharmacy Act read?

Mr. Flux, the Society's Solicitor, then read the first clause, which is to the following effect:—"From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poisons, or to assume or use the title chemist and druggist, or chemist or druggist, or pharmacist, or dispensing chemist or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or a chemist and druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council."

Mr. Bourdas (Vice-President): I beg to second the resolution.

Mr. Giles: Sir, I think the occasions are few when any society, be it a society for scientific, social or commercial purposes, may differ on points of administration with its appointed governing body. But I do consider the present is such an occasion, not only on account of its vast importance, but also on account of the fact that the Council bring before us a matter which we know by their own previous information they do not in their hearts approve, but in obedience to an expression of opinion utterly informal, and which I consider they made a mistake in respecting to the extent they have done. I find it is necessary to deal with this question not simply upon the resolution, because the resolution does not raise, as it appears to me, the vital point which is at the bottom of the whole thing. I find it necessary therefore to move an amendment, and I will just state to you what that amendment is. It is in effect a repetition of the same motion applied to the present regulations, which motion was brought before you a year ago by the Council. But I will tell you why I desire to do so. It is, that we may decide now upon the *principle* which underlies the question of the imposition of these regulations; that is to say, whether we have contracted an obligation to Parliament which we are bound to fulfil in prescribing certain regulations, I care not now much what they are, because in considering the details of such regulations, we are led away from the point, whether it is our duty to prescribe them or not. There has been a great deal of very verbose discussion upon the matter, and there was a very lengthened meeting a year ago. Ever since that time there has been continual discussion of it in letters in the Journal and elsewhere. But I venture to assert that the main point of the question, the intrinsic essence of it, has been very much kept in the background, while questions of detail have been under consideration, which are only of secondary importance, or questions which do not concern us, as for example, the necessity for these regulations at all. Sir, *we* are not the conservators of the public safety. Parliament is the conservator of the public safety, and Parliament has said in terms, about which there has been no vagueness or uncertainty or dispute, that regulations *are* necessary. It is then a question for us whether we will fulfil the obligation imposed upon us by Parliament, or whether we intend to measure our feeble power against its omnipotence. I wish to call your attention to what the obligations are which we have undertaken, and I venture to say that no person who has read carefully, as I have done, the Act itself, the debates which occurred in the two houses of Parliament upon that Act, and the leaders in our own Journal at that time, can come to any other conclusion than that it was the intention of Parliament to impose upon us the obligation of prescribing *some* regulations, that we understood it so at the time, and that we accepted the Bill and the privileges which the Bill conferred, laden with that obligation. The first clause of the Act has been already read, all that is essential to us I will read again. That the persons privileged by this Act shall "conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council." I cannot conceive that you can rationally interpret that Act of Parliament, unless you suppose it contemplated that these regulations should be prescribed. But let us turn to the debates which took place upon the passing of that Bill through the House of Commons. Permit me, however, first of all, to turn to the leading article in our own Journal to show how that Act was interpreted at the time. "The provisions for preventing the improper use of poisonous substances will not be complete, notwithstanding the labours which the Legislature has devoted to the subject during this and previous sessions of Parliament, until some further arrangements and regulations have been made regarding dangerous medicines. Such regulations are contemplated in the Act which has just been passed, and they may be made from time to time by the Pharmaceutical Society, with the concurrence of the Privy Council. The subject is one of considerable importance, involving several points of detail, and it merits the serious attention, not only of pharmaceutists, but of members of every branch of the medical profession. Questions will naturally arise as to the best methods of arranging and labelling the bottles in which dangerous and other drugs are kept for use in dispensing, of distinguishing, when dispensed, such medicines as may be safely administered internally from those which are intended for external use, and of drawing attention to those medicines intended for internal administration which require great care or special precautions to be observed in using them." Then there are some other matters which I need not read. But then occurs this passage:—"Many of these regulations relate so exclusively to the internal arrangements of the shop or dispensary, that those only who have practical experience in dispensing can fully judge of the extent to which they are likely to realize the required object. Details of this description will therefore be most successfully devised and carried out by those who have the strongest and most direct interest in their operation." So far as to the way in which we interpreted the intention of the Act. Now let us see what the Legislature has thought and said upon that subject. I find that Mr. Lowe said when the Bill was about to be introduced into the House,—"The noble lord the Vice-President of the Committee of Council gave notice that he would move that the Bill should be referred to a Select Committee, but that notice has, I am sorry to see, been withdrawn, and some amendments have been put on the notice paper in substitution, but they do not seem to touch the main question, which is, whether powers of licensing persons to sell dangerous drugs shall be entrusted to persons who are in truth a mere voluntary association. I hope the Government will take care that an opportunity be given for discussing the principle of the Bill, and that the Bill be not allowed to pass through Committee between two and three in the morning without discussion. The Government ought to obtain some security from this voluntary association that the provisions of the Bill will be properly carried into effect." Again we find he says in reference to clause 1, "I move to leave out the words Pharmaceutical Society with the consent of;" the effect of that would be that it would have taken out of the hands of the Pharmaceutical Society any control, and would have vested the whole matter in the hands of the Privy Council. Mr. Headlam contended against that, and said, "The regulations as to the keeping and selling of poisons will be prescribed by the Pharmaceutical Society with the consent of the Privy Council. It seems perfectly clear that these two bodies, the Pharmaceutical Society, who will prepare these regulations which will relate to their own trading, and the Privy Council, will act together; for the latter will have to give their consent to the regulations. It cannot be objected that there ought to be some regulations relating to the sale of poisons; nor can it be objected, I think, that these regulations ought in the first instance to be framed by the Pharmaceutical Society." Mr. Headlam took charge of this Bill through the House, being in correspondence with our authorized representatives and negotiators, and he said, speaking in that capacity, "It cannot be objected there ought to be some regulations relating to the sale of poisons, or that the Pharmaceutical Society are the proper persons to frame them." I am trying to show the intention of Parliament with reference to this Bill which we accepted. Mr. Lowe further on says, "I think the clause as framed is nonsense. The idea is, that the persons referred to shall conform to certain regulations which, with the consent of the Privy Council, shall be prescribed by the Pharmaceutical Society, etc." So far as regards the House of Commons. Now in the House of Lords I find that Lord Redesdale was exceedingly pertinacious in an endeavour to introduce into the body of the Bill provisions as to the kind of bottles to be used in dispensing and sending out liniments, embrocations and poisons, which constitutes one of the provisions of these regulations. Lord Redesdale is chairman of committees in the House; he is a man of exceedingly great influence, and, at last, he very unwillingly yielded, upon the understanding that it would be done by the Pharmaceutical Society. But I want to read you the way in which his opposition was overcome by Lord Granville, who, also on behalf of the Society, was coaching the bill through the other House. He says,—"I think that the clause framed by the noble lord may be modified with advantage before it is submitted to the House. On this subject I have received a letter from a gentleman of much practical experience, and I will read it to the House. He says, 'I find that Lord Redesdale retains his faith in the poison-bottle, and intends to propose it again on the third reading of the Pharmacy Bill, adopting that which I certainly believe to be by far the most distinctive bottle ever used. But the more I consider his lordship's proposition, and the more I think of the value pertaining to special bottles of any shape when used according to the discretion of dispensers who understand their business, the more impressed I become with the impolicy of specific enactments concerning them. I have already told your lordship that most chemists in London use distinctive bottles for dangerous articles and external applications; they have done so for the last six or seven years, the practice gradually increasing. I have also said that the use of these bottles should be restricted to such articles. Now I presume the words "poison" and "poisonous" in the proposed clause must be construed according to clause 2. If so, we should be prohibited from using such bottles for every medicine not in the schedule; and I need scarcely say the schedule does not contain a sixth part of the dangerous preparations daily passing through our hands. I should not think now of selling laudanum in any other than a poison-bottle; laudanum is not in the schedule, consequently I must, if the amendment pass, discontinue that precaution. I know Lord Redesdale thinks it is the inconvenience of the compulsory enactment which actuates the Pharmaceutical Society in resisting his proposal, but I can assure you most honestly that they are anxious, both by example and recommendation, to promote his views, and really apprehensive that his amendment would prevent their doing so.'" The objection to that was, to a stiff, hard and fast rule for the adoption of a certain bottle at the will and pleasure of Parliament, without affording us an opportunity of considering how far it was applicable. I am not going to argue much in favour of the details of these regulations. What I want to contend for is, that we are under a bond of good faith to comply with the Act of Parliament, and pass such resolutions as we, with our knowledge of the business, know to be sufficient to carry out the intentions of Parliament and secure the public, whilst, at the same time, we do not impose any impediments to the carrying on of our business. I think I have shown it was the intention of Parliament to impose upon us the obligation to prescribe such regulations; that penalties were to be imposed on those who broke the regulations; and, if so, the language of the Act of Parliament would be perfect nonsense if they never were prescribed. I think I have shown you that that was so understood at the time throughout the country, and that it was so understood and accepted here as the signification of those clauses and the debates in Parliament. It is a question, therefore, as it seems to me, very much of good faith. As men of honour, as men of business, and as prudent men who are anxious to conserve that which we have been thirty years building up, the honour, the reputation and the influence of this Society, which has already checked much crude legislation that would have been of the greatest possible injury to us; in order that we may maintain that influence for the future as the protector of the trade, I say we must not now do that which would sacrifice our reputation, which would put us in the position of breakers of pledges, because I can conceive no consequences which would be more disastrous than the Nemesis which follows societies or individuals who do not keep good faith. I cannot see, Sir, how we, as men of honour, can depart from the negotiations which were conducted on our behalf by the Council and by those who more especially represented the Council. I do not see how we can repudiate the signification of that letter, which I take to be a guarantee that it would be safe to leave the carrying out of the intentions of Parliament to this Society. It is a very proud privilege, a great distinction, to have been associated with Parliament in making laws for our own government. As somebody has said, it is much better that we should have a hand in making our own laws, than that they should be framed by persons who do not understand our position. We have been told by our Council that they did give those pledges. It is evident that the Privy Council understood them to do so, and they now call upon us to fulfil our guarantees. But another thing is said, and that is, that if that pledge was given it was given in excess of authority. I profess to know something about Parliamentary business. There are few sessions in which I am not in Parliament, either promoting bills or opposing bills; and I confess that, I should be much astonished if those for whom I acted did not feel bound by pledges given in their behalf. Can a Society go up *en masse?* It is against the laws and liberties of England to do so. We are bound to depute our Council, and they depute their representatives; and what their representatives assent to, in obtaining privileges of great importance, is binding upon us. For goodness' sake do not let us begin, when we are thirty years old, to be breakers of pledges. I do not want to look at the consequences, for the fear of consequence is a low motive; but if it can be shown that we, with our eyes open, have undertaken this, then, I say, that whatever the consequences, *coûte que coûte*, let us carry out what we have undertaken to do. But I am content to rest upon consequences, and their advantageous or disadvantageous effect; and upon that point the only tangible thing I have heard is, that if we prescribe these regulations, it will inevitably lead to inspection, and all the inconveniences and annoyances which flow from it. I regard inspection as odious to Englishmen, and there is nothing on earth that I should be more anxious to contend for than my own independent action. But I have looked through this Act of Parliament, and I find that under it there *are no powers for inspection, and that it cannot be imposed upon us.* If we prescribe these regulations, I defy an inspector to come into my place, or I will guarantee to kick him out if he does. What are the provisions of clause 15 of the Act?—that whoever shall fail to conform with any regulation, and so on, "shall for every such offence be liable to pay a penalty," and so on. Let me ask how those penalties are to be recovered?—by the action of the Registrar only. But what are the consequences provided we do *not* pass these regulations? We exasperate the Privy Council. The Privy Council tell us in so many words that they will seek further legislation. It is no longer Mr. Lowe and Mr. Bruce: but the Chancellor of the Exchequer and the Home Secretary, who, throughout the passing of this Act, showed themselves most jealous of giving to a voluntary association any control. He was the man who said that Parliament ought to take security that we would fulfil our undertaking. But he said something more than that.

A Member: How long is he likely to be in office?

Mr. Giles: I do not care to attempt to answer that question. Mr. Lowe, with characteristic pertinacity, says, with reference to clause 2, "I shall move to leave out the words 'the Council of the Pharmaceutical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act.' The object I have is this:—It is desirable that the public shall know the number and names of the poisons against which regulations have been made. The Arsenic Act is published and put in force, and you will want somebody to prosecute under this Act, and certainly the Pharmaceutical Society will be a most unfit body. *The Act ought to be placed under the care of the police and* in the hands of a department of the Government, and certainly not left in the hands of those who will live by the sale of poisons; if that be so, the restrictions imposed will be of little value." The Home Secretary says, "I shall support the amendment, for I desire to enlarge the powers of the Privy Council, who have already a medical department. The clause as it stands will restrict the powers of the Privy Council, and I see no advantage in doing that." What have we to expect if we wilfully let pass this opportunity of settling this question in a rational manner? I say these regulations are such as ought, apart from law or anything else, to be adopted by every conscientious man, by every wise man, who wishes to lay his head on his pillow with a feeling of satisfaction and security. I say what is likely to be the consequence if we lose the present opportunity? Why, we are told that we shall have application for further legislation. That application will be made to persons who will feel their sagacity and foresight complimented by our breakdown, and will be exceedingly glad to impose the strictest regulations upon those whom they regard as a recalcitrant and obstinate body of men, and they will come down with all the force of that hostility which we are so anxious to avoid. Sir, I beg to move as an amendment to the resolution, "That, by virtue and in exercise of all powers and authorities granted under the provisions of the Pharmacy Act. 1868, in this behalf, the Pharmaceutical Society of Great Britain do hereby prescribe the following regulations for the keeping, dispensing and selling of poisons, and resolve that the same be submitted to her Majesty's Privy Council for their consent." (The Regulations proposed were the same as the Recommendations proposed by the Council for voluntary adoption: see p. 949.)

Mr. Baldock (Norwood) said: Mr. President and Gentlemen,—I have much pleasure in seconding the amendment. I shall not say much on the subject, because I feel quite certain, from the ability with which Mr. Giles has dealt with the question, I should be very little able to add anything which will influence the meeting in favour of the amendment, but I fully agree in what he has said. Those gentlemen, however, who intend to oppose this, or propose any further amendment, should not forget what took place in 1868 and the two previous years, when Pharmacy Bills were brought in by Sir Fitzroy Kelly and by Sir John Shelley. On those occasions, we lost our Bill because we met with factious opposition from without,—the parties I refer to being, then as now, unwilling to be led in any way by the Council of the Pharmaceutical Society, which has done so much for the whole body during the last thirty years. The Bill which we might have had on that occasion, if it had not been for the opposition, was, I think, far more suited to our requirements than what we got in the following year, and we nearly lost that because there were no poison regulations in it. When Parliament gave us that Act, it was with the express understanding that it was to contain poison clauses, and much delay was caused on this account. Numerous meetings of the Society and of the Council took place, and ultimately the Bill was passed in its present shape. Coming, then, to the recommendations which have been proposed to us, it certainly seems to me, as I said in the letter which appeared in last week's Journal, that all opposition to them ought now to cease. No doubt it would be very objectionable in some cases to keep drug bottles under lock and key,—in the wholesale trade, for instance; but when we are simply asked to make the poison vessel distinguishable by the sense of touch,—whether it be anything which shall prick our fingers, or a spring upon the lid, or any other means,—I think the remedy is in our own hands, and could be easily applied by every one. The only fault I find with the poison schedule is, that it is so limited in its character. The poisons in the schedule are very few, and the more numerous they are the better for us, because, although to a certain extent it will increase the difficulties with which we have to deal, it would, on the other hand, confine the sale of poisonous articles to qualified men instead of leaving it so largely, as at present, in the hands of persons who are now not legally responsible for their acts in the same degree. The only objection made against these provisions is that they do not apply to medical men; but what have we to do with legislating for medical men? They, like us, are under the authority of the Privy Council, and are subject to all sorts of pains and penalties if they neglect their duties. We certainly fight under their banner, for they are a superior body to us, and, do what we can, we are not able to coerce them in any way any more than they can coerce us. We complain very justly that many of them dispense their own medicines, but that is totally beside the question now before the meeting, and has nothing whatever to do with it. If they choose to dispense their own medicines, and make a mistake and poison any one, they are quite as amenable to the law as we are. The question has been asked whether, if we pass these resolutions, they will become compulsory; and, if compulsory, whether they will involve a system of inspection. I take it they will not, and in both cases cannot. For who is to inspect us? Certainly not the police, as Mr. Giles said; we want a more intelligent body than they are. I take it, it will depend upon whether any accident occurs. If we pass these regulations, and make them compulsory, and any accident happen, we shall be then asked, "Have you or have you not complied with these regulations?" And if you have, that will be a sufficient answer to the charge; but, if not, you will incur the penalties mentioned in the Bill. I have great pleasure in seconding Mr. Giles's amendment.

Mr. Vizer: May I be allowed to ask a question, because I think it is very important that the meeting should understand clearly the position in which we stand? I came here this morning with the full determination that, as far as I was concerned, this discussion should be conducted in as calm and quiet a spirit as possible; but I want clearly to understand the nature of the amendment which is before the meeting, because it seems to me that it is a repetition of the resolution which was moved from the chair, with the addition simply that it be made compulsory. If such be the case, I cannot understand that that is an amendment unless the amendment consist in the fact of the regulations being made compulsory, which, I think, is a question we have already settled. The Council has settled it.

A Member: It is this meeting that has to settle it.

Mr. Vizer: The views of the whole meeting and of the trade are, I believe, against compulsion. We are not come here to-day to put a collar round our necks which last year we very distinctly refused to wear. If I understand the amendment aright, and we are asked to pass a vote for compulsory regulations, I do not think we need discuss it long. I shall be glad if the Chairman will tell us whether we are to divide upon the question whether these regulations are to be compulsory or not.

The Chairman: As I take it, this is an amendment by Mr. Giles on the original motion of the Council. It is quite competent to Mr. Giles to propose such an amendment, and it is also quite competent for any other member to propose a further amendment after that. If this amendment of Mr. Giles should pass, there can be no doubt, I think, that the recommendations or regulations will then become compulsory.

Mr. Brown (Manchester): I rise to a point of order. I shall certainly maintain that the amendment of Mr. Giles is no amendment at all. I should like to have the opinion of our solicitor upon that point, and I am sorry he is not present at this moment in order to answer it. But I appeal to any gentleman who has had experience of public meetings whether this is an amendment. I maintain it is an original motion, of which notice ought to have been given, and it ought to have been proposed as a substantive motion, and seconded in due form. Then it would have been in order.

Mr. Abraham (Liverpool): I am satisfied, Sir, that the amendment which has been moved is perfectly in order. It is upon the main question whether these regulations should be compulsory or not. I beg to say that there is not a member of the Society who would have been more glad than myself to have adopted them as recommendations only, provided we could honourably do so: but I think it has been shown clearly by Mr. Giles's statement, to every man in this room, that as members of the Pharmaceutical Society, we are bound to pass these regulations. Not because we like them, by any means, but because the Legislature has imposed upon us the duty of making regulations. And I beg to say that although I seconded Mr. Dymond's motion to bring this matter before you in the way in which it has now been done by the Council, it was simply to enable you to do the next best thing to doing the right thing. I believe it is our duty to pass these regulations in the sense in which they were contemplated by Parliament; and although as a member of the Council I seconded the motion that they should be framed so as to enable you to pass them as recommendations only, as I think that would be better than rejecting them altogether, yet standing here as a member of the whole body, who only have the authority to make these regulations, subject to the confirmation of the Privy Council, I cannot but raise my voice in favour of the amendment which has been moved by Mr. Giles. And I must remind you that it was the opinion of a large majority of the Council that they ought to be passed in the sense in which they were originally proposed. The proceedings of the Council are not now known to you only from the statement of the President, or from the resolution which has been laid before you. The proceedings of the Council have been published from month to month in the Journal, and you know that the Council think you ought to pass these as regulations. It is only a small minority of the Council who hold a different opinion, and I believe most or all of them were not members of Council at the time the Act passed. It is only with them that there is any difference of opinion as to our duty in the matter; and although I desire to make these regulations as little burdensome as possible,—and I do not think they ought to be adopted if they are at all burdensome, or if it could be shown that there would be any difficulty in observing them in any shop in the kingdom,—to refuse to pass any regulations at all is distinctly to set aside the vote of Parliament, and is, I am assured, perilling the interests of the Society and of every member of the body.

Mr. Brown: The question before the meeting is not whether the regulations should be compulsory or not, but whether this meeting will adopt certain recommendations which are submitted by the Council.

Mr. Vizer: In support of what Mr. Brown has just said, I maintain that if an amendment of this nature be laid before the meeting, it is one of the most unheard-of and unprincipled acts which can be conceived. I repeat it. It is an unheard-of and unjust act. This meeting has been called together in the ordinary way as an annual meeting; the recommendations have been issued to every member with the one distinct idea that they were to be brought forward by the Council as recommendations only. And I beg leave to say that if that view of the case is altered, it is most dishonourable on the part of the Council. This meeting has been called to decide the question whether we shall receive these as recommendations, and hundreds of members have absented themselves from this meeting on the distinct understanding that they were to be put forward simply as recommendations. I do assert most emphatically that if an amendment of this nature is allowed, it is a most discreditable act. The Council, as a body, ought to protest against it. But I sincerely trust that the meeting will not be detained over the argument on compulsory regulations, but that a division will be speedily come to, and I am convinced that 90 out of 100 will vote against it. It is an unheard-of thing to waste our time discussing such a question, and the sooner we come to a vote upon it the better.

Mr. Urwick: I wish to make a few observations on these recommendations, but in the first place I do feel that we should be committing a most dishonourable act if we are parties to any vote which is to be compulsory, when the notice sent to the country members and distributed throughout the kingdom had only recognized these as recommendations. It would be taking an advantage of the country members to entertain such a question, and I therefore protest against the amendment, and call upon the Chairman to enter my protest.

Mr. Edward Burden: May I ask if the Chairman has ruled that the amendment is in order, or not?

The Chairman: Yes, I have ruled that the amendment is in order. It is competent for any member to move an amendment to any motion that may be brought forward.

Mr. Humpage: It appears to me that it is no use my coming here and arguing, if I have sent up my paper pledging myself to a certain course. I conceive that these papers have been sent up believing that such-and-such a course would be adopted, and that these rules would be passed as recommendations. But I also ought to be aware that if at this annual meeting the members present should think otherwise, and any gentleman should choose to make an amendment, and a different view is afterwards taken, when argument has been gone into, it is perfectly regular to vote for such an amendment. We surely cannot tell our friends in the country what will take place at a meeting like this. If they are so much interested in it, let them come up, and then they will be ready to vote; but if we can do nothing, what is the use of coming here and discussing the question.

Mr. Urwick: Can we make rules binding the body of members, the body not having notice of those rules?

Mr. Hampson (Manchester): If it is thought desirable to deceive and disgust the whole trade, now is the time, by means of this amendment. You want the outsiders to come in, and by the course of action now proposed you thrust them out. The amendment may be in perfect order—I do not pass any opinion upon that—but the consequences of the amendment, if carried, will be to sow a whirlwind in the country that you will not see the last of for some time. I have had some means of judging of the spirit of opposition to compulsory regulations, and I can assure you that if you wish to advance the interests of pharmacy, or even to advance the interests of this Society, you will not vote in favour of the amendment. This amendment will plainly show the outsiders, many of whom I conceive are quite equal in capacity to ourselves, what they may expect from the unscrupulous adherents of compulsion, and you will likewise arouse a spirit amongst them that will not easily be set at rest. You will shut the doors against them, and sow discord throughout the country. I should like to say a few words on the general question. The word "honour" has been put forward in this discussion, and freely reiterated, and we are told that if we do not vote in a particular way we shall be dishonoured. I maintain that nothing of the sort follows as a consequence; that if certain gentlemen who were in high office at the time had the power through their fortuitous position to carry the Pharmacy Act through Parliament, they did not ask the opinion of the country about it, and you must also remember that we are not only legislating for the few in this room,—because, properly speaking, it is legislation we are about,—not merely for pharmaceutical chemists, but for the entire trade throughout the country, numbering many thousands.

Mr. Mackay: I desire to say one or two words upon this point. I have been listening very calmly to what has been going on, and have heard the word "honour" used repeatedly, and perhaps advisedly; but that word may in certain circumstances have two meanings. I am not prepared to say that the amendment is illegal, or to protest against its introduction, but this I do say, and I say it most emphatically, it would have been a much fairer course for the gentleman who has so ably and eloquently pleaded for this amendment, if due notice had been given of it. I make this remark, and, in doing so, speak strongly for the following reasons:—I know, and believe many gentlemen present know, that deputations had been organized in different parts of the country—I can speak positively as to Glasgow and some other places; that these gentlemen had been prepared to come here and represent the chemists and druggists in various towns, had the compulsory question not been understood to be at end; and therefore most of those deputations which had been organized would have been in this room to-day to oppose this amendment. It is not for me to enunciate what my views are, but at a recent meeting of the Council I joined in the almost unanimous vote that a certain course of procedure should be adopted. That course resulted in the recommendations which are before us, and, having emanated from the Council, they have been circulated broadcast throughout Great Britain, and I say it is specially unfair, and I use the word with due consideration, to many country gentlemen who are as deeply interested in this question as we are, to push the question of this amendment to a vote. So strongly do I feel upon this point, that if the amendment is pressed I may move the adjournment of the meeting.

Mr. Waugh: There has been a great deal of talk about honour, and so on, but my experience is this, that a man who knows and feels what personal honour is, will be very careful how he casts reflections upon the honour of other men. It is a very delicate thing, and to all rightly-constituted minds that which every man most highly prizes. I am perhaps the oldest member of the Council here, and whatever may be the abstract merits of this question, I say, do not press that amendment. When I came here to-day, a bit of paper was put into my hands, bearing date May 4th, and I must say I felt this was a most unusual step, and it looked very much like attempting to steal a march upon us. How was it that, the Journal having been published twice since that date, the document was not published? How was it you never published that little private note from your friend, Mr. Simon? It is a close thing, gentlemen, and, in my opinion, not a fair thing at all. I must sit down, but I beg you not to press that amendment.

A Member: Will not Mr. Giles withdraw the amendment, and make us all a happy family?

Mr. Randall (Southampton): I would heartily join in what has just been said, and beg that at all events in the shape it has taken, this amendment may be withdrawn. Not because I object to the amendment in itself, for I should support it most heartily at the proper time, and as it regards mere technicality I think it certainly is an amendment, and a reasonable one: but why I think it ought not to be taken now is, that it is more than an amendment, not less. It proposes that the common seal of the Society should be put to certain regulations which will give them the power of an Act of Parliament; but I say that after what has taken place, supposing we do this to-day, the Privy Council will not admit that it has been properly done, and will send it back to us to do again; for I am quite satisfied that the Privy Council on looking into the matter, would say,—We are very glad indeed that these regulations have been carried, but they certainly must be carried at a meeting at which due notice of their being brought forward has been given. I do not think it was necessary to speak quite so strongly about honour, and so on; I think we shall be all agreed that we cannot take them as regulations to-day, but I do hope that if Mr. Giles should see it right to withdraw them as such, he may still give some of us an opportunity of showing that we do feel that in our corporate capacity we ought to act exactly in the same way as we should as individuals. I say that if the members of this Society individually had done what we have done, as Mr. Giles pointed out to us, we should not one of us have drawn back from taking upon ourselves the burden of these regulations; I do not think, as a corporate body, we have any right to do anything less. Therefore, although it would not be proper to pass these now, seeing that no notice has been given of them, I quite agree that we ought to pass them some day. Now, gentlemen, it is only fair to look at the course which has been taken. It was not the Pharmaceutical Society's Bill that introduced poison regulations, but for some reason which I shall not criticize, our Bill was upset once, and nearly upset again by attempts to put poison regulations in. Then the Pharmaceutical Society said, that being the case, supposing Parliament will give us a Bill, not just for the promotion of our own interests, but a Bill that shall promote, as they think, the interests of the public, whereby, at the same time, our interests will be promoted,—we will put in the next Bill some poison regulations. They insisted on having not only regulations for selling, but also for keeping poisons. The Society has done its best to obtain a Bill; and having in vain attempted to do without poison regulations, now, as men of honour, as we have had the regulations forced upon us, I think we ought to carry them out straightforwardly. That I believe to be our position, and I think that we ought to pass these recommendations now, and also to pass a resolution that we shall be quite ready to make them regulations if called upon to do so.

Mr. Clark (Leicester): Would you kindly state, Mr. Chairman, if in your opinion the passing of this resolution will give satisfaction to the Lords of the Privy Council? If you think it will, or if you think it will save us from obnoxious legislation, I should at once ask this meeting to pass it unanimously, and would urge upon Mr. Giles to withdraw his amendment, upon condition that Mr. Vizer adopts the same course in regard to his resolution. If this plan should be adopted, I have no doubt a favourable impression would be made upon the Privy Council, and would have much more weight than if carried by only a small majority.

The Chairman: I am not in a position to say that the Privy Council would be satisfied with the recommendations. I have had no communication myself personally with the Privy Council or its officers in any way whatever. The letter which has been alluded to came to the Secretary, and, as has been stated, that letter was laid before the Council. I felt that was no more than I could do in my position. Certainly it appears to me that any gentleman may make an amendment, and any gentleman may make a further amendment. I am desirous of doing that which the meeting approves of; and if the meeting particularly desires that Mr. Giles's amendment should be withdrawn, and if Mr. Giles is willing to withdraw it, I am willing it should be so. But I cannot order Mr. Giles to withdraw it; and if he insists upon it being put, I must put it.

Mr. Squire: From the general spirit of this discussion on both sides, it does appear to me that the Privy Council must gather, from what has been said, that the thing requires more ventilation. These regulations consist of three parts, either of which may be adopted by chemists; and it does appear to me that they are still imperfect. I think if a law was imposed which we have to follow, it should implicitly state one rule of action. Here are three, and they appear to me to be very difficult for people to adhere to strictly. I do not think in any Act of Parliament this sort of ambiguity would be allowed. When I was in the House of Commons about this Bill, Mr. Sandford said to me, "What do you think of that clause?" which I afterwards learnt was a pet clause of a gentleman connected with the Privy Council, and it was to this effect, that no poison should be sent out except in single doses, and that upon the order of a medical man. When you consider that a man may be ordered a composing dose to be taken every two or three hours during the night, I think it would be rather awkward to require a doctor's order for each dose to be obtained. That shows you what may be expected from the Privy Council, and that without our assistance they could not frame such regulations as should be practicable; and it is no use making an Act of Parliament unless it is so, for it would never be followed. Upon the whole, therefore, I think that the question is not yet matured. When I was here last time, as a member of the Council, I said the same, and I still think so. I think the spirit of these meetings shows that there is an inclination to obey any laws that the Council like to make; and I think the tendency is to make such regulations, if they can, as shall, in every way, satisfy the Privy Council also. We are not a rebellious body, but we do not think these are the things which should be made compulsory; therefore, I hope that another year, if we shall live so long, we shall have an amendment of this which will be more acceptable to the body at large.

Mr. Hills: I wish to say shortly why I have changed my opinion, not since I have been in this room, but during the various meetings which we have had at the Council. I believe with many gentlemen who have spoken here to-day, that we must some day or other have regulations, and that they must be enforced—regulations framed by the Pharmaceutical Society and approved by the Privy Council. I originally was in the majority, thinking these regulations ought to be passed, and hoped that they would be confirmed by the meeting here and afterwards go to the Privy Council. But I changed my mind, because there seemed to be so great an objection out-of-doors. I therefore thought it would be better to pass them as recommendations to be tried, feeling sure that if once tried they would be voluntarily adopted as regulations; they are now brought forward as recommendations, and I hope my friend Mr. Giles will withdraw his amendment. By doing so we shall become, as has been said, a happy family; and the trial of these recommendations of the Council for twelve months will so far convince us of their usefulness and practicability, that we shall adopt them as regulations at the next annual meeting.

Mr. Sandford: Gentlemen, I have often been received here with the same good-feeling which now greets me, and though I fear I shall differ from many of you to-day, still I hope we shall be as good friends as ever. I am sure, Mr. President, you will quite appreciate the difficulty under which I rise,—I, who have always held that the Council should stick together, and that if there is a majority on any one point, the minority should succumb. I, being in the minority, a minority of one single individual, must now rise to oppose a majority. But in doing so, I act, as I ever have done, in the interests of the Pharmaceutical Society, because I believe most certainly that the course proposed by Mr. Giles is that which will secure for the Society the position which it has held hitherto, and which is now imperilled by the action, or rather want of action, proposed. It has been asked whether the Privy Council will be satisfied with these things as recommendations. I have had no communication with the Privy Council since, I think, January last, when the regulations in form were agreed to and submitted to this Council, and afterwards accepted by it. But I am perfectly satisfied that they would not be taken as of any value whatever. I think we must all of us have observed, gentlemen, that of late years the tendency of the Government has been to act in departments, and that certain subjects have been handed over to different departments. All matters connected with the public health have been handed over to the Privy Council, and I do not know that we should find fault with that because we want to have the Government of the country carried on as efficiently as possible. Formerly such questions were everybody's business; you might go to the Home Office, or the Board of Trade, or any other office; but now they are concentrated in the Privy Council Office, and there is a medical officer there who is one of the most active servants of the Government. We know perfectly well what the feeling of that medical officer is from what our friend Mr. Squire says, of a notice I pointed out to him on the paper, as our Bill went through, that no poison should be sold to any person except in medicinal doses, without the order in writing of a legally-qualified medical practitioner. That is the sort of thing which we may expect from the Privy Council. I hold here in my hand all the Poison Bills which have ever been introduced, there are no less than eight; and there is another very important one which was never introduced to Parliament. And what do I find are the provisions in these Poison Bills? I find that in the first, which was proposed by Lord Granville—I may say our friend Lord Granville, because it was through him we obtained our Bill,—that no poison should be sold except to persons of full age, that they should not be sold without witnesses, that they should not be sold without the certificate of a medical man, or a clergyman, or a magistrate. I find that every poison is to be sent out in four-sided bottles, and that on each of those sides there should be the word "poison" impressed. I find that there were inspectors to be appointed. Now the less we say about inspectors the better; but I find, as I go on, that in one of these Bills the inspectors were to be constables. Lord Granville's Bill in May, 1857, was No. 1. It went on to Mr. Walpole, so both sides of the House were engaged in this matter. Mr. Walpole was in power in 1859, when he proposed his Bill, and he put in a provision that the constables were to visit and see that we complied with the regulations. At that time Jacob Bell was living, and under his guidance we opposed all these Bills, but we did so on one special principle, viz. that they did not provide for the qualification of the vendor. I take up these Bills to show you that they were fairly considered in this Council, that they were considered as things which would go on, and they were amended by the Council. This Bill which I hold in my hand is covered over with erasures and alterations and interlineations made by way of amendment by your Council. Therefore it is not a new subject with the Council at all. And what happened then? Last of all, Jacob Bell himself drew a Bill. We have been told over and over again that had Jacob Bell been living, we should never have been threatened with such a Bill as this; that he would have led the trade and resisted it. But what did he do? He drew a Bill in which he introduced as examiners of the Pharmaceutical Society a foreign body; and he not only did that, but he proposed this particular clause appointing inspectors, which I must read to you, although I do not like to publish it. This Bill was never in Parliament; it was prepared with the endorsement, that it was a Bill containing in substance "all that is valuable or likely to be practically useful to the public in the sale of poisons." This, remember, was a Poison Bill, not a Pharmacy Bill. It provided who should be allowed to sell poisons, and that all poisons should be distinctly labelled with their names and so on, and then I find this clause, to which I want to call your attention. "The President and Censors of the College of Physicians of London shall have full power from time to time, at reasonable times in the day, to enter and search any shop or place where any drugs or medicine, simple or compounded, are sold by retail, to ascertain that the provisions of this Act concerning the keeping of poisons and the labelling of the same are duly observed." That is the Bill which was prepared by Jacob Bell himself to be submitted to Parliament. I just wished to show you that, to show in what a different position we now are. We have now the opportunity of making regulations without any inspection whatever. We cannot have an inspector sent into our shops without a fresh Act of Parliament, and we have every reason to believe that the Privy Council would be satisfied with the regulations we have proposed, which might be easily carried out. As Mr. Squire said, you may take one course or you may take all three courses; with that elasticity we should not interfere in any way with the easy carrying on of business. Here we have an opportunity of doing this, and now we say, no, we will not do it. If ever inspectors are appointed, we shall have to thank those who have drawn attention to the subject by their opposition. We do not say the regulations are bad, but it is a sentimental grievance that we should have them at all, therefore we throw it up entirely, and let the Privy Council go to Parliament. You know quite well what Parliament will do. There is a sample of what they would have done in 1857 and in later years. And I think that is evidence enough to show what Parliament will do now; because remember that with an active medical officer on the Privy Council, he will urge on his representatives in the House of Commons and the House of Lords, and the Government will go to him for advice on all these questions. He has before him all the details of poisoning cases and all the accidents that happen in business, and you cannot say that these things are unnecessary. If you say so, the answer is, we are told that in the best houses they are all adopted, therefore, how can you call them unnecessary? I heard a gentleman say this morning that he was utterly astonished at the opposition to these regulations; that he knew some twenty shops in the country where no precautions were taken, and where all the poisons and other drugs were huddled together indiscriminately. Now, remember it is not when a man is going to use strychnine that he wants to be reminded that he has strychnine in his hands, it is when he is going to use some innocent medicine such as James's powder, and he by accident gets hold of the strychnine bottle, it is then he wants to be reminded by some simple means that he has not got James's powder in his hand. And you are not bound to use the same precaution with every poison. I may tie strychnine over with a leather cap and be more careful with it than with a morphia bottle. I say nothing now about the honour of the thing, because I consider that is perfectly established. Mr. Giles has most correctly stated the feeling and the understanding there was at the time of the passing of our Act. I have heard it objected that it was a tacit understanding. Sir, there must be tacit understanding when you are on business like this. Mr. Giles tells you what happens always in getting Bills through Parliament. I was to a great extent authorized to treat with the members of Parliament and with the Government in the proceedings with regard to this Bill, and I am perfectly satisfied that I did not in any way neglect the interests of the Society. If any man battled with the medical officer of the Privy Council, I did, and in all but one thing I beat him, that one thing I always felt ashamed of, it was that he succeeded in bringing in poppies; that one thing I could not get over. It was the last thing, and I think Lord Granville went into the House rather in a hurry, or that might have been excluded also. I mention that to show you that I have not been the obsequious servant of Mr. Simon. He would never propose anything to me which would be derogatory to this Society. Mr. Giles alluded to the debates which took place, and I will not go further into this point. I will pass that over and confine myself to the question of policy. I say it is policy for us to adopt these regulations in the form in which Mr. Giles proposes. Some people speak of breach of faith in proposing this amendment. I say it is no such thing. Last year it was proposed that these recommendations should be adopted for twelve months; they have been on their trial for twelve months and more. They were submitted to you last year, and you have all had an opportunity of trying them since, and there has not been a valid objection to one. But if there were, it is quite open for this meeting to amend them in detail. If you do not like tying over, use some other means, you can amend them in any manner you like in detail; but just admit the principle that we are a part of the Government, that we are pledged, and that it is not only that we are pledged, but that it is our interest to act in accord with the Government and not in antagonism. I do therefore most sincerely trust that you will vote for the amendment of Mr. Giles.

Mr. Wade: I think we may all take it for granted the Council are willing to adopt the views of the trade, and more especially of their own members. If such is the case, I would just take you back to the last annual meeting, when the resolution come to was, not that we did not require or would not take such regulations, but that which we distinctly stated, and which has since been endorsed, was, that these regulations that were put forward were not of a consistent character, and it was not desirable to have them compulsory. If such was the case, I would ask the Council whether they have learned from the trade during the past twelve months what is their opinion, and what is the opinion of their own members. I do not wish to mention intimidation, or to say a word about storms that may be created; but, having once expressed an opinion, I think, when that has been done in a calm and deliberate manner, the Council may be fully justified in altering the opinions they had formed, and studying the wants and desires of their constituents. I am not one to blame, but rather to honour and respect the course which has been taken by our late worthy President, and I shall, as long as I have the pleasure of knowing him, honour him for the course he has adopted. It is a great pleasure to me to acknowledge what he has done for the trade, although I have differed from him many times, but still it has always been my desire to hold him in high honour; and, although I differ from him now, still there is not an act which he ever committed which redounded more to his honour and credit than his resignation. Still, while I admit this, I must oppose Mr. Giles's amendment. At the same time, I cannot support the resolution of the Council. I say so for this reason. I consider it a most insidious amendment. I think it has been brought down after the sense of the whole trade and of all our members has been taken in every part of the country,—after that opinion has been expressed by deputation and memorial, and it has been virtually acknowledged. After that a letter comes to you on the 4th of May, which ought to have been published in the Journal. We ought to have been made acquainted with that, which may be called a threat, an intimidation sent from the Privy Council office. If there is anything dishonourable I consider it is Mr. Giles's amendment, because I do think that that which the Council have put forward was an act of honour. They attended to the wishes of their constituents; they saw that during the past year the trade had made up their minds upon the point, and, with commendable good sense, they attended to those wishes, and put forward these propositions in form of recommendations rather than regulations. I beg you not to go back from that course of action. If you do not wish to create distrust, but to make outsiders feel that this Society has but one interest, and that interest only the interest of its members, do not pass Mr. Giles's amendment. It comes in at the last hour when we are not prepared, the idea having gone abroad that we were not to have any opposition of this kind. The idea was, that we were to carry something which should meet the views of the Privy Council, and not be compulsory on ourselves. If the Council in their deliberations have come to the conclusion that these resolutions they have adopted are likely to be in accordance with the spirit of the Act, why do we hear so much about want of honour and breach of faith? Is it likely that your Council, composed of men of honour, would ever allow such resolutions as these to be put forward for your acceptance if they did not think they were carrying out the honour and spirit of the Act? Do you suppose they would allow their Solicitor to frame a resolution which would meet the wishes of the whole Society unless they felt they were carrying out honourably that which it was their duty to do? Therefore, upon every principle of honour, I think we ought to accept that which our Council have put forward rather than that insidious amendment of Mr. Giles. So much with regard to Mr. Giles; but with regard to the resolution of the Council, I must say I do not consider that these regulations have been sufficiently looked into since our last meeting. I consider they are almost equivalent to those which were then put forward. We then said we are prepared to accept certain recommendations, and if you will give us such recommendations not only which are beneficial to the public, but such as really can be carried out, that is what we want. We do not say we will not do it; we say, give us such regulations as we can practically and honourably carry out. Mr. Sandford has told us that in London every one adopts these resolutions. Of course they do, because there is no difficulty about it. But he says in the country you go into a shop, and find poisons of all kinds scattered about. Why is it? Because the characters of the business are so opposite, and what is easy in one place is difficult in another. Therefore we say that these resolutions are not practicable for the country. We say that in the great dispensing houses and others in cities, where you have nothing but small quantities to deal with, you may accept them, and think you are doing very right in carrying them out; but it is not so easy for our country friends; and therefore, unless you revise these resolutions,—and we asked you at the last meeting to take them back and revise them,—I do not think they are such as should meet with general acceptance. Let us have such a code of rules as can be carried out practically, and then we shall be ready to honourably fulfil our duties under the Act; we shall bring the whole trade into unity, and reflect credit on ourselves.

Mr. Sandford explained that the note from Mr. Simon had not been published earlier because, when a former one was published immediately on its receipt by the Secretary, a complaint was made that it ought not to have been done before it was laid before the Council.

Mr. Wade said he was glad to have that explanation, because the very fact of the former note having been published made him think it desirable that the one of May 4th should have made been known to the trade immediately.

Mr. Watts: Last year, during the noisy discussion which took place with regard to the Poison Bill, I made a remark to this effect, that we must not lose sight of this great fact, that if we did not make regulations for ourselves the Privy Council would make them for us, and that anything done on the part of the Government would be hardly so acceptable to the body generally as if it were done by ourselves. I think that same remark will apply on the present occasion. A great deal has been said about country members and outsiders, but my own opinion is that country members and outsiders know very little about the matter. What I mean is this, that there are a great many members in the country who desire to be led; and the proof of that is shown in what our friend Mr. Vizer has done, and he not only intends to lead the country members but the town members also, if possible. I must say I am rather surprised at the remark of Mr. Randall, that if these regulations were adopted the Privy Council would send them back and say they were irregular, or something to that effect. I conceive that Mr. Giles is in perfect order; and I am very much surprised that those who are in the habit of attending public meetings should express any opinion to the contrary. It is competent to any one to move an amendment, and I trust Mr. Giles will press his to a division.

Mr. Bell (Hull): The gentleman who has just sat down stated that Mr. Vizer was trying to lead the country members. This I consider a great slur upon those gentlemen, and I cannot submit to it. With regard to these regulations, we in Hull fully understood that they were withdrawn, and would come before us as recommendations only, otherwise I can assure you that two-thirds of the members of the Society in Hull would have been present here to oppose them.

Mr. Davison (Glasgow): I came here to represent Glasgow, and the feeling there is that the regulations would be presented to the meeting as recommendations simply. Since I came here I have seen this note of Mr. Simon's, but I am prepared to vote just the same. Mr. Simon speaks of the regulations being required for the safety of the public, but in Glasgow two-thirds of the dispensing is done by medical men who keep open shops. Some of them have three, and many have two; and I think if the Privy Council and Mr. Simon are going to legislate for the benefit of the public they ought to legislate for these surgeons. Not many weeks ago a man came into my shop, and asked for an ounce of tincture of cantharides, which I refused to supply him with unless he brought two witnesses with him, which he declined to do, but in the course of half an hour he came back again, and brought a bottle containing an ounce of tincture of cantharides without even a poison-label on it, which he had obtained at a surgeon's; and in many of these doctors' shops there is not a responsible person, but merely a girl or a boy sometimes to serve. I am quite prepared to attend before Mr. Simon any day to explain the matter.

Mr. R. O. Fitch (Hackney) said he had not intended to be present, as he understood the regulations had been withdrawn; but he had received a private intimation that it would be requisite for him to come. With regard to the Poison Bill, he could supplement what was said by the last speaker by parallel cases in London. It looked very well on paper to talk about the protection of the public, but there was a good deal of nonsense about it. Not long ago a Greenwich pensioner came into his shop, and asked if he wanted to buy any savin, as he had a large shrub of it for sale. On the other hand, a gentleman's coachman, who wanted some to give his horses at the spring of the year, came all the way from Acton to his shop at Hackney, where he had been accustomed to procure it, because the chemists at Acton would not supply him with it. If any regulations were required at all, he hoped they would include one that no person under sixteen should be served with any poison without written instructions, for mistakes were constantly happening with children.

Mr. Long: I must agree with Mr. Giles and Mr. Sandford, and all those gentlemen who have spoken on that side of the question. I think the opposition that we have is like the opposition which we get in every trade to everything in the nature of improvement. People talk about putting collars on their necks, and all that sort of thing; but, if they were to adopt every enlightened method of principle which was proposed, it would be much better for them. I cannot imagine men who, in such a dangerous business as ours, could be content to have these poisons strewn broadcast over their premises, to be taken hold of by anybody haphazard. The regulations are very good in themselves, and can easily be followed. Either of three principles which are laid down may be adopted; and the people in the country, of whom so much talk is made, if they have a cask of arsenic, can easily lock it up, and tie their other poison-bottles down with leather, or adopt some simple means of calling attention to them. I think, therefore, it is very absurd, and unnecessary, to object so to it. We shall have to have it, and therefore we may as well do it in our own way, as otherwise we shall have to accept regulations imposed upon us by Act of Parliament. If we were not to oppose so many difficulties, but to take advantage of every modern improvement,—like early closing, shutting up on Sundays, and so on,—we should be in a much better position than we are now. We have not any time to ourselves, not because we could not have it, but because we choose to impose this collar upon ourselves; and we allow the public to suppose that a chemist is at their beck and call any moment they like, instead of making them provide for their wants in our business the same as they would in any other case.

Mr. Dymond (Birmingham): I hope, Mr. Chairman, that whatever we do, we shall make up our minds to settle the matter now, without postponing it or adjourning the meeting. I have listened with the greatest interest to what has taken place, and the more I have listened the clearer has my mind come to the conclusion that the Council have done right in presenting the motion which they have. We have here opinions most ably stated by Mr. Giles, in which I may say I most cordially agree. We have other exactly opposite opinions, also ably stated by Mr. Vizer, and it seems to me that the recommendation of the Council exactly lies between them. If one side will give way a little, and the other will give way and meet at the point proposed by the Council, we may come to a unanimous conclusion. These recommendations I am sure, from my own experience of what has taken place in the Council, have been the result of long and anxious deliberation. We have, on the one hand, known all that Mr. Sandford has told us of what the Privy Council has done, of what has been attempted in previous Acts of Parliament, and indeed have become familiar with the whole history of the question, with opportunities which few others have possessed. Knowing this, a large majority of the Council felt that the regulations, in their compulsory form, were those which the country ought to accept. On the other hand, we have, since these first resolutions were arrived at, had manifestations of opinion throughout Great Britain, by means of meetings and memorials addressed to the Council, the meaning of which has been unmistakable, and which it would have been folly to ignore. The Council is but a representative body; it was bound to take notice of the opposition thus manifested, and it would not have been a fair representation of the opinion of our constituents to attempt to pass these resolutions compulsorily. We therefore went again into the matter with, speaking for myself, convictions still unshaken of the desirability of such regulations and of the obligations which the Society had incurred by the passing of the Pharmacy Act, but yet conscious that the chemists of the country were unprepared for such a measure. Convinced of that, I, as a member of the Council, say it was not our business to carry forward that measure in a compulsory form. Yielding to that which we see is the opinion of the trade, we have brought forward these measures in the form of recommendations; and I am convinced, in proposing that recommendatory form, we have done the only thing possible to do, and which I believe it is wise for this meeting to accept. I do ask you to settle the question now, by passing the moderate measure which we have proposed.

Mr. Linford: I perfectly agree with what Mr. Dymond has said, but what if the Privy Council will not accept that only as a recommendation? Are we any nearer to our end at all? Is it not possible that the only way in which it can be successfully presented would be that the recommendations should be adopted for a year on the distinct understanding that if they are found practicable, they, or some other recommendations which may be amendments of these, should be adopted as compulsory at the meeting this day twelvemonths. I think by that means we may arrive at a medium course, which may, to a certain extent, satisfy the Privy Council, and enable us to still hold in our own hands the regulations, which, if we once give them up to those who are not acquainted with the trade, will be imposed upon us in a very different shape. I have heard a great deal about objections to these regulations, but I myself have conducted business in the country and in London. I have dealt in paints, oils and colours, as well as drugs; and I have had the entire conduct of a large West-End business; but I have never yet heard any distinct and specific accusation against any one of the regulations as impossible to be carried out. I should like some country member to tell us what it is he cannot do. If he cannot lock up his cask, he can put some sandpaper on the lid, or put a rim of sandpaper round it; there are many things which will be strictly in conformity with these regulations, and which are perfectly easy of adoption. There is, perhaps, no business where it would be more difficult to carry them out than where I am at the present time, but I think even there I could manage to carry them out without any insuperable difficulty; and being able to carry them out without fear of inspection is an advantage which we ought not to lose sight of.

Mr. Squire: I think Mr. Linford's observation, if put in the form of an amendment, would be carried almost unanimously by the meeting,—that is, to adopt these regulations for a year.

Mr. Edwards: I will not go over the whole ground which has been gone over already to wearisomeness; but two things I will notice. We are charged with having unfairly published this letter, or rather with keeping it back as a threat. Now, when the first letter of Mr. Simon's came, it was published immediately; and we were charged with doing that which we had no business to do until the Council saw it. It was said that the Editor of the Journal had no business to publish that letter until it was laid before the Council; therefore, this letter was not published until the Council had seen it. One other remark I would make about the inspection. I shall not go at all deeply into that, except to state that the fear of inspection is a perfect fallacy in my mind, unless you refuse these regulations, and then, I believe, it looms in the distance, and is not very far off. But the Council have done what they could do. You know their opinion, and their opinion is unchanged still; but if you will not have these regulations, the Council have ceased to wish to force them upon you, and they throw the responsibility upon yourselves. But I, as a member of the Council, cannot help warning you that, if you wish for inspection with all your heart, you had better reject these resolutions. The Committee of the Privy Council, if they bring any bill into Parliament, will not omit inspection; and depend upon it you will have yourselves to thank for that which you might have avoided. We are not entitled to say that we know they are quite satisfied with them, but we have every reason to believe that, if you pass them, it is all they require. I remember a little time ago sitting at a board of health, and some Act of Parliament was mentioned. I said to the solicitor: "But supposing it is not done, how is it to be enforced?" "Enforced," said he, "like every other Act of Parliament. If a man breaks the law, and is found out, he will be punished." It was not that an inspector was needed. Where is there an inspector for gunpowder? Where is the inspector under the Arsenic Act? It rests on the same ground as every other law; if you do not obey it, you do it at your peril. You will find there is no inspection necessary; but I must tell you, whether you think it popular or unpopular, if you wish to have inspection, you cannot adopt a surer method to obtain it than by refusing to pass these resolutions.

Mr. Townsend: I think, with regard to the amendment of Mr. Giles, there is a very serious difficulty, from the fact of a circular having been sent to the whole trade which, by implication, led the country members to infer that the regulations would be adopted to-day as recommendations only. I think this difficulty might be solved, and the subject might be calmly considered, if some such resolution as this were passed, that in adopting the recommendations suggested by the Council, this Society is prepared to consider the desirability of confirming them as regulations at a future meeting.

Mr. Giles: I have been asked several times whether I will consent to withdraw my amendment. I shall be very willing to withdraw it on conditions. If I can be assured, to begin with, that by postponing action at the present time, we shall be secured against any action of an offensive nature in future. I regret exceedingly that it has been considered necessary—not by myself so much as by others with whom I have consulted—to mix up this question of compulsion and principle with these questions of detail. My last intention, after I had submitted the notice which I gave of this amendment, was to move a resolution to the effect that it is the duty of this meeting to comply with the provisions of the Pharmacy Act, by prescribing certain regulations, leaving altogether out of the question the nature of these special regulations, in order that they might be made the subject of further deliberation amongst gentlemen appointed by this meeting to confer with the Council. But I am satisfied it is no use to delay. We have delayed for twelve months, and I do not think we have fulfilled the kind of engagement we gave when we then postponed it. I do not think the chemists throughout the kingdom have given these regulations a trial. I would only just say one word more in justification of a slight imputation on my personal honour in bringing this matter forward at the last hour. To begin with, notice was given by Mr. Baldock of such a resolution in the Journal; and, in the second place, I have an abhorrence of anything like a packed meeting. I determined to bring this forward to such a meeting as happened to come, and I assure you, on my honour, I have not asked a single person to attend it. Granted the opportunity of packing the meeting, no matter what the question is, I will undertake to carry it, but do not let any one have the chance of packing it.

Mr. Urwick: I think Mr. Giles ought not to go into the question again. If there has been any question asked which he wishes to answer, and the meeting wishes to hear him, it might be allowed; but we ought not to go into a discussion again.

Mr. Edwards: Mr. Giles has an undoubted right to reply.

Mr. Giles: I understand that I am replying by the courtesy of the meeting. I assume I have cleared myself from the charge of bringing this forward in any dishonourable way. The question is, shall I withdraw this amendment? I am willing to meet any compromise which will not put us in the position of leaving this room to-day with the effect that we have passed over this opportunity, and have declined to do that which I hold to be our duty, to form regulations in accordance with the provisions of the Act of Parliament. If any gentleman can suggest any method, by which that can be done, I am willing to agree to it; but if it comes to this, that we withdraw this resolution, and let the thing go on as a denial of the obligation to impose some poison regulations, I do hold that it is of all things necessary that we should endeavour, at all events, to keep open a channel of communication between ourselves and the Privy Council. There, I think, is the fatal mistake made by our Council. I think you should have said we are bringing forward a thing which may not be agreeable to you, but still, as the representative organization of this Society, we think it our duty to keep faith. If we do not succeed in carrying this thing through, and we come into collision with Parliament, we shall at all events be clean-handed in the matter, and can go forward afterwards and make the best terms we can. That is of the greatest possible importance, and I do implore you not to be led aside. A gentleman near me said he did not think this question was understood in the country; and he is so far right, that it requires a great deal of reading up back evidence, in order to be quite in possession of the actual facts of the case. Do consider the question calmly, gentlemen, and not be rashly hurried into a decision which will land us in an unfortunate position, which we may hereafter have to regret. If any gentleman is prepared with a resolution which will have the effect of a compromise, I shall be glad to withdraw; but if not, I must still insist upon my amendment, in order to get a definite expression of the opinion of the meeting.

Mr. Vizer: If Mr. Giles will accede to the amendment which I was going to move, it will solve the difficulty.

Mr. Giles: I do not know what your amendment is.

The Chairman: I will read it. This is the amendment suggested by Mr. Vizer, "That whilst desirous of taking every reasonable means for the protection of the public, this meeting considers the recommendations of the Council unsatisfactory, and therefore refers the question for reconsideration to the new Council."

Mr. Stacey: I am very glad, Mr. Chairman, to notice from what has been said, the implicit confidence which the country members evidently have in the Council in London. They say that so fully was it understood that the Council were going to bring forward these recommendations, that hundreds of members felt there was no need for them to attend. I am glad to see that there is such confidence in the Council; but I will call their attention to one fact, that having that confidence and the Council having given most unusual exertions to this matter, they must remember that the Council have expressed their full confidence in the views of Mr. Giles and Mr. Sandford. Almost every one, certainly every one that has spoken has done so. Now the difference in the whole discussion lies between those two words "recommendations" and "regulations." The views are the same in every other respect. I have been attending to this discussion with very great care, and I wish further to call attention to one very important principle that was a little interfered with in one part of the discussion, namely, that this meeting is not a corporate body, that is to say, it is not a complete representation of the Pharmaceutical Society of Great Britain. Now if you once allow that principle to creep in, we get into very dangerous considerations with respect to previous meetings. You must take this meeting as a meeting of the Society, and its actions as such; and I would ask this meeting to consider whether they cannot accept these regulations as the express act of the Council, and not merely take them as recommendations, which will place this Society in very great difficulties with the Government. To say nothing else, it will place them in great difficulty with the Privy Council, and they are already in a sufficiently difficult position. Our position will be rather anomalous, seeing that as a voluntary Society we have to carry out an Act of Parliament which refers to the whole body of chemists in the country. Therefore, I think the Council may ask the support of the meeting, and I hope the meeting will give them that support in passing these as regulations.

The Chairman: I will now, gentlemen, put the amendment, but you must bear with me one moment, whilst I say that if anything has been done which has proved not quite so open as you might have expected, it has been simply an error in judgment, not from any desire to mislead. But when I see an amendment in print which was intended to be brought forward without having been made known to the Council or the Society at large, I cannot see how you could complain of another gentleman bringing forward an amendment which had not been in print. I simply say that, because some of our friends have used the word "honour" once or twice, and I think we ought to do, not only that which is honorable, but if possible something more. The letter from the Privy Council has been in the hands of every member of the Council for some days, and, therefore, it was quite competent for those gentlemen who reside in the country, and who felt so strongly that their friends would be kept away from this annual meeting, on the supposition that the resolutions would be passed as recommendations, to have informed their constituents that they had received such a letter, and that possibly something more than was anticipated might be brought forward. I need not again read Mr. Giles's amendment; but I will ask Mr. Giles and Mr. Vizer to be tellers on one side, and Mr. Baldock and Mr. Betty on the other.

The meeting then divided, and upon Mr. Vizer being requested to announce the numbers, he reported that there were 104 against the amendment, 85 for it.

The CHAIRMAN then declared the amendment lost by 19 votes.

The CHAIRMAN being about to put the original resolution—

Mr. VIZER said: I now beg leave to move my amendment, Sir. I will not detain the meeting long, because I hope they will agree to it. The amendment is as follows:—"That whilst desirous of taking every reasonable means for the protection of the public, this meeting considers the recommendations of the Council unsatisfactory, and therefore refers the question for reconsideration to the new Council." I hope the meeting will clearly understand that we do not by this amendment turn aside the idea of the need of recommendations. We, on the contrary, acknowledge and receive that fact as an axiom of pharmacy, but at the same time we hold that these recommendations which are now put forth by the Council are capable of material improvement; and on that ground we think this meeting should return them. But, further, these recommendations are virtually the same as those put forward last year. I have this morning carefully compared them, and can see no difference whatever in them, with the exception of a word or two here and there, and the transposition of clauses in second division, the spirit and essence being essentially the same. We believe that if the Council, instead of returning on our hands the same regulations which we last year so unmistakably declared to be unsatisfactory, were to take them back, and invite help from gentlemen outside to a general committee appointed to reconsider the whole question, a far better code of recommendations might then be issued. I think, therefore, that if the Council would now take them back, and in twelve months' time submit them again for our acceptance at the next annual meeting (so far as I can learn the feelings of those gentlemen with whom I have been in contact), the meeting would not then object to adopt a really good code of regulations. It is, therefore, in my opinion, most desirable that these should be reconsidered, and that we should have a more thoroughly digested code. I want it to be clearly understood that we do not object to recommendations, but we do say that these are crude and unsatisfactory.

Mr. HAMPSON: I will not detain the meeting, but I simply second the resolution.

Mr. URWICK: I beg leave to support the amendment, and for one reason I may say, that at the very beginning of the recommendations we find the word "selling;" but the Act itself has provided for the selling of poisons, and there is nothing said in the following clauses about it; therefore, that word is uncalled for, and shows the necessity for revision. When I commenced business some years ago, I adopted a poison cupboard, and every precaution which I could in dispensing; but there are still things here which, I think, may be changed, so as to place the dispenser, and one who has to deal with drugs, in a more comfortable position than these regulations would entail. For instance, we are told all poisons; but it did not say that this refers to the schedule of the Act. Seeing the meeting is impatient, I will only make an observation on the words "not to be taken internally." In the case of an acid lotion being sent out, the words "not" or "internally" may become obliterated, and the words "to be taken" or "to be taken internally" remain on the bottle; I therefore suggest the words "for outward" or "external" use would be better.

Mr. SANDFORD asked whether Mr. Vizer meant recommendations or compulsory regulations.

Mr. VIZER: Certainly not compulsory regulations,—recommendations only.

The CHAIRMAN then put the amendment, which, upon a show of hands, he declared lost.

Mr. LINFORD: I have already given notice of one amendment which I proposed to move, which was simply to the effect that we adopt these recommendations for a year, with a distinct understanding that the Council will propose these, or some amended form, in which the regulations may become compulsory at the next general meeting.

Mr. GILES: I second Mr. Linford's amendment.

The CHAIRMAN said this was not an amendment, but would come as a substantive resolution.

The original resolution as moved by the President and seconded by Mr. Bourdas was then put and carried.

The SECRETARY said that Mr. Linford was preparing a resolution which he intended to submit; but, in the meantime, he should like to secure a sufficient number of gentlemen willing to act as scrutineers, and the following gentlemen were nominated:—

Messrs. Andrews, Baldock, Constance, Froom, Hopkin, Horncastle, Humpage, Kettle, Moss, Palmer, Pound, Robbins, Vizer and Young.

Mr. E. BURDEN asked what was the meaning of two items in the invested property of the Society, one of which was denominated Hills' Prize Fund (£200), and the other the Secretary's Casual Relief Fund (£105). Did that mean relief given occasionally to the Secretary?

The CHAIRMAN said that Mr. Hills, who was always very desirous to assist in promoting the education of young men, had established a prize of books to be distributed every month to those who passed the best Minor examination. It was not necessary to say how that fund was established, but Mr. Hills himself had found the largest portion of the money, the remainder being derived from the sale of the portrait of the late Mr. Jacob Bell. With respect to the Secretary's Casual Fund, it arose in this way. Upon one occasion an honorarium of £100 was given to the Secretary for his extraordinary services in connection with the passing of the Pharmacy Bill, which he invested at once, in order that he might have a sum of money to apply to in the case of persons who asked for casual relief, not being eligible for the Benevolent Fund.

Mr. E. BURDEN said he was very glad to hear this explanation, and he begged leave to propose a vote of thanks to both those gentlemen.

The motion, being seconded, was carried with acclamation.

Mr. HILLS said he was very glad the Society had been pleased to accept his small donation, the object being to assist those who passed the Minor examination with books to prepare them for the Major one. As a young man he had felt the want of books himself, and, therefore, he thought it desirable to help those who might be in the same position.

The SECRETARY said, whoever happened to fill his office after him would always find a great many calls for casual relief; and, therefore, if any gentleman liked to add to the fund he should be very happy to receive such donations.

Mr. LINFORD: Mr. Chairman, I shall be as brief as possible in proposing this resolution, and my object in doing so is, that the Society may not land themselves in a hole. The Privy Council will not accept simply recommendations as a reason for staying other proceedings, and, therefore, I have framed the resolution in such terms as to acknowledge our liability at all events. I therefore propose, "That this Meeting is of opinion that it is the duty of the Pharmaceutical Society to propose at an early opportunity regulations for the keeping, dispensing and sale of poisons, in accordance with the provisions of the Pharmacy Act, 1868.

Mr. GILES: I beg leave to second that resolution.

Mr. REYNOLDS (Leeds): After the most impressive way in which Mr. Mackay has spoken of the duty of this meeting towards those members who are absent to-day upon the faith of an understanding, and his illustration of the intended deputation from Glasgow, I feel it difficult to add anything upon the point. Mr. Randall has represented the same view from the south of England; and it is my duty, on behalf of my fellow-members in Leeds, to protest against the principle of compulsion being voted in their absence, which is due to their faith in the late vote of the Council. If a matter has undergone free discussion, and it is put to the vote, after every member has had the privilege of expressing his opinion, I will bow to the opinion of the majority as readily as any man, but I am quite sure that what has been said by the Council, the acceptation of the resolution already passed by it, with only one dissentient, and the statement by the Journal that this question was practically settled, have induced gentlemen to stay away; and after the resolution which has been passed, I can see no reason why we should commit ourselves for the future, as this resolution would do. If notice is given I do not object to any motion whatever, only let us act fairly towards those who are not here. I will add one word as to the recommendations themselves. I believe the great mischief in connection with them as they now stand is that they adopt the poison schedule A, which was drawn up for a totally different purpose, and, I think, we should start on a simpler basis.

Mr. GILES: I rise to second the resolution, because I believe it has not yet been done. And I must protest at people coming here and saying that because their friends are not here, it is not competent for the meeting to transact the ordinary business of the Society. Such a thing I never heard of in all my life, and I have been a good deal accustomed to public meetings. I never did hear such a ridiculous proposition as that. If that were the principle to be acted on, why should we come here at all? why not transact our business through the post by means of postal cards? We are met here to discuss anything and everything connected with the business of the Society which may have arisen during the year, and if the Council, or governing body, choose to bring forward any subject, that subject being on the *tapis* is sufficient to justify anybody in bringing forward his own views upon it, and carrying them if he can. Do not, then, let us make such children of ourselves as to talk such stuff as that. I am ashamed of being a member of a meeting which fills this room, and to hear it seriously argued that we are not competent to deal with any question that is brought before us. This resolution is not the same as the one which was proposed before, but it is one which has my assent and approval, rather more even than the amendment I myself moved, because it leaves entirely open what the nature of the regulations shall be, and contemplates their being thoroughly ventilated, and that if thought desirable, as has been suggested, you may call in the assistance of persons from without. Persons may be appointed at this meeting, or there is no reason why any person should not write to the Council; in fact, I do not know that the Council have not already been inundated with suggestions. Some persons say that these suggestions are not satisfactory, but no one has said why, except one gentleman who said so under a mistake. And although we have heard, over and over again, that many firms adopt superior precautions to those recommended here, I defy anybody to indicate a possible precaution which is not contained within the four corners of this paper. I admit the elasticity of that paper. Our excellent and generally sagacious friend, Mr. Squire, rather complained of their not being sufficiently matured, and wanted a hard-and-fast system of regulations. But that is exactly the thing we do not want. We want something that shall comprehend everything necessary, and not bind us to anything in particular. I do think, therefore that we are justified in passing this resolution, and that it is not pressing the old question in a new form. The old question was whether we should, on this present occasion, prescribe for ourselves certain specific regulations, and now the new question is, that this Society should acknowledge the duty which lies upon it of prescribing regulations at a convenient time. Those are totally distinct things. If not, gentlemen, I am a donkey, and do not understand the English language. That is my misfortune, and I am very sorry it should be inflicted on the meeting. I do think we ought now to give a distinct indication to the Privy Council that we are not going to evade the obligations which they think lie upon us. If, on the other hand, we do mean to evade them let us say so in downright terms, so that there may be no mistake about it.

Mr. RANDALL (Southampton): In the first place, Mr. Chairman, let me say that I do not bring to this meeting any authority, save and except such as I bring in my own person, and I do not pretend to represent anybody. We have had no meetings, but I believe, as far as I know, the majority of those near me would be quite satisfied to have compulsory regulations passed. I think so, but I am not quite sure. In the next place, I look at this resolution as a perfectly different matter from the former one. I feel that it would be dishonourable in us to do anything to bind the Society to-day, after it has been understood that no such thing would be brought forward. If the first resolution had passed, it would have bound the whole body, but this will simply bind the present meeting.

Mr. EDWARD BURDEN: We have committed ourselves to certain recommendations which are to be forwarded to the Privy Council. I was going to ask, suppose the Privy Council set their seal to them, and render them compulsory. How should we be placed then?

Mr. SQUIRE: I think the Council are placed in this position. They will have to give some answer to the Privy Council, but we do not commit ourselves under this resolution to do anything immediately, but simply that regulations should be made for the storing, keeping and dispensing poisons, according to the provisions of the Act; and we on the Council may frame, with the advice of others, such regulations as should not be so obnoxious as these, and present them to the Privy Council. It simply says, we do propose to make some regulations. We are not compelled to make them as stringent as these, and I do not, therefore, see any reason why the meeting should not adopt Mr. Linford's resolution. There is nothing in it which commits us to any particular line,—it only says the regulations are to be framed; and surely it is not such a very hard case to frame such as should be satisfactory to the Society by another year.

The CHAIRMAN: This motion says nothing about time, and therefore I apprehend it really implies that we are to set to work at once. I cannot say how soon we may be called upon.

Mr. SCHACHT: It strikes me that there is a very important principle involved in this resolution. We have voted once, I thought, on the principle,—we have argued on the principle; and now this is a modification of the old principle again. It says this meeting is of opinion that it is the duty of the Council to do so-and-so; but it was upon that very consideration, whether it was a duty or not, that I went into one lobby instead of the other. I am of opinion that there is no obligation on the Pharmaceutical Society to do anything of the kind. I am quite aware that there is an awkward legal phrase in the Pharmacy Act, which may be interpreted in two ways. There is a word there written "may," which some individuals choose to read "shall." In my opinion the latter reading is incorrect; and on that interpretation I held my objection to the original proposition of the Council last year, and, consequently, I approve of what they have done in the interval, in changing their regulations into recommendations. We are now told that if these recommendations do not satisfy the Privy Council, we shall have some dreadful system of inspection forced upon us in exchange, and we are taunted with the fact that it will serve us right. I disbelieve it altogether. My opinion is that any application to Parliament for compulsory powers, such as would be imperatively necessary in order to make any such regulations compulsory and effectual, would be met with such a storm of opposition from all sections of the medical and pharmaceutical bodies, that it would have to be withdrawn; that, in fact, it would receive precisely the same treatment with which the recent attempt in Parliament was received to place the regulations of railways under the inspection of the Board of Trade. I dare say gentlemen will remember that only a few weeks ago an attempt was made to introduce a system of regulation and management of railways, but it was rejected almost tumultuously; and the grounds upon which one member of the Government opposed it were precisely the same as those upon which, as I understand, the chemists and druggists of England rest their objections to these compulsory regulations, viz. that in the first place it would involve the recognition of something like a handing over of a portion of the responsibility which each individual feels he is under if left to himself; and, on the other hand, that in order to make it in the smallest degree efficient you must have a system of inspection. "However good the regulations may be," said Mr. Chichester Fortescue, "it is no good pressing them upon the railway interest, unless you establish a system of inspection to see they are carried out." And precisely the same here. The sole legal power to enforce these regulations, should they become law, rests with Mr. Bremridge. There is no one else who has power to prosecute any individual who infringes that Act. Upon Mr. Bremridge alone rests the responsibility of doing so, and I ask what can he do? He can do simply nothing. I may obey the regulations, and my next-door neighbour may leave them alone. Not a creature will know anything about it, and unless he poisons some one, every one may do precisely as he likes. Then, what is the use of them? A law already exists which deals with any one who commits an offence. If any one by mistake, accident or default poisons another he is amenable to the law, and has to pay a heavy penalty. This Bill makes it possible that he may have to pay an additional £5 fine, after, perhaps, having to pay £2000 as compensation. What is the good of that? Simply nothing at all. If these things mean anything, they mean that care should be taken that men exercise those precautions which should prevent accidents; and, in order that they may answer their purpose, there must be a system of inspection. That I rebel against vehemently and strongly. I would not allow the smallest end of the wedge to intrude itself between me and the conduct of my own business. I should not vote for any regulations at all, for it seems to me that they would become merely a dead letter. I believe we are not necessarily compelled as a body to frame these regulations at all. I am aware that that is a moot question; but I never held the opinion that it was obligatory. It is a matter referred to the future, evidently for consultation by the members of the Pharmaceutical Society, and if the Society, in its entire and corporate capacity, chooses to determine that compulsory regulations are unwise, there is no obligation in that Bill to make it a point of honour in the smallest degree to introduce them.

Mr. M. Carteighe: Gentlemen, I hope you will support this resolution. There is one question raised now by Mr. Schacht on which I cannot remain silent. He says he believes that if such regulations as are contemplated were ever brought before the Legislature, they would be scouted and laughed at. Let me tell him that in the lobby of the House of Commons four members of the Parliamentary Committee of this Society watched every stage of the Bill, and every alteration suggested by the medical officer of the Privy Council; that they were in telegraphic communication with every local secretary throughout the country; that Mr. Brady, Mr. Reynolds, and many others were working with all their might to get members up; but in the face of all that we could not, on a vital principle of the Bill, get forty members in the House when there was a division. In fact, the Council resisted every alteration as much as they possibly could, and endeavoured to do without these regulations, but it was simply a question of a bargain: we were told, either you must have these regulations, or you shall not have a monopoly without. You may not think it was a right thing to do; it may have been a wrong thing, but the Act is now law, and it would be found very difficult to *undo* the law. If you pass this resolution, you may save the Council from immediate action on the part of the Privy Council, and I do adjure you, therefore, to pass it. As Mr. Randall has told you, it does not impose any regulations; it simply asserts a principle, and therefore many who could not vote for Mr. Giles's amendment can go with us on this point. By so doing, I am sure you will save the Council from considerable difficulty. Where will you find men who would have done more for you with the Privy Council than they have? It was said that these regulations were not what was required, and that they ought to be referred back again to the new Council. Why the same thing was done last year; and Mr. Vizer and his friends did all they could to send new men to the Council, and from that very new Council we get recommendations practically the same as we had last year.

Mr. Vizer: I had nothing whatever to do with influencing the elections last year.

Mr. Carteighe: I only go by what you said last year. You said send fresh men to the Council—I am speaking from memory—and these fresh members have brought before us to-day in substance the same recommendations as were brought forward last year. It is really a question of your power of resisting the Government. If you are sure that you can resist a Government measure if it is introduced, then do nothing; because recommendations are utterly worthless to the Privy Council. Once admit the principle that you ought to do this, and they will, I think, give you time to consider what regulations you will adopt, and to make them as lenient as you think desirable. But do acknowledge the principle, or else say deliberately that you reject it. If you do so by so narrow a majority as you have had to-day, you may guess what will happen if any unfortunate chemist should happen by accident to poison a bishop. Contemplate the smallest thing of the kind occurring, and what will be the result, with the energy which the medical officer of the Privy Council possesses. You all know what immense power he has, and that he is not a man to be balked. I do not sympathize with the regulations, I only look at it as a matter of policy, of prudence and of wisdom. Where do you find pharmacy without restrictions, that is, on a professional basis? Go to the United States; you find restrictions there. Go anywhere on the Continent, and you find restrictions on the sale of poisons much greater than these would be. You cannot blow hot and cold. You cannot be both free-traders and monopolizers.

A Member: We are not monopolists.

Mr. Carteighe: You have a monopoly of examination. I do not say we should not have secured it unrestricted if we could, but we tried and failed. As for the notion that the words do not mean it, all I can say is, as a member of the Council at the time and as a member of the Committee—and there are several other members here who, I think, will agree with me—that was not only the distinct understanding, but the understanding in writing, and the clause was drawn up in concert with the Medical Officer of the Privy Council. We tell you that, and you say it does not bind you, but that I cannot agree to. You lost a great deal by not passing this last year. At that time, as Mr. Schacht has said, regulations might have become a dead letter; in fact, he has told you how excellent they would be for practically carrying *nothing* out, and he astonishes me by not having voted for Mr. Giles's amendment. It appears that he is really waiting for inspection, and giving the notion of its necessity to the Government for the time being. And really the discussion in the Journal keeps the idea in the minds of the Government and of the medical officer, who no doubt reads our Journal regularly. You may depend upon it if he thinks the public will not be sufficiently protected without inspection he will ask for it. As Mr. Randall has very fairly expressed it, there may be differences of opinion whether these are the best possible regulations, but we are now simply enunciating the principle that at some time or other we will impose regulations of some kind. If we do not, I am sure the Council will be in a great difficulty, and I fear you will not get men on the Council who will be willing to give up the necessary time to fight the Government on a question of this sort when it may arise.

Mr. Wade: I desire to move an amendment in order to test this question, and it is to this effect,—"That this meeting having already expressed its opinion on the question of poison regulations, desires to leave it in the hands of the Council to deal with as they shall see fit." I move this because I apprehend that the Council, both the outgoing and incoming Council, will be perfectly competent to know what to do as to carrying out the provisions of the Act. It will be for the incoming Council, taking the wishes of the meeting as expressed to-day, to carry out these recommendations as they may see fit. I think, therefore, that such a resolution as Mr. Linford's is altogether superfluous and unnecessary.

Mr. Vizer: I beg to second the amendment of Mr. Wade. Mr. Carteighe says he does not blow hot and cold. This powerfully illustrates the evil of the continued absence of reporters from our Council meetings. If those proceedings were reported, we should really know what was done by the Council, which now we know nothing about further than on which side each gentleman votes. I do sincerely hope that the new Council will take this matter into their early consideration. One word about the amendment. Mr. Carteighe says we are not able to balk Mr. Simon; my opinion happens to be just the reverse: I think if that gentleman were to bring forward an Act of Parliament for compelling us to accede to compulsory regulations, he would not be able to carry it without including also medical men, surgeons, dispensers at hospitals and everybody else connected with the dispensing of medicines. I have far too high an opinion of the character of our Legislature to believe that the British House of Parliament would pass any Act to bind a fractional part of a large and intelligent body of men, leaving the greater majority unshackled with any restriction whatever. I think in that way we may fairly meet Mr. Simon. If he wishes to make the regulations compulsory let him go to Parliament to do so, and then we shall have to fight the battle out. The motion is in my opinion merely an attempt by a side wind to catch a few votes on the principle of Mr. Giles's amendment, which has been already lost.

Mr. Squire: I think the amendment is a very judicious one. Let us leave the matter in the hands of the Council, and see what course of action they take.

Mr. Sandford: I feel perfectly convinced that you will not satisfy the Privy Council in this way; and when I think how much more power Mr. Simon has now than he had in 1868, I do implore you to vote for the resolution.

Mr. Abraham: You may remit it to the Council, but they have no power to do anything. Nothing but this meeting can exercise the legal authority of the Pharmaceutical Society, unless you choose to adjourn it or call a special meeting.

Mr. E. Burden: I do hope the Council will have the wisdom to leave the question where it is and do no more. I hear the words Privy Council, Government, Parliament, used by one and another, and at the same time we are told that these recommendations are not going before the Privy Council at all. I believe if they are submitted to the Privy Council or the Government, the question will be directly asked, how do you propose to enforce them? and they will require some system of inspection or some other regulations which may prove obnoxious. Under these circumstances I should be for leaving the matter where it is, and let it rest until the Government raises the question. Mr. Giles has remarked that no one had brought forward any objection to these regulations, but the fact is he gave us no opportunity for doing so, by shutting us up to the question of compulsion or not. Otherwise I should have been prepared to propose the omission of No. 2 altogether.

The amendment was then put by the Chairman and declared to be carried on a show of hands. It was then put as a substantive motion and carried.

Mr. Urwick proposed a vote of thanks to the President for his able conduct in the chair, which was carried unanimously, and the meeting was then adjourned until Friday the 19th instant at eleven o'clock.

ADJOURNED MEETING,

Friday, May 19th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their report as follows:—

SCRUTINEERS' REPORT.

We, the undersigned Scrutineers, appointed at the Thirtieth Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting-papers committed to us and report the following:—

Voting-papers received		1478
Disallowed as follows:—		
Informal (having more than 14 names left)	13	
Received by the Secretary, per post, after the 15th inst.	124	
Enclosed in envelopes not signed by Voters	14	
Sent direct to the Secretary	3	
		154
		1324

Hills . . .	1218	Shaw . . .	769
Haselden . .	1200	Sandford . .	722
Mackay . .	1188		
Williams . .	1123	Owen . . .	719
Carr . . .	1087	Dymond . .	678
Atherton . .	1042	Abraham . .	621
Woolley . .	1041	Cooper . .	343
Greenish . .	992	Yarde . . .	334
Brown . . .	972	Collins . .	273
Betty . . .	869	Wade . . .	269
Smith . . .	850	Stott . . .	238
Frazer . . .	828		

BENJAMIN HUMPAGE, *Chairman.*

FREDERICK ANDREWS, JOHN MOSS,
JOHN H. BALDOCK, ROBERT PALMER,
EDWARD CONSTANCE, MATTHEW POUND,
WM. HENRY FROOM, JOHN ROBBINS,
WM. KING HOPKIN, EDWIN B. VIZER,
JOHN HORNCASTLE, ROBT. FISHER YOUNG.
JOSEPH KETTLE,

May 18th, 1871.

The Chairman then declared the Council and Auditors for the ensuing twelve months to consist of the following Members:—

COUNCIL.

ATHERTON, JOHN HENRY, Long Row, Nottingham.
BETTY, SAMUEL CHAPMAN, 6, Park Street, Camden Town, London.
BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
BROWN, WILLIAM SCOTT, 113, Market Street, Manchester.
CARR, JOHN, 171, High Holborn, London.
EDWARDS, GEORGE, Dartford.
FRAZER, DANIEL, 113, Buchanan Street, Glasgow.
GREENISH, THOMAS, 20, New Street, Dorset Square, London.
GROVES, THOMAS BENNETT, Weymouth.
HASELDEN, ADOLPHUS FREDERICK, 18, Conduit Street, Regent Street, London.
HILLS, THOMAS HYDE, 338, Oxford Street, London.
MACKAY, JOHN, 119, George Street, Edinburgh.
REYNOLDS, RICHARD, 13, Briggate, Leeds.
SANDFORD, GEORGE WEBB, 47, Piccadilly, London.
SAVAGE, WILLIAM DAWSON, 30, Upper Bedford Street, Brighton.
SHAW, JOHN, 24, Great George Place, Liverpool.
SMITH, EDWARD, 8, The Strand, Torquay.
STODDART, WILLIAM WALTER, 9, North Street, Bristol.
SUTTON, FRANCIS, 9, Bank Plain, Norwich.
WILLIAMS, JOHN, 5, New Cavendish Street, London.
WOOLLEY, GEORGE STEPHEN, 69, Market Street, Manchester.

AUDITORS.

BARRON, FREDERICK, 2, Bush Lane, London.
BOWER, WILLIAM, 96, Tottenham Court Road, London.
HODGKINSON, WILLIAM, 127, Aldersgate Street, London.
MACKEY, JOHN BRUNT, 2, Bouverie Street, London.
SQUIRE, WILLIAM, 5, Coleman Street, London.

The Scrutineers also handed to the President their report of the returns for the election of Local Secretaries.

Votes of thanks were given to the Scrutineers and the Chairman, and the meeting separated.

Correspondence.

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

THE BENEVOLENT FUND.

Sir,—As one of the Local Secretaries, whose conduct Mr. Vizer seemed by implication to censure, I should like to ask that gentleman on what authority he made the statement on Wednesday last, that there were at least 1050 errors in the country Register.

I feel sure he cannot find any in this district; and I question the extent of his allegation in others. I can easily understand that in London 150 errors may creep in, because there are difficulties in obtaining information which do not exist in the country. Here, those on the Register often inquire of me the position of others in respect to it. Besides this I am periodically stirred up to make the necessary inquiries by a circular from our active Registrar.

Ipswich, May 20th, 1871. J. WIGGIN.

Sir,—In looking over the list of subscribers to the Benevolent Fund, I was struck with the poor figure the wholesale houses cut in the list. I should have thought gentlemen making their thousands a year could have at least subscribed their ten guineas yearly. The mistake has doubtless arisen more from want of thought than want of heart; I hope next year will see an amendment. Some, I am sorry to say, are conspicuous by their absence.

Many of us are very poor, but there is not one of us, even if it cost a day's fast, who could not subscribe at least a shilling a year. Out of 10,000 chemists you have, at a rough calculation, not above a thousand subscribers. I would suggest that the 9000 should be canvassed for at least a shilling subscription, and as much more as they are able to give. I would suggest, moreover, that the publication of the names should not be compulsory, as many men do not like to confess they are poor. The Secretary of the Fund should appoint a chemist in every parish in London, and in every town and village in the country, with authority to make the collection. He should have a printed card given him, and the necessary safeguards taken against peculation.

A hundred years hence, it is possible, a Benevolent Fund, through better social arrangements, will be almost superfluous, but till that "good time" arrives each must give his mite.

May 16th, 1871. "LEFT HAND."

THE RECOMMENDATIONS FOR THE KEEPING, DISPENSING AND SELLING OF POISONS.

Sir,—I should be obliged by your allowing me space in the Journal for the following statement, which I intended to have laid before the Meeting on the 17th, but into which, owing to the length to which the discussion had already extended when I rose to move my amendment, I abstained from going, as also many other arguments, with which I was prepared to prove the unsatisfactory nature of the "recommendations" submitted to the trade for adoption; but this statement is such conclusive evidence of the absence of any grounds calling for compulsory enforcement of regulations, that I hope you will excuse my troubling you with it.

Having carefully gone through the Pharmaceutical Journals of the last ten years, the following is the summary of deaths from accidental poisoning as reported therein:—

Errors in dispensing by chemists	5
" " surgeons	6
Errors in retail	7
Errors by nurses, etc., mistaking bottles	3

Omitting those by surgeons, the total deaths per annum would be one and a half.

When we take into consideration the tens of thousands of prescriptions annually dispensed, and the innumerable sales of poisons, would any regulations, however carefully they might be framed, and however stringently enforced, apart from absolute perfection, reduce this infinitesimally small percentage? Could any Government with reason go to Parliament for power to bind a large and intelligent body of men upon such grounds? EDWIN B. VIZER.

63, *Lupus Street, Belgravia South, S.W.*

Sir,—In the course of the discussion upon the poison regulations, I have been somewhat amused to find that many members of the Council, through the opposition manifested throughout the country, have withdrawn their support from Mr. Sandford, although their opinions still agreed with his. Now, I maintain that when we members vote for gentlemen to represent us upon the Council, we expect them, after proper consideration, to vote always in the way they themselves shall at the time being judge to be for the best interests of the Pharmaceutical Society, quite irrespective of the opinions of those outside or around them. Were our representatives to do this, we should always respect them, if we could not agree with them. I think Mr. Sandford alone in this affair has acted altogether consistently. The actions of some of the others would almost indicate their wish for office (did I not know the honourable character of those I am alluding to). I can only suppose, therefore, that they have been influenced by the idea that their duty is to carry out the wishes of the majority of those who send them there instead of being free to exercise their own judgment.

May 20th, 1871. M. P. S.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. F. Vincer, Mr. R. Sheppard, Mr. J. Wiggin, Mr. J. Schweitzer, Mr. J. H. Gostling, Mr. S. Maskery, Mr. Paton, Mr. W. W. Jones, Mr. Harry Leach, Mr. J. W. Williams, Mr. J. R. Jackson, the Secretary of the Liverpool Chemists' Association, the Secretary of the Norwich Chemists' Assistants' Association, M. P. S., R. G. H., X. Y. Z., J. H., T. H., H. B., "Lover of Truth," "Capsicum," "Henricus," "A Country Chemist," "Give and Take," "Obrera," "Quæro," "Aquila."

In consequence of the great pressure upon our space caused by the report of the proceedings at the Annual Meeting, we are compelled to defer the publication of several communications.

CHLORAL HYDRATE.

BY DR. F. VERSMANN.

Some time ago I proposed sulphuric acid for testing chloral hydrate, and I now wish to give the numerical results of a few comparative experiments made with sulphuric acid and ammonia. The objections to the last reagent are twofold, the results obtained are not very accurate and the analysis requires longer time than is desirable.

In my previous paper I have drawn attention to the fact that the solubility of chloroform in water is the true cause of the inaccuracy, and not the further decomposition of chloroform by ammonia, and I arrived at the result in the following manner. In testing chloral hydrate I always take 10 grammes instead of the large quantity hitherto proposed. 10 grammes, if pure, should yield 4·82 c. c. of chloroform. I therefore placed 5 c. c. of chloroform in a long and narrow well-stoppered tube, graduated in 0·1 c. c., and after having added some water and briskly shaking the tube, I heated it in like manner as in the analysis of the hydrate and allowed it to stand for twelve hours. The loss was exactly 0·2 c. c. with repeated experiments; and as exactly the same loss was found in experiments with strong ammonia, it is evident not only that it is owing to the solubility of chloroform in water, but also that it must be taken into account in testing the hydrate. It is a constant loss, and whenever the ammonia test should be preferred, 0·2 c. c. must be added to the quantity of chloroform actually observed. I have adopted this plan, which I may call the ammonia test corrected. The results thus corrected correspond exactly with the sulphuric acid test, but I still prefer the latter, because the decomposition of the hydrate into chloral and water is completed in a few minutes.

I have described the *modus operandi* before and I therefore need not repeat it, but I will at once give the results of a few experiments made with samples from different manufacturers. The specific gravity of chloroform has been taken by Mr. Umney and others at 1497. I think this is too high; I prefer to take it as 1490 at 15·5 C. (60° F.). The specific gravity of pure chloral I take as 1505 at the same temperature.

AMMONIA TEST.
Ten Grammes of Chloral Hydrate.

Cubic centim. of Chloroform.		Percentage of Chloroform.	Percentage of Hydrate.
Observed.	Corrected.		
4·20	4·40	65·56	90·80
4·40	4·60	68·54	94·93
4·45	4·65	69·28	95·95
4·50	4·70	70·03	96·99

SULPHURIC ACID TEST.
Ten Grammes of Chloral Hydrate.

C. c. of Chloral.	Percentage of Chloral.	Percentage of Chloral Hydrate.
5·40	81·27	91·18
5·65	85·03	95·40
5·70	85·78	96·24
5·75	86·54	97·09

THE OCHRO AND THE MUSK MALLOW.

BY JOHN R. JACKSON, A.L.S.,

Curator of Museums, Royal Gardens, Kew.

Perhaps there is no one family of plants having so many species, with such a decided characteristic property running through the whole, as the *Malvaceæ*. Almost all are mucilaginous, and though none of them are now officinal in this country, the marsh mallow (*Althæa officinalis*, L.) and the common mallow (*Malva sylvestris*, L.) are sometimes used by the peasantry in rural districts, a decoction of the leaves of the first being applied for fomentations, and the mucilage with which both this and the common mallow abound being employed as a soothing or softening drink in coughs and bronchial affections. It is, however, chiefly in France that the roots are used to produce a demulcent drink known there as Guimauve.

In tropical or temperate regions, where the species of this Order are found most abundantly, the mucilage and seeds of the several species are used by the natives for various medicinal purposes. Two of the most interesting plants are the ochro (*Hibiscus esculentus*, L.) and the musk mallow (*H. Abelmoschus*, L.), the first interesting on account of its esculent and medicinal properties and uses, and the second principally on account of its seeds being used, to a certain extent, as a substitute for animal musk.

The Ochro, or edible hibiscus, is an annual herbaceous plant, with hairy stems and alternate cordate leaves strongly toothed, and from three to five-lobed. The petals are pale yellow, with a deep crimson base. The capsules or fruits appear to vary much in size according to the country where they are produced. Those we have seen from the East Indies are usually from four to six inches in length and about one inch in diameter at the base, tapering upwards to the apex, while those grown in Venezuela and some other parts of South America, as well as those from South Africa, are not more than two or two and a half inches long and one and a half inches diameter across the centre. They are marked with from five to eight ridges, running longitudinally from the base upwards and corresponding with the number of cells, each ridge forming a valve and partially dehiscing when the fruit is ripe and dry; the small round seeds also becoming loose and shaking in the capsule like a rattle. The plant is a native of the West Indies, but is cultivated extensively in all tropical countries, as well as in the south of France, principally for the sake of its fruit. This is gathered before it is fully ripe and is used as a vegetable, but chiefly for imparting a mucilaginous thickening to soups; it is also used when very young for pickling, like capers. The plant is officinal in India, being considered a valuable emollient and demulcent; the capsules are employed in a decoction, and the Indian Pharmacopœia gives the following instructions for its preparation:—

"Take of the fresh immature capsules, sliced transversely, three ounces; water, a pint and a half. Boil to a pint and strain; sweeten to taste.

"Dose.—From three to six ounces, or *ad libitum*, as an ordinary drink."

The inhalation of the vapour of the hot decoction has been found very serviceable in allaying cough, hoarseness, irritation of the glottis and other affections of the throat and fauces. The dried capsules may be employed when they are not procurable in a fresh state.

According to the testimony of Dr. Gibson and others, the fresh capsules bruised form an efficient emollient poultice.

The seeds are used in native practice in the preparation of a demulcent drink, corresponding to our use of barley, and the leaves are used for poultices.

The musk mallow (*H. Abelmoschus*, L. = *Abelmoschus moschatus*, Mœnch) is also an annual herbaceous plant with irregularly-toothed hastate leaves. The flowers, like those of the former species, are yellow with a crimson base, and are succeeded by an oblong-lanceolate hairy capsule. The plant is a native of the East Indies, but has become naturalized in the West, and is also cultivated in most tropical countries.

Both in the East and West Indies the bruised seeds are used internally and externally as a supposed remedy for snake-bites; they have a very strong musky odour, and possess cordial and stomachic properties, and the Arabs mix them with their coffee to give it a perfume. They are also used by perfumers in this country, chiefly, we believe, in the form of powder for sachets, being imported from the West Indies for this purpose.

Both of the above-named plants abound in a strong silky fibre.

ORIENTAL SPICES.

BY JAMES PATON,

Assistant-Keeper in the Museum of Science and Art, Edinburgh.

(*Continued from page* 923.)

International commerce in the earlier ages of the world was very different in all its relations and surroundings from the conditions under which the trafficking of the world is conducted. Commercial treaties are modern, and free trade is yet only an idea; geographical knowledge was cultivated among the ancients only to the extent of knowing the strength and weakness of neighbouring estates; a foreigner all over the world was a natural enemy, a highway through the nations there was therefore none, and he was indeed a brave man who trusted himself to the sea in the frail vessels which, creeping along the coasts, courted destruction at the first blast of a summer gale:—

> "Ille robur et æs triplex,
> Circa pectus erat, qui fragilem truci
> Commisit pelago ratem."

In these circumstances each people had to find within its own borders the necessities of life; to bring them from abroad was out of the question, and when home supplies became insufficient the people had to spread themselves outward over unoccupied lands. International commerce consisted in passing onward from State to State a very few of the rarest luxuries and indispensable medicines, which the very wealthy and most civilized demanded; and these in their progress through each nation were made a source of revenue to the communities that commanded the route. Thus spices and odorous gums, the rich products of the Eastern tropics, of which no single grain has ever been raised on the less genial shores of Europe, along with precious stones and pearls, from the earliest ages, formed the sole basis of the commerce of the West with the East.

The earliest glimpse we have of the spice trade gives us a most characteristic and vivid impress of the traffic of the early world. As the sons of Jacob had just completed the execution of their plot against their envied brother Joseph, on the horizon appeared "a company of Ishmaelites from Gilead, bearing spicery, balm, and myrrh, going to carry it down to Egypt." Thus 1700 years before the Christian era we find the Arabs possessed of the spice-trade, which their country, as a principal *entrepôt*, continued to hold down to the sixteenth century, when the whole system was overthrown by the discovery of the Cape passage. At this period Egypt was the capital of civilization, learning and luxury; and myrrh, cassia and other odoriferous substances, we are informed by Herodotus, were used for embalming the dead and in religious ceremonies.

The southern portion of Arabia, called Sabæa or Sheba, was peculiarly well situated for commanding the great trade in spices (hence the name Arabia Felix or Araby the Blest), lying in the direct route from the east to the west, commanding the great caravan route by the valley of the Euphrates to the shores of the Mediterranean, and just opposite the Regio Cinnamomifera or Aromata, the north-east promontory of Africa, from which, and not from India, the main supply of the spices then used was drawn. The Sabeans had the necessary skill and enterprise for conducting this trade, and cunning did not fail them. They overclouded the mysteries of the prized commodities with fables, such as that cinnamon was gathered from the nests of the phœnix, which bird procured it in some miraculous way; that it was found in the land of the birth of Bacchus, in marshes guarded by winged serpents; that terrible bats flew at the eyes of those engaged in gathering cassia, and other such tales, all of which we presume served to keep up both the interest in and price of these spices, and to deter the much believing inhabitants of the early world from prosecuting such dangerous enterprises on their own account.

The wealth and glory of Arabia Felix, acquired through this spice trade, was the wonder of ancient times, and the writers revel in descriptions of the grandeur of its cities, and the magnificence of its merchants' houses. Vessels of silver and gold, pillars of houses of pure silver, furniture inlaid and overlaid with pure silver, gold and precious stones are spoken of as common furnishings in the houses of the merchants; and our own Milton, in imaging the gorgeous state of the prince of the power of darkness, uses the comparison:—

> "High on a throne of royal state which far
> Outshone the wealth of Ormuz or of Ind."

Further, the fame of spices from Araby, and the poetical fallacy of winds laden with the spicy odours he alludes to in one of his magnificent images—

> "North-west winds blow
> Sabean odours from the spicy shores
> Of Araby the blest."

Civilization and the trade in spices, from the earliest ages of which we have any records, marched steadily from East to West, hand in hand, till in the end of the fifteenth century, having reached the great ocean, this very spice trade carried civilization across this mighty obstacle, and added a new and hitherto unknown world to the dominions of culture. Sidon, and afterwards Tyre, the mighty cities of the Phœnicians, situated on the east of Palestine, first commanded the waters of the Mediterranean, and by the way of the Persian Gulf and the valley of the Euphrates received the spiceries of the East, in which they traded with Egypt and the western countries.

Alexander the Great, on his triumphal return from his conquering march over Asia, brought back with him to Europe the first knowledge and use of common pepper. His contemporary, Theophrastus, in his 'History of Plants,' thus describes it: "Pepper, indeed, is a fruit, and there are two kinds of it; the one is round, like a vetch, having a husk, and rather red in colour, but the other is oblong, black, and full of seeds, like poppy seeds. Both kinds are heating, on which account they are used as remedies for, and antidotes against poisoning." Thus apparently both common pepper and capsicums were known as pepper from the earliest times.

Arabia Felix, being out of the line of Alexander's progress through Asia, he left in the quiet possession of its most lucrative trade; but in founding the city of Alexandria, he established what was, to some extent, a rival to the commercial cities of South Arabia, and an additional link in the long chain that stretched from the gates of Rome away into the absolutely unknown East.

In a work entitled the 'Periplus of the Erythrean Sea,' written in the early years of the Christian era, most minute details regarding the commerce of that period are given. As showing the estimation in which spices were held in Rome, about the time the Apostle Paul lay there a prisoner, and when Rome was in its zenith of wealth, luxury and dissipation, we may quote the prices paid for spiceries:—

	£.	s.	d.	
Cinnamon (then chiefly brought from the Regio Cinnamomifera or the modern Guardafui) .	*0	17	3	per lb.
Cinnamon Oil	60	0	0	,,
Black Pepper	0	3	3	,,
White ,, ...	0	5	9	,,
Long ,, ...	0	12	2	,,
Cardamoms	0	9	8	,,
Ginger	0	4	9	,,

It is remarkable that in this list neither nutmegs nor cloves, two of the most esteemed luxuries of later times, appear. These the Romans had not for another 100 years; it is not till about A.D. 160 that they are first spoken of. On two or three of the most insignificant islands in the Indian Archipelago, heaved up, and still constantly tossed by violent volcanic energy, these precious trees had hitherto grown and flourished unheeded by the inoffensive savages that peopled the isles. It had been well for the innocent people had they rooted out and cast into the sea the last stump of these trees, for they brought on their heads unspeakable sufferings, and on the Western nations a load of crime and cruel infamy unparalleled among the cruel deeds of mankind.

Growing upon these very remote islands, and not at all cared for by any inhabitants of the Archipelago, it is not to be wondered that these most delicate substances were so late in being discovered, when intercommunication was limited and perilous, and among people of sluggish and unadventurous habits. The discovery of the virtues of nutmegs and cloves is presumed to have been accomplished by the Telingas of the east or Coromandel coast of India about the time of Christ, when by religious persecution they were driven in large numbers to the islands of the Archipelago. In connection with this, Mr. John Crawford, in his 'History of the Indian Archipelago,' remarks, "It is a curious and interesting fact that every important change in the mode of conducting the commerce of India has been the result of, or has followed a religious revolution or convulsion. The trade of the Hindoos extended in no direction but towards Arabia until a religious schism propelled their enterprise to the hitherto unknown countries which yielded spices. The Arabian traders went no further east than the coast of Malabar, until they acquired enthusiasm and energy from the religion of Mahomed, when they crossed the Bay of Bengal, colonized in the India islands, and pushed their commerce and their settlements to China. Even the last great revolution in the commerce of the East, effected by the European race, is distinctly connected with the great changes in religious, as well as other opinions which characterized the commencement of the sixteenth century."

(To be continued.)

* These figures, of course, represent very much less value at the present day.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, B.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

HYDRARGYRI OXIDUM RUBRUM.

Some mercury is divided into two equal portions; one is dissolved in nitric acid, and the solution evaporated to dryness.

$$3Hg+8HNO_3=3[Hg2NO_3]+2NO+4H_2O.$$

The other is then triturated with the dry residue, and the whole heated till black, and nitrous vapours cease to be evolved; on cooling it becomes red.

$$Hg2NO_3 + Hg = 2HgO + 2NO + O_2.$$

The official product is an orange-red powder. The scaly variety commonly seen is made by heating the crystallized nitrate. They are identical in composition and properties, but the yellow oxide precipitated in the Lotio Hydr. Flava, or by adding potash or soda to solution of mercuric chloride is a distinct variety which possesses decidedly greater chemical activity. Red oxide of mercury is sufficiently soluble in water to give an alkaline reaction with litmus paper. [§ Entirely volatilized by a heat under redness, being at the same time decomposed into mercury and oxygen. If this be done in a test-tube, no orange vapours are perceived.] Complete volatilization ensures freedom from such things as brick-dust, red lead, etc. which would be left behind. The presence of undecomposed nitrate, a most dangerous contamination, would be shown by the production of orange nitrous vapours.

Red oxide of mercury dissolves in hydrochloric acid, forming the perchloride.

Unguentum Hydr. Oxidi Rubri is frequently apt to become slate-coloured. This arises from a reduction or deoxidation of the red oxide with formation of the black mercurous oxide. This is not so liable to occur when, as in the present Pharmacopœia, *yellow* wax is employed. In the last edition the ointment was prepared from *white* wax, prepared lard and almond oil. So made, it rapidly becomes grey, and, if a careless operator has used unwashed lard, it even becomes white from the reaction of the salt upon the mercuric oxide to form corrosive sublimate.

Hydrargyri Perchloridum.

A mixture of mercuric sulphate, common salt and a little black oxide of manganese is heated in a dry flask, or any suitable subliming apparatus. The perchloride condenses in distinct brilliant prismatic crystals or in masses. The change which occurs is a double decomposition.

$$HgSO_4 + 2NaCl = HgCl_2 + Na_2SO_4.$$

But since the sulphate of mercury is apt sometimes to contain small quantities of mercurous sulphate, which by reacting upon the salt would give rise to calomel, the oxide of manganese is added to prevent this.

[§ Perchloride of mercury is more soluble in alcohol, and still more so in ether than in water.] When dissolved in much water and exposed to light, a partial decomposition of the salt ensues, and a little calomel is deposited. In the Liquor Hydrarg. Bichlor. B. P., a small quantity of sal-ammoniac is added, with the view of preventing this change by forming with the perchloride a more stable double salt.

The aqueous solution is acid to test-paper.

[§ Its aqueous solution gives a yellow precipitate with caustic potash (HgO), a white precipitate ($HgNH_2Cl$) with ammonia, and a curdy white precipitate ($AgCl$) with nitrate of silver. When heated it sublimes without decomposing or leaving any residue.]

Specific gravity of vapour

$$\frac{200 + 2(35\cdot5)}{2} \times \cdot0693 = 9\cdot39.$$

The antidote to corrosive sublimate is albumen, which combines with it to form an insoluble compound. The white of egg should be given in moderate quantities, or the insoluble compound is redissolved.

ECONOMIC ENTOMOLOGY.

In the collection of economic entomology exhibited at South Kensington Museum, the life history of the insects is given, not only by specimens showing them in their various stages of development, but also by exhibiting specimens of the material subject to attack, with the insect belonging to it fixed in the natural position, as observed either when carrying on its work or undergoing its transformations.

Thus, in the case of our timber beetles, specimens are given showing the injured wood with the beetles at work on it as when alive, and in the case of some of our insects which carry on their work or transformations in the earth, specimens are given of the earth structures, so preserved as to present them, if not in their full freshness, at least sufficiently clearly for purposes of instruction.

For the method of preparation of the earth-cells we may take those of the *Balaninus glandium* as an example. The cells should be laid on a smooth surface, such as wood or china, and a rather thin solution of gum arabic, carefully dropped from a camel's-hair pencil, on all the parts that can be reached, and the moisture allowed to soak in; the drops of gum-water may be gently drawn in any direction required with the point of the brush, but the earth should not on any account be touched with the brush during the process, or it will be reduced to mud, and the characteristic markings destroyed. When dry the specimen should be turned, and the gum-water applied as before to the parts previously untouched, and the process repeated till the specimen is firmly set. If the operation has been carefully performed, the glaze on the surface will give little more than the appearance of wet earth; but if this is objectionable a little dry earth of the same kind, powdered over the surface whilst still damp, will restore the natural appearance.

Such specimens as ants' nests may be preserved by taking up a section of a few inches in thickness very carefully with a sharp spade, or, better still, with a long kitchen-knife, and laying it at once on a board, with the face, afterwards to be exhibited, downwards; and, having trimmed the specimen neatly, so as to be square at the sides, enclosing it in a strong cardboard or thin wooden frame (like a box without top or bottom), filling in what is then the upper side with very liquid plaster of Paris up to the edge of the enclosing frame. The liquid mixture will run into the holes, and, setting almost immediately, will keep the earth from falling away when the specimen is restored to its proper position, and the surface to be exhibited may then, if necessary, be treated as above described, with gum-water to secure the safe preservation of the earth galleries.

Beetles injurious to timber may be well displayed by choosing a piece of wood with characteristic specimens of the injuries caused by the kind of beetle to be exhibited, and drilling two small holes beneath the spot where it is to be placed, then passing a fine wire horizontally through the thorax of the insect, drawing the two ends through the drilled holes, and tying them securely at the back of the wood. If a pin is also passed through the beetle in the usual way, it will help to secure the insect in the desired position; and the head of the pin may be cut off or concealed by a touch of paint, so as not to spoil the life-like appearance of the specimen. Beetles, or other insects too small or soft in their texture to be treated in this manner, may be fixed by gum, glue or marine glue, or a single pin may be driven through so deeply into the wood that the head of the pin rests on the insect, and sometimes by carefully lifting one of the elytra of a beetle the pin may be passed through beneath it, and the wing-cover returning to its place will entirely conceal the artificial support.

Pupæ may be fixed with glue and concealed pins, and the larger larvæ, such as those of the goat-moth, may be well represented by plaster models from life, fixed in the injured timber from which the original was taken: but in all these matters the characteristic position and colouring of the insect should be well studied before any attempt is made to represent it, and all artificial attachments or supports should show as little as possible. If it is quite unavoidable that they should appear, a little earth or wood-dust applied to the surface of the glue or gum, and a few touches of paint on the wires will usually deaden them, so as to attract little notice.

Besides the substances mentioned, there are others still more perishable, such as fruit, leaves or roots, which it is necessary should be represented, in order to give perfect illustration of the destructive powers of many of our insects. In some cases these can be shown by accurate drawings; in others, models in wax or plaster give a satisfactory representation, and in the Entomological Collection of the Horticultural Society at South Kensington are many specimens of models in plaster of Paris, representing vegetable substances injured by insects, the insects themselves in their larval form, and other subjects connected with economic entomology. The process of making these is as follows:—

The object to be modelled should first be coated thickly and strongly with wax; this may be done by placing it on a smooth board which has been slightly damped to prevent adhesion, and then brushing the melted wax rapidly over it with a camel's-hair pencil. The wax should at first be almost boiling hot, so that it may flow from the brush like water, and leave no marks where the successive applications join each other, and when a thin coating of wax has been secured over the entire surface of the object (or such parts as it is desired to model), the mould should be gradually thickened by the application of successive brushfuls of the rapidly cooling wax till it is of the required strength.

If the object to be modelled is a leaf, it is best to remove it from the mould before the wax is perfectly cool. In this state it can be gently lifted and drawn from the mould without injuring the most delicate folds. If it is a fruit or root, the wax should be left untouched till it is thoroughly cold and hard, and the object may then be cut away carefully with a knife or curved chisel, the central part being first gradually removed till a mere film remain of the rind or bark of the object immediately touching the wax mould. This may be broken away or withdrawn by a pair of forceps, and removed through the opening which has been left where the object was placed on the modelling-board.

The cavity is then to be filled with plaster of Paris, mixed smoothly with water to about the consistency of cream, and laid into the mould in successive brushfuls with the kind of paint-brush known as a hog-tool. Much of the beauty of the model depends on the care exercised in this part of the work. If the plaster is sufficiently liquid, and worked well into all parts of the mould with the brush, all is well; but if the plaster is too thick, or allowed to run at once in a mass into the mould, air-bubbles and other defects are most likely to appear, and the model to be totally useless.

It is necessary to procure the best plaster of Paris, such as may be procured from the London dealers, as what is procured in country towns seldom sets properly, and consequently causes much disappointment. When the plaster has set firmly, the wax should be removed by pouring scalding water over it; and the model, after having been properly dried, either by warmth or by setting it aside on blotting-paper for some days, should be carefully examined, and all superfluous plaster and imperfections removed, and it will then be ready for colouring.

In colouring, the great object is to give the natural tints without injuring the perfect representation of texture of surface already obtained; unless the colouring materials are used with great care, the fine markings which, through their truth of representation, give the life-like appearance to the model, will be lost sight of, and its value much deteriorated.

To meet this point, we should be careful to avoid the application of paint in layers, which are liable to leave the projecting parts bare and the fine depressions clogged, and to render evident the markings of the brush and the junctions of the various tints of paint. If the model is prepared by being soaked on the surface with drying oil, and, after being slightly warmed, the paint (which should be the ordinary good oil-paint used by artists) is, so to say, floated with the brush over the surface, allowing the tints to blend and run into each other in some places, the superfluous matter being carefully removed from the hollows with a fine brush,—this method will usually, with care and patience, succeed, so that the object may be satisfactorily tinted in a very short time, and will only require the addition of a few characteristic touches (or possibly corrective washes of transparent tint), applied where requisite, after the first coat has dried.

The minutiæ of work, such as kinds of varnish and different methods of manipulation, would be too long in detail to enter on here, but it may be added that the natural appearance of the model may often be much enhanced by the addition of such parts of the original as are durable. For example, the dry scales of the pseudo-bulbs of orchids, or the outer coats of some bulbs, may be carefully removed from the object to be modelled before the mould is taken, and, being replaced on the model in their proper position after it has been tinted, will give a truthfulness and beauty to the work which could be obtained in no other manner.—*Gardeners' Chronicle.*

THE USE OF WAX, TALLOW, ETC. IN SUPPOSITORIES.*

BY CHARLES L. EBERLE.

Pure cacao-butter may be asserted to be but rarely if ever met with in the drug market. The samples for sale vary sensibly in colour and consistency, and no positive rule for judging of a pure article by cursory examination can be offered. A candid admission by several prominent manufacturers of the article, reveals the fact of its frequent adulteration, and since the extended demand and sale of this production for cosmetic and suppository application, a greater variety of mixtures known as butter of cacao is to be found than formerly.

The pharmacist, however, but seldom applies it to uses other than in the preparation of suppositories, the successful use of which depends upon a base, whose point of fusion will correspond to animal heat, which can be handled readily when in form, and which, upon exposure to the natural heat of the body, will promptly liquefy not melt slowly, thus depositing quickly the medicating ingredient upon the surface to which it has been exhibited.

The butter of cacao most satisfactory for pharmaceutical use is of a dirty white, inclined to yellow in appearance, firm under pressure, yet disposed to yield its surface when held in the hand by the warmth thus imparted, fusing readily at or about 98°, which sets rapidly after fusion when exposed to cold, and which, after such exposure, maintains its original character at ordinary temperatures.

Such cacao-butter may be had, and under proper manipulation it needs no addition of a hardening ingredient to adapt it to suppository use.

Cacao-butter at 98° F. liquefies. This is more apparent in the rectum or vagina than by merely holding in the hand. The mixtures, I mean the mixtures made by the pharmacist with the cacao-butter of the market, vary in their behaviour in proportion to the quantity and character of the hardening ingredient used in connection with it.

A considerable proportion of cetaceum may be added without materially affecting the value of a suppository; at least ten per cent., if combined with the butter, will produce a suppository which will not be likely to be complained of by the medical profession, but the slowness with which this alloy, so to speak, fuses, makes this or the addition of any hardening substance a serious objection. We need promptness of action in the application of medicines by suppository, which can be best secured by rapid liquefaction of the excipient, and no mixture or single substance combines the essential requisites so completely as a good sample of so-called cacao-butter.

The addition of wax to cacao-butter is to be reprehended. While, under restriction, a mixture may be formed which will harden more quickly and bear more handling than the butter alone, the reflecting pharmacist will bear in mind the slowness of its fusion at anim

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* Paper read at the meeting of the American Pharmaceutical Association.

heat, and the consequent suspension of the medicine, which should be diffused and deposited over as large a surface as possible.

Content with the simple fusion of such mixtures, the ease with which they may be manipulated, and the temptation to dispense quickly, the more important fact has been overlooked by many, who will, doubtless, correct the error in their future operations. I have invariably found that when the additions were not large enough to render the use of the moulded cones inadmissible, there was no advantage gained by a combination of base or excipient.

With regard to the effect upon the animal tissues of such applications of hardened suppositories, I can only say that where they are of such a character as to produce local irritation, the uneasiness induced requires their removal; this objection is now but seldom met with. Within the past two years the education of the pharmacist has materially advanced in this direction, so that none of repute dispense cones that will not at least fuse at animal temperature, however slowly this fusion may occur, or however imperfectly they may medicate from the suspension of the medicine until its ejection by the action of the parts. Those having but occasional prescriptions for them, are now in the habit of depending on the larger retail establishments, who furnish the trade with a great variety.

There need be no apprehension of a local irritation arising from the use of wax, if not carried beyond the proper fusing-point. As much as fourteen per cent. is used by pharmacists of good repute, without complaint in this respect. The mixture fuses quite slowly at animal temperature, but there is no apparent dissection of the cone, whereby the wax is separated from the butter *during fusion*, however much this may be the case when the melted substances are allowed to cool *ad libitum*. There is a uniformity of constitution so long as the heat is present.

Slow manipulation with a mixture of wax and cacao-butter before hardening, we can readily understand, would cause a granulation of the wax, and produce a cone in which the heat to which it is to be subjected would act only upon the cacao-butter, to the exclusion of the wax, which would then remain unchanged, causing irritation and difficulty; but we are only supposed to be dealing with mixtures which have been well stirred at the time of their introduction into the mould, which mould has been thoroughly chilled, and the suppository likewise. Under such circumstances the mixture is uniform and perfect, and shows no disposition to separate on fusion, if the heat be maintained at that point.

The difficulties in a proper understanding of the preparation of suppositories without the addition of a hardening ingredient in connection with cacao-butter have been solely those of manipulation.

Experience is leading many to prepare the excipient with a smaller proportion of wax, spermaceti, etc., than they at first thought necessary, until the quantity used by some is so trifling as to practically amount to little or no use.

Of the various mixtures, those of one-eighth spermaceti or one-fourteenth or less of wax are least objectionable. Tallow suet or paraffine produced no results not secured by the first-mentioned, while there were some objections to be attached to their use not present in the others.

Now while some have discovered points of manipulation to make these suppositories of *cacao-butter alone*, rapidly and well, (and how much often hangs upon a very slight thread in this respect!) far exceeding in value those I am about to offer to you, I will simply state the mode which gives me the most satisfactory result.

The mould is of brass; a clamp hinged at one extremity and handled at the other, held firmly in place by a ring slipped over said handles; the cones are turned from the interior face of the clamps, as in an ordinary bullet-mould. It should mould at least one dozen, and be improved by the addition of a loose clamp, to be attached firmly in the centre and at the bottom of so long a tool, to prevent the loss of the fused mass before congealing, by running from between the plates.

This mould should, so far as possible, be thoroughly chilled and ready for use. To place the fused butter in the mould while it is warm, and cool both by the same operation, almost invariably results in the contraction of the metal upon the cool cone to a degree that upon the attempted separation of the matrix every cone will be split in two. When the mould is thoroughly cooled, the butter sets rapidly, and in fifteen or twenty minutes the suppositories will drop from the matrices by their own gravity.

The deductions I draw from a close observance of this subject for the past two years are, that the addition of a substance such as wax, spermaceti, etc. to cacao-butter produces a mixture requiring a higher point of heat for its fusion, and in proportion to the amount of such addition; and that when such addition is made, if it should not be sufficient to prevent the fusing of a suppository at animal temperature, no irritating or harmful effect is produced either upon the vagina or urethra. Where a larger quantity than that mentioned above is added, the annoyance produced requires the removal or ejection of the suppository before any harm may be done.—*Proc. Amer. Pharm. Assoc.* 1870.

PROCESS FOR PREPARING LIQ. FERRI TERSULPHATIS AND LIQ. FERRI SUBSULPHATIS, U.S.P., WITHOUT THE FORMATION OF NOXIOUS GASES.

BY J. CREUSE.

The best method for preparing the persulphates of iron perfectly pure is, undoubtedly, to run a stream of chlorine gas through a solution of the protosulphate previously acidulated with the proper quantity of sulphuric acid. But this is obviously impracticable to most pharmaceutists. The Pharmacopœia of the United States prescribes to oxidize the protosulphate of iron by means of nitric acid, a certain proportion of sulphuric acid being added. This is more practicable, and yields a good product, but is liable still to several objections. Expensive vessels are required for boiling a mixture of sulphuric and nitric acids; a good draught is also necessary for the escape of the nitrous fumes, and very often during the operation the vessels are broken, or the operator is annoyed by the poisonous gases escaping into the room. For these reasons, many pharmaceutists prefer to buy the articles ready made; they have to pay a high price for it, and to depend on the manufacturer for its strength and purity.

I propose this new method, by which any pharmaceutist may prepare his own liq. ferri tersulphatis or his liq. ferri subsulphatis on his very prescription-desk, if need be, and with the usual implements found in all drug-stores.

℞. Sulphate iron in coarse powder, 12 troy ounces.
Sulphuric acid, 2 troy ounces and 60 grains.
Chlorate of potash, 348 grains.
Boiling water, 12 fluid ounces.

Dissolve the sulphate of iron, in the boiling water, in a glass matrass, or any convenient bottle. Add the sulphuric acid gradually, and, while the liquid is hot, add the chlorate of potash by small portions. When all is dissolved, filter and complete 24 fluid ounces. The whole operation need not take more than fifteen minutes.

The following equation explains the reaction:—

$$12FeO,SO_3 + 6SO_3 + KO,ClO_5 = 6Fe_2O_3,3SO_3 + KCl.$$

This process has the advantage of giving out no fumes or smell of any kind; the product is free from any acidity but what belongs to the salt itself.

It is true the persulphate of iron thus obtained contains a small quantity of chloride of potassium, but this does not interfere with any of the uses for which it is wanted by the pharmaceutist. I think that the nitric acid always present in the preparation of U. S. P. is much more objectionable. Besides, any one who has followed the U. S. P. process knows that it is always when one tries to get rid of the last traces of nitric acid that the porcelain or enamelled dishes are broken.

A slight modification of the formula will give the liquor ferri subsulphatis U. S. P.:—

℞. Sulphate of iron, coarse powder, 12 troy ounces.
Sulphuric acid, 1 troy ounce and 30 grains.
Chlorate of potash, 340 grains.
Boiling water, 10 fluid ounces.

Operate as above, and evaporate to 12 fluid ounces. Filter.—*The Physician and Pharmacist, Feb.* 1871.

AMERICAN SUMAC.

Since the war, and in the reversal of fortune consequent thereto, many of the people of the South have turned their attention to other sources of revenue than the former staples of tobacco, corn and cotton, and this necessity has developed new and heretofore neglected sources of revenue. For instance, it is said that one county alone of the State of North Carolina shipped North last winter about $100,000 worth of quails (called partridges there), not to speak of the new industry of "*truck farming*," in which men are now making fortunes, who a few years ago would have thought it almost a disgrace to sell so apparently insignificant a thing as a strawberry.

Among these new industries, and rising rapidly into importance, are the gathering and manufacturing for market of sumac. This article is used as a dyestuff and for tanning morocco. Formerly all used was brought from Europe; now the Southern States supply a large quantity, already supplanting the low grades of the foreign article, and it is hoped ere long also to take the place of the finer grade.

The difference between American and foreign, or, rather, American and Sicilian first grades, is probably due to the fact that the latter is cultivated; the former is as yet a wild product growing on those vast fields of so-called worn-out land abundant through the South from their former wasteful system of farming. However, one of the largest dye-manufacturers says that the tannin in the Southern sumac seems to be in a different form from the Sicilian, and hence the latter is still preferred by dyers, especially for fine work. Still this may be due merely to cultivation, as all know the changes that have been made from time immemorial in various grains, grasses and fruits by culture and care.

Tanners of morocco say that the Southern sumac, when carefully gathered, free from sticks and dirt, the leaves and leaf-stem only, is equal in tannin strength to the best Sicilian; that with Sicilian at $175 per ton such sumac finely ground should bring $125 per ton. The usual price is $50 to $90, and it has sold at $110. It is like everything else; it pays to put it on the market in the best order possible.

In treating of the operation of gathering and preparing for market, we shall first state something of the different varieties of sumac. There are six botanically different varieties of sumac in the United States; of these, three are of value, one is of little or no use, and two are poisonous. The first three resemble each other very much in leaf and size, growing from four to ten and fifteen feet high, chiefly on dry uplands, in old fields. Of these three, two have hairy berries and one has a hairy down on the branch, like that on a deer's horn in summer; the third has a perfectly smooth berry and branch. The leaves of all these are valuable, though probably, if care were taken to keep them separate, the hairy or stag-horn sumac would be found most valuable for dyeing.

Of the other three the dwarf sumac, one or two feet high, is valueless; another grows only in swampy places, and while its juice is said to make a fine varnish, used largely in Japan, yet it is so poisonous to many persons that it is best let alone; the third is the well-known poison oak.

In gathering the sumac, leaves and leaf-stems should be carefully picked without any of the woody stem, then dried under cover on lattice-work shelves to give free access to air, frequently stirring or turning to prevent heating. When thoroughly dried, at the end of two or three weeks, it is sent to New York or to the nearest mill for sale. In this state it is worth from $1.25 to $1.75 per hundred lbs., but woody stems and dirt detract from its value very much. The buyer in the interior of Virginia, North Carolina, South Carolina and Georgia can seldom afford to pay more than $1 per hundred.

At the mill it is ground very fine and screened. The mill is of the usual drug-mill form: an upright wheel revolving on its edge in a circular trough, as the old-fashioned mill for grinding clay. It should be tightly enclosed; if not, a large quantity of the light, fine powdered sumac will escape and be lost. On care and economy in this operation depends the miller's profit. After grinding, it is screened and packed in bags, 162 lbs. to the bag, and thus sent to market. The bags to hold this quantity should be cut out 40 × 60 inches. Fourteen such bags will hold a ton. This is exactly the style and weight that Sicilian sumac is packed as sent to the United States. To sell well, it should be of a light green colour.

The time of gathering is from July 1st to just before first frost, not later; in some parts it may commence earlier. It should be done when the flower is in full bloom, not before.

It is stated that the consumption of sumac in Great Britain is over 20,000 tons per annum, and that it is yearly increasing. In the United States 3500 tons of native, and perhaps 3000, or over, of foreign are used; probably 500 tons of native growth are exported. As the demand and uses for leather never grow less, it is not at all probable that all which the South can produce, if properly prepared, will ever fill the needed supply; and if it should create a plethora on the market, it would only cause new uses to be found for it, or engender the production of a finer article.

There is no reason why at least 5000 tons should not be exported to Europe, besides supplying home demands. The mill machinery is said to cost $2500 without power. With the crude article at $1.50 per hundred even, $12 to $15 per ton for grinding and bags, $10 for loss, and $10 for freight to New York, there is certainly a fair margin of profit at $90 per ton, at least, which price a good article will certainly always bring in New York. These figures of cost, also, are rather high. There is plenty of room for at least ten more mills in the now unoccupied field of North Carolina, South Carolina and Georgia. Any good business place in the upper or middle sections of these States will do as a site.

We have stated that sumac is used for tanning and dyeing. For these purposes the user generally makes his own decoctions, and uses them when fresh and warm. It is stated that the liquor injuries by standing. For tanning it is valued, as it does not discolour the leather. It is used in the same manner as a decoction of bark. Best Sicilian contains, according to Muspratt, sixteen per cent. of tannin and Virginia ten per cent. We have no doubt the vastly improved mode of gathering and preparing the American sumac will now increase its quantity of tannin.

In dyeing it is used to produce a fawn and a rich yellow, a black, a peculiar shade of green, and a red. The mordants are usually tin or aluminous substances.

With Brazil wood and tin solution it produces a red; with copperas and logwood a rich permanent black. With a solution of chloride of tin alone, a rich yellow, and this with Prussian blue, shades of green. It is used chiefly as a base, and has the quality of giving great permanency to the colours dyed with it. The leaves of the hairy species called staghorn are considered best to dye yellow.

The sumac berries are of very little value, though we think in the progress of science a use will be found for them. They are said to contain large quantities of malic acid. They are now used in small quantities by the druggists, and when ripe make a very refreshing and cooling beverage. They should by all means be kept out of the gathered leaves, as they contain a red dye, hence would injure the quality of the sumac.—*Scientific American*.

POPPY FARMING IN QUEENSLAND.

A successful attempt at poppy farming is reported from Queensland. A specimen of opium, grown by Mr. Tatnel in the Toowoomba district last season, has been exhibited, consisting of five cakes weighing one pound each, which was part of the produce of a quarter of an acre of poppies. The quality was so superior that the whole exhibit was purchased by a medical gentleman in Toowoomba at £3. 10*s*. per pound. The net proceeds of the crop will amount to £28 or £30.

We extract the following particulars as to the cultivation from the *Brisbane Courier*:—

"The first advice given by Mr. Tatnel is to be exceedingly careful in selecting the seed (*Papaver somniferum*). This appears to be the main point, as on this hinges ultimate success. There are some kinds of poppies very similar, in many respects, to the true Turkey, but which are not adapted to this climate. The East Indian seeds germinate quite as freely, but the Turkish plant will blossom nearly three weeks before it. The former, also, has but one capsule, and upon incising it only a small quantity of gum will exude, and subsequent incisions will not produce further discharges.

"The white poppy plant is also very similar to the East Indian, but equally unprolific. Opium can be obtained in greater or less quantity from all the poppy species, but the main object is to select those sorts which will yield the greatest profit to the grower.

"The poppy must have rich ground, either naturally so, or through the application of manure. Land which has been worked previously for a root-crop, and brought into fine tilth by the cultivator and horseshoe, is better than new land for this plant, for as it has a tap-root any interference with the downward course of the latter will prevent the flow of opium. It ought to be sown in drills, from eighteen inches to two feet apart. The objections to the broadcast system of sowing are:—First. That when making incisions it is very difficult to distinguish between those plants which are cut, and those uncut. Secondly. When gathering it is impossible to avoid coming in contact with the liquid gum, thus causing a great waste. Sow the seed in the drills in the first instance, as transplanting is so difficult and uncertain, with such delicately tap-rooted plants. The tap-root resembles a piece of cotton thread, and it is almost impossible to remove it without injury. The time for sowing in this district is from the middle of May to the end of June, but it would be well to get as much of the sowing completed as soon as possible before the end of May. Frosts will not affect the poppy plant, nor will watering too freely benefit them, warm dry weather being the most favourable season for a large return of gum. The plant may be made to grow very rank, through the application of liquid manure, but the extra quantity of produce will prove a thin milky substance, which, when dry, is not worth the trouble of collecting. The system of gathering is very simple, and may be performed by careful children. The yield per acre has been estimated at from 35 to 40 lb., and the price for the raw and unadulterated produce would range from about £3 to £3. 10*s*. per lb."

The following practically explains the gathering process:—

"The time to cut the capsule is from two to three days after the flower-leaves have fallen off, when it will be about the size of a walnut. There are two methods of doing this, which have been found to answer; the first is by making several longitudinal cuts from the base to the crown; the second to make two horizontal incisions one above the other half-round the capsule, the cuts to be made with a sharp knife, and made in such a way that they should have an upward slope, by which means—should the knife penetrate through the shell of the capsule—inward bleeding and consequent loss of gum will be prevented.

"The latter plan was found to be the best. The knife used should be one having two blades one-sixth of an inch apart, with a guard upon the blades to prevent them cutting too deeply. The cutting process should take place during the evening, as the gum exudes in greater quantities during the cool hours of the night than in the day, and will be found in a fit state to gather when the sun has been on it for an hour or two in the morning.

"Those who are to collect the gum should be furnished with a blunt knife, with which to scrape the heads, and have a sharp-edged tin fastened by a strap round the waist in which to collect the opium. The tin must have a sharp edge, as the opium adheres very firmly to the knife, from which some force is required to remove it.

"Towards the evening, hands can be set to work to cut the heads a second time, making the cuts on that side of the capsule left uncut the previous day. The process, as described, may be continued each day until the heads cease to yield sufficient gum to make it payable.

"In conclusion, the opium collected should be dried in shallow plates to a proper consistency to work into flat cakes weighing about half a pound each, and let this be done as early as possible, for it soon becomes musty if not properly dried. When it is worked into the required shape, cover it with poppy leaves and keep it in a dry place.

"The plant may be grown with profitable results for capsules alone, and with very little risk to the cultivators. The capsules are worth 35*s*. per thousand in Melbourne, and the yield per acre is from thirty-five to forty thousand, according to season.

"We understand that, independently of the yield of opium, Mr. Tatnel has also obtained a fair crop of seed, a portion of which he will no doubt distribute among his friends and neighbours before the planting-season, which is now rapidly approaching."

In connection with the subject of the entomological prizes offered by the Royal Horticultural Society,* we have great pleasure in reproducing in another part of this Journal an article from the *Gardeners' Chronicle*, containing some valuable advice on the preparation of specimens.

NOTICE.—In answer to several inquiries we are enabled to state that Ashworth's Patent Looped Binder Folios, made to hold six, thirteen or twenty-six numbers of the PHARMACEUTICAL JOURNAL, are now ready, and may be had of Messrs. Taylor and Co., Printers, 10, Little Queen Street, London, W.C., price 1*s*. 6*d*. Binders, 6*d*. per gross.

* See *ante*, p. 931.

The Pharmaceutical Journal.

SATURDAY, JUNE 3, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

LIME AND LEMON-JUICE.

IT is well known among those chiefly interested in the subject that one of the main objects of the Merchant Shipping Act of 1867 (commonly called the DUKE OF RICHMOND'S Act) was to ensure a supply of genuine lime and lemon-juice to the crews of merchant ships. Past experiences went to prove that a large proportion of so-called lime-juice, put on board ships bound to distant parts, consisted of solutions of citric, sulphuric or other acids, entirely inert, and sometimes harmful. Scurvy continued to prevail, and hence it was enacted that all lime and lemon-juice shipped for the use of sailors shall be examined by a competent officer, mixed with a certain amount of spirit, and bottled under the direction of customs' officers. There can be no reasonable doubt that this system has succeeded remarkably well, as it has secured a proper supply of good juice to the mercantile marine, and as scurvy has in consequence diminished by from 60 to 70 per cent. But there are two unsettled and very important questions in connection with this subject which pharmaceutists should be specially able to aid in deciding. (1.) The exact analytical standard of lime and lemon-juice. (2.) Does genuine lime and lemon-juice require the addition of alcohol for its proper conservation? As to (1) we would remark that the Marine Department of the Board of Trade have delegated the official examination of lime and lemon-juice in connection with the working of the Merchant Shipping Act of 1867 to the Laboratory Department of the Inland Revenue, and that no very delicate analysis is required to determine the genuineness of the juice. But inasmuch as the antiscorbutic value of lime and lemon-juice does not appear to depend upon a single ingredient, but upon the combination, it is eminently useful and necessary to know exactly the proportions of the constituents and the particular way in which they are combined. The late MASTER OF THE MINT separated, with great care, the colloid and crystalline principles of the juice, and submitted them for practical experiment to the officers of the Seamen's Hospital, with a view to aid in determining whether the therapeutic value of the juice existed in the former or the latter principle.

There is no doubt that the second point should immediately engage the serious attention of chemists, inasmuch as whenever the Merchant Shipping Code is discussed in Committee of the House of Commons, an energetic attempt will be made to do away altogether with the "fortifying" section of the Act of 1867, and to send the juice aboard ship "unadulterated" with spirit of any sort or kind. The positive therapeutical effects of lime and lemon-juice can be best determined by medical men, but pharmaceutists may render very valuable aid in assisting to determine accurately the points above mentioned. And a rider may be added to the investigation, indicating the comparative differences between the juice of the lime and the lemon, so as to aid the physician in determining, if possible, which of the two may be recommended as the more valuable prophylactic against scurvy.

RECOGNITION OF BLOOD-STAINS.

DR. LETHEBY'S recent reference to the use of the spectroscope for this purpose in medico-legal inquiries has called forth from a writer in the *Lancet* the following remarks:—

"The spectroscope, as many of our readers will know, came into use as an instrument of chemical analysis thirteen years ago, and was originally employed for the detection of the alkali-metals and a number of other metals, the substances to be analysed being heated strongly in a colourless flame, and made to yield incandescent vapours, the light from which, passing through a prism, furnished characteristic spectra. These spectra consist of narrow bands of light, quite sharp and distinctly defined, and having much the aspect of bands of narrow China ribbon. They have *fixed colours* and *fixed position* in the spectrum. The value of this kind of analysis was most strikingly exemplified by Bunsen, its discoverer, who by means of it discovered two new alkali-metals, cæsium and rubidium. Later, Mr. Crookes discovered the metal thallium by means of spectroscopic observation; and still later a fourth new metal, indium, was recognized in the same manner. In each of these examples chemists operated upon incandescent vapours, and it was the presence of a *narrow bright line* of peculiar colour, and occupying a *perfectly fixed* and *definite position* in the spectrum, which led to these important discoveries. A second kind of spectroscopic observation naturally suggested itself to chemists, viz. observations of spectra given by passing colourless light through coloured solutions; instead of light from incandescent vapour, light from a coloured liquid was sent through the prism.

"This second kind of spectroscopic observation is, however, not so satisfactory as the first. There are no sharp and brilliant bands of light, standing out like China ribbon, and perfectly unmistakable by all eyes. Instead of striking appearances of this kind, all that is to be observed is a little *dimness* here and there in the spectrum. The dim spaces which are not sharply bounded have been dignified with the name of *absorption bands*, and many of them are so little conspicuous as to be invisible to all but the highly educated eye.

"No discovery has as yet been made by means of these spectra; and but for the great success which attended the first kind of spectrum-analysis very little weight and importance would be allowed to the indications of the second.

"In the spectra of incandescent vapours there are, as we mentioned, narrow bright lines of light. There are also bright tracts in these metallic spectra. Now, if there were only these illuminated tracts, and not the lines of light, the spectrum of an incandescent vapour would degenerate, for analytical purposes, into the condition of the spectrum furnished by light after transmission through a coloured liquid. The spectrum-analysis of blood does not deserve the highest degree of confidence."

This conclusion is likely to be zealously controverted by the admirers of spectroscopy, though the late supposed discovery of a new element through its aid, and by two philosophers simultaneously, is perhaps calculated to raise some doubt as to the spectroscope being a safe guide in such important cases.

INDIAN QUININE.

The Indian papers give a very unsatisfactory account of the results obtained in the manufacture of bark alkaloids lately attempted by the Government. The subject is of such importance that we extract the following documents from the *Calcutta Observer* and the *Englishman*. We believe the statements made are in the main correct. There seems to be some little discrepancy as regards the issue of the impure product, but we have been promised further information on the matter from Professor De Vrij, which will no doubt put it in a proper light.

"Does the Government of India eat pickles? We know that a late member of that Government, who is now obtaining a considerable amount of public attention, devoted much of his time to the study of that important condiment. We see no internal evidence of its still finding a place in the dictary scale of the members, at all events of the Legislative Council; and we, therefore, venture to request the serious attention of Government to the humane caution which Messrs. Crosse and Blackwell are in the habit of affixing by labels to their bottles, warning the public against being unduly attracted by the beautiful green of the preparations of other vendors into poisoning themselves with copper. We must, then, ask them if they are aware that they are issuing under their sanction a preparation by the side of which the dangers of green pickles sink into insignificance. We understand that the officer in charge of the Government cinchona gardens has produced, with immense satisfaction to himself and the Government, a preparation which he is pleased to call 'amorphous quinine'; if this preparation has one quality of which he is more proud than another, it is its beautiful green colour, so soothing to the eye of a fevered patient, so suggestive of the luxuriant growth of the Government gardens, and, we are afraid we must add, of the skill of its manufacturing agents. This pleasant-looking drug has been largely issued to the heads of departments for experiments in the public hospitals and dispensaries. If some fortunate accident had not prevented its actual use, there is reason to fear that the result of the experiment would have shown itself in a large increase in the death-rates of our hospitals, which would no doubt in due course, and according to well-established precedent, have been attributed to inappropriate buildings or insufficient ventilation. But, happily, Government has been saved from being placed in the position of a druggist ignorantly compounding and dispensing poison by the discovery made by Dr. Simpson, who is now sitting on the cinchona committee, that this green drug is little more than a cunningly-devised mixture of copper stewpan and bark, displaying, it must at all events be admitted, considerable skill in the dissolving of the stewpans. We trust that the escape will teach the Government that it is not real economy to entrust the more delicate chemical operations to a European gardener assisted by Booteah coolies. If a private manufacturer have a business of this sort in hand, his first endeavour will be to secure the best available skill for its superintendence; but the financial policy of the present day takes an opposite view, and thinks control of expenditure, without the slightest regard for future profit or loss or consequences in any form, is all that it has to look to."—*Calcutta Observer.*

"It is stated that the new product of the cinchona bark, lately furnished by the Superintendent of the Darjeeling plantations for distribution to medical officers, is largely contaminated with poisonous quantities of copper. This gentleman had prepared a substance which he believed to contain the whole of the cinchona alkaloids jumbled up together, and forwarded it with a view to its febrifuge and anti-periodic powers being subjected to crucial trial in some of the large hospitals. He supposed that this compound contained all the febrifuge principles of bark; and the reason assigned for stopping short of isolating the various alkaloids, such as quinine, quinidine, cinchonidine and cinchonine, is economy of manufacture. Hence the attempt to introduce this substance of unknown chemical composition and strength. Such an attempt is essentially a retrograde step in science, and could only have been initiated by ignorance of the modern tendency and principles of therapeutics, the whole scope of which has been to procure the separation of the active principles of drugs in a manageable form, so that their doses may be fixed with certainty, and the powers of those doses ascertained with the greatest attainable exactitude. This has already been done with reference to elaterium and morphia, and also with reference to quinine, quinidine, cinchonidine, and cinchonine; yet Mr. Clarke now asks medical men to go back to the old system, in defiance of the teachings of organic chemistry and therapeutics, and to substitute imperfection for perfection, uncertainty for certainty, in a matter, concerning the welfare and lives of thousands of human beings.

"If there cannot be found in India scientific talent sufficient for the isolation of the cinchona alkaloids in a pure form—and we believe that such is available—by all means let the process of manufacture be stopped at a stage when all the alkaloids are believed to have been concentrated in a small compass. But let the substance thus obtained be sent to Europe for sale to the manufacturers, who know how to properly work the mixed mass. In the name of humanity we protest against this raw compound being foisted upon the hospitals of this country,—a proposal as unscientific and unsound as it would be to substitute opium or the squirting cucumber for morphia or elaterium, on the ground that a saving would be effected thereby in the manufacture. The gentleman from whom the idea emanates, although holding a quasi-medical appointment, is not a medical man, or he would have shrunk from the risks to human life which would inevitably follow the practical adoption of his scheme. The powder has been used in Madras, where the fevers are of a very mild type, and, as was to be expected, a fair number of recoveries are noted. So it was with the "Jesuits' Bark" in the seventeenth century. But just as the latter had to be abandoned for quinine, so it would be folly and cruelty now to return from the pure form of the medicine to Mr. Clarke's raw material. The dangers of such a course are increased by the medical ignorance of the present superintendent. The substance which he has supplied for hospital use is found upon analysis to contain 20 per cent. of the poisonous carbonate of copper, or $10\frac{1}{2}$ per cent. of the metallic copper! The presence of dangerous adulteration in such quantities indicates either gross incapacity, or almost criminal carelessness in the preparation of the drug. Fortunately, the timely discovery of the poisonous admixture had been made, we believe, by a member of the Cinchona Commission before the powder was issued from the medical stores for trial. Had this discovery not been made in time, a large quantity would have been distributed, and disastrous consequences must have resulted from large doses of a poison cumulative in its operation, and deadly in its effects.

"The announcement of this fact, we hope, will make the Government pause before they commit the extraction of the cinchona alkaloids to persons unacquainted with the delicate chemical processes requisite for their successful isolation and purification.—*The Calcutta Englishman.*"

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

May 24th, 1871.

Present—Messrs. Allchin, Bourdas, Carteighe, Cracknell, Davenport, Deane, Edwards, Gale, Hanbury, Haselden, Ince and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

Thirty-four Candidates presented themselves, viz. six Major and twenty-eight Minor; the following twenty-four passed, and were declared to be duly qualified to be registered:—

MAJOR (as Pharmaceutical Chemists).

*Freeman, Ernest	Stourbridge.
*Catterns, Heneage Parker	London.
Troake, Marler Hamilton	Kingsbridge.
Sambrook, William	Cardigan.

MINOR (as Chemists and Druggists).

	*Selley, John	Aylesbury.
	*Wilkes, John Sanders	Stafford.
	*Dolman, William	Cheltenham.
	*Barnes, Francis Joshua	Preston.
	*Hill, Walter	Cheltenham.
	*Threlfall, Hugh	London.
	*Barclay, John	London.
	Webb, Herbert Charles	London.
	Ellwood, Francis Henry	Norwich.
	Cooper, Anthony Vincett	Birmingham.
	Stansby, Charles John	Derby.
	Smith, Arthur John	London.
	Brown, Richard Fearon	London.
	Wilson, Thomas	Blackheath.
	Forsbrook, William Henry	Birmingham.
Equal.	Carr, George	Sheffield.
Equal.	Cordley, William Bains	London.
	Smyth, Arthur William	Diss.
	Tonks, Joseph	Wolverhampton.
	Parker, William	London.

The above names are arranged in order of merit.

The certificate presented by the undermentioned was received in lieu of the First or Preliminary Examination:—

Sergeant, William R. .... Boston.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Thirteenth and concluding General Meeting of this Association (Twenty-second Session) was held at the Royal Institution on Thursday evening, the 11th inst.; the President, Mr. John Abraham, in the chair.

Mr. S. G. Hilditch made the following communications:—

Liq. Myrrhæ Co.—A convenient method for the easy preparation of mistura ferri composita, according to the following formula—

℞ Ferri Sulphas gr. xxv
Aq. Rosæ ℥viij
Liq. Myrrhæ Co. ℥ij } = ℥x Mist. Ferri Co. B. Ph.

Tinctura Ferri Acetatis.—The instructions given in Squire's 'Companion to the British Pharmacopœia' would not produce the preparation in accordance with the Pharmacopœia. Mr. Squire recommended the acetate of potash to be dissolved in 20 oz. of water; the Pharmacopœia ordered rectified spirit.

The President said that this was one of the most unsatisfactory preparations in the Pharmacopœia; he had made several experiments, but could not succeed in making a tincture which would keep an indefinite time.

Mr. Edward Davies, F.C.S., considered an alcoholic solution of acetate of iron an impossibility.

Tinctura Hyoscyami.—Large quantities of hyoscyamus leaves of first year's growth were used in making this preparation. It was necessary that it should be prepared from leaves of second year's growth. A tincture prepared from the former, when put into water, would remain perfectly bright, whilst the officinal tincture would become milky.* This was a simple test; the matter was of great importance, as it had been proved that the therapeutic effects of the two tinctures differed very materially.

Carbo Animalis Purificatus.—The result of his experiments was the production of 8 per cent. of animal charcoal from ordinary bone black.

Mr. Davies thought a good sample of bone black should yield at least 10 per cent.

An interesting discussion followed these communications, in which several members took part.

The President thanked Mr. Hilditch for his valuable information, and then delivered the following valedictory address:—

President's Valedictory Address.

This being the last meeting of the Session, I am expected to address to you a few parting words.

First, let me express my sense of our obligations to those gentlemen who have contributed to our instruction by interesting communications. One of the first of these was a valuable paper on ozone, by our Vice-President, Mr. Davies. Another was by Mr. Keith, on some of the newest processes connected with photography. I had not the pleasure of hearing it, but I was told by those qualified to judge that it was unusually excellent. There were also two able papers, well illustrated, on the chemistry of calico printing by Mr. Blair. We have been much indebted to our Hon. Secretary for his diligent attention to the duties of his office, and also for bringing before us the subject of chloral.

This new sedative has hardly maintained the place which was first assigned to it. Experience has shown that its use is not unattended with danger, and that for its beneficial application care and experience are required.

A thoughtful paper on the nomenclature of the natural sciences was contributed by Dr. Syme; but until we get a new science of geometry, I fear that we cannot abandon the use of arbitrary terms in the descriptions of most natural objects.

Our most interesting evening was unquestionably that on which our talented townsman, Professor Roscoe, favoured us with his lecture on solar chemistry; on which occasion experiments connected with spectrum analysis were shown in a manner more brilliant and effective than had been before seen in Liverpool. During the same evening many of our friends contributed to our entertainment and instruction, amongst whom I should particularly mention members of the Microscopical Society with their instruments. Mr. Albert Samuel exhibited very successfully an interesting experiment to illustrate Tyndall's theory of the cause of the blue colour of the sky; and we were indebted to Mr. Davies for experimental illustrations of the properties of explosive compounds.

The additions to the Library are deserving of special mention. First, a book of autograph prescriptions, compiled by Mr. Mee; secondly, fourteen volumes presented by the Pharmaceutical Conference from the fund sup-

* Passed with Honours.

* This communication was made before the publication of M. Donovan's paper on "Tincture of Hyoscyamus" in the Pharmaceutical Journal of the 13th inst., of the existence of which Mr. Hilditch was unaware.—A. H. Mason, *Hon. Sec.*

plied by Mr. Thomas Hyde Hills. For the selection we were indebted to Professor Attfield; for I am glad to say that our library is so well supplied with useful and valuable books that we had some difficulty in determining what we could advantageously add to it.

I am sorry that I cannot congratulate you on the numbers which have attended the classes of our school of pharmacy. But wherever the blame may rest—if there be blame anywhere—it must not fall on our teachers of chemistry, botany and materia medica, Mr. Davies and Dr. Carter, whose qualifications can hardly be excelled. The shoe does not yet pinch our young men very much, by-and-by it will be felt.

Our attention has no doubt often been called to the consideration of the causes of the unhealthiness of Liverpool, or rather—as I believe it would be more correct to say—of *parts* of Liverpool. To chemistry our town authorities are now looking for a remedy, and we shall wait with much interest for the report of the able chemists, Doctors Parkes and Sanderson, to whom the inquiry has been intrusted. In the meantime, I will venture to express my belief that a very large part of the unhealthiness of certain classes of the population arises from their sleeping in large numbers in very small rooms, with all access of air shut off. There is a popular idea that night air is bad, I believe that it is a pernicious error, and that we should take every means in our power for correcting it. Night air is at any rate far better than the exhausted air which has been breathed by any of our fellows.

Our kindred societies in Edinburgh and Bath have published price-lists, which I would recommend you to procure, particularly the more recent one published at Bath. It is very desirable that we should know what others think on this matter, and that we should do what is just and fair to ourselves and the public.

I am sorry to observe the death of our townsman, Mr. James Yates, F.R.S., who has taken so active a part for many years in promoting the adoption of the metrical system, and of the advocacy of which he was one of the principal and most munificent supporters.

Mr. Abraham concluded with a few other remarks, including an expression of thanks to Mr. Charles Sharp for his services in teaching an elementary botanical class.

Mr. E. Davies, F.C.S., in moving a vote of thanks to the President for his address and his conduct in the chair during the year, agreed with Mr. Abraham that among the causes of the unhealthy state of Liverpool, the one he had referred to was one of the greatest. He gave his experience of a visit he paid to a house in a court off a small street, in which he said the smell was something frightful. Overcrowding and want of ventilation, and that pernicious system of building houses back to back, and in courts with one end stopped up and the other end nearly so, were the great causes of the high death-rate in Liverpool. He admitted many other causes. The bad habits of the people, drunkenness and other things had their effects; but his own private opinion was that these others were the great root of the evil, and until they could do something in the way of providing dwellings for the poor outside the town, and razing to the ground a great number of these courts, and opening up some more complete channels for the air to go up from the river right through the town, they would not bring down the mortality of Liverpool to anything like a normal figure.

Mr. J. Shaw seconded the motion, which was supported by Mr. A. H. Mason, F.C.S., who drew attention to the injurious practice of householders allowing walls to be papered without having the previous paper removed, instancing cases where five or six were to be seen on one wall, thereby fostering disease and impure air.

The vote having been carried unanimously, the Chairman acknowledged the compliment, and the proceedings terminated.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

On Monday, May 15th, Mr. F. Sutton, F.C.S., gave a highly interesting lecture on Carbon, at the rooms of the above Association.

The lecturer began by remarking how difficult it was to make an isolated lecture really instructive, as the limited time at their disposal forbade more than a passing allusion to the most prominent characters of the subject under consideration, but he trusted that he should be able to interest them in some of the facts connected with carbon, and if this only led them to take up chemistry as an amusement, his purpose would be answered.

The lecturer then advocated the cause of "hobbies," and after reminding his hearers of the saying that "The man of one book was a dangerous opponent," he advised all present to make a "hobby" of either chemistry or some branch of natural history, assuring them that they would find such a course advantageous in every respect.

After noticing the various forms of carbon, and its universal presence in organic bodies, the lecturer proceeded to consider its use in the animal and vegetable economies, its importance in ordinary methods of illumination and heating, and, finally, the explosive compounds into which it enters.

The subject was well illustrated with striking experiments, and elicited repeated applause.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The Second Annual Meeting of the above Association was held at the Temperance Hall, Birmingham, on May 26th. In the unavoidable absence of the President, the chair was taken by Mr. H. Whittles. We regret to say there was but a small attendance of members.

The Honorary Secretary read the Report of the Council, and the Chairman the statement of accounts.

Report.

"Following the precedent set at their first annual meeting, the Council beg to submit a simple statement of their proceedings during the past year.

"It will be in the recollection of some here present that at our last annual meeting a letter addressed to the Home Secretary respecting the Petroleum Act of 1868 was ordered to be forwarded. It was to the effect that great injustice was done to the retailers of petroleum in this town from the excessive charge made by the Town Council for licences for selling the same, it being two guineas in Birmingham, and only from 2*s.* 6*d.* to 5*s.* in most large towns.

"His attention was also drawn to the promised introduction of a supplementary bill for amending that Act, and exempting benzine collas, benzine, etc., from its operation.

"A reply was received that it was under the consideration of Government, but nothing more has been heard of it. It was, however, stated in one of our daily papers a few days ago that a Bill was to be introduced into the House of Lords to exempt these articles.

"The Council were also directed to arrange for a course of lectures on pharmacy to the assistants and apprentices of members during the summer months.

"In accordance with these directions, a circular was addressed to the members of the Association, inquiring as to the number that would take advantage of the same. The replies being tolerably satisfactory, arrangements were made with Dr. Hill for a course of lectures, and thirty attended the first course. A second was arranged for, but from some cause or other this was not so well attended, only eleven entering their names, resulting in a considerable loss to the Association.

"The failure of these attempts to afford practical instructions on pharmacy to our rising members is such as will, we think, prevent, at any rate for the present, a fresh movement for a like purpose.

"In December a communication was received from the Warden of Queen's College on the practicability of establishing a course of lectures on botany, pharmacy, etc., and wishing to know if any support might be expected from the Pharmaceutical Society. Some letters passed between the Council and the Pharmaceutical Society; but it being found that the Pharmaceutical Society did not intend at present to propose to subsidize any local arrangements by money grants, the proposal dropped through, mainly on the ground of the high fees named by the Queen's College.

"In January arrangements were made for the Annual Supper, but the responses to the invitations sent out were so few that it was thought advisable to postpone it. A very pleasant evening having been spent on a former occasion, it was thought that it might be a means of uniting the members of the Association more closely together, and by being oftener brought into contact with each other, of doing away with the petty jealousies that so often are the greatest bane in any profession or trade.

"Some further correspondence has taken place on the Petroleum Bill with the Pharmaceutical Society. Mr. Bremridge states that no charge is made in London for licences, and he questions if the authorities have any legal right of making any charge whatever.

"The new-elected Hon. Sec. having written to ask the favour of the Journal being sent for the use of the members of this Association, the Council of the Pharmaceutical Society kindly consented, and the Secretary has supplied all the numbers of the present series, which, when complete and bound, will make the first volume the property of the Association, and be a useful work of reference. And the weekly issue, which will continue to be sent to one of the new Hon. Secs., if it is thought practicable, could be circulated among the members.

"The general expenditure of the Association seems to have been well guarded, and, but for the large item of £23. 2*s*. 0*d*. paid to Dr. Hill, would have been very small; as it is, there remains a balance in its favour of £19. 15*s*. 2*d*.

"In conclusion, the Council submit to this meeting their second revised edition of the 'Price List,' which they believe is now pretty generally adopted in the Midland Counties; and, at the same time, they must express their regret that the efforts they have made for the establishment of classes on Pharmacy, etc. for the assistants and apprentices have not been more highly appreciated."

The election of officers for the ensuing year having taken place, a vote of thanks to the Chairman brought the proceedings to a close.

ABERDEEN ASSOCIATION OF ASSISTANT CHEMISTS AND DRUGGISTS.

At the half-yearly General Meeting of the Aberdeen Association of Assistant Chemists and Druggists, held in St. Nicholas Lane Hall, on Thursday, 25th May, the following were elected office-bearers for the next six months:—President, Mr. John Tocher; Vice-President, Mr. L. Maitland; Secretary, Mr. John Gordon; Treasurer, Mr. John Hosil; Committee, Messrs. Cassil, Farquhar, Broomhead, Fraser and Spence.

During the past session a long and varied programme has been gone through, the essays on some of the subjects showing no small ability and talent in their writers; and in addition to what the members have contributed for their mutual improvement, Mr. Ross, chemist, Castle Street, kindly added a share, by a magnificent exhibition of photographic transparencies by means of the lime light.

On the whole, in spite of manifold drawbacks, the Society still bravely fights its way onward, and strives with a steady purpose to fulfil its mission, viz. to blend in the nicest proportions the useful with the entertaining.

Proceedings of Scientific Societies.

ROYAL INSTITUTION OF GREAT BRITAIN.

The Revived Theory of Phlogiston.*

BY WILLIAM ODLING, M.B., F.R.S.,

Fullerian Professor of Chemistry, Royal Institution.

"Observationem, quam produco, bono jure mihi vindico. . . . Materia hæc ignescens, in omnibus tribus regnis, una eademque existit. Unde, ut e vegetabili in animale, abundantissime transmigrat, ita ex utrolibet horum, in mineralia et ipsa metalla, promptissime omnium transfertur."—*Stahlii Experimenta, Observationes, Animadversiones, CCC Numero.*

In 1781–83 Cavendish showed that when inflammable air, or hydrogen, and dephlogisticated air, or oxygen, are exploded together in certain proportions, "almost the whole of the inflammable and dephlogisticated air is converted into pure water," or as he elsewhere expresses it, "is turned into water."

On June 24, 1783, the experiment of Cavendish was repeated on a larger scale and in a somewhat different form by Lavoisier, who not only confirmed the synthesis of the English chemist, but drew from it the conclusion —at first strongly contested, then rapidly acknowledged, and since never called into question—"that water consists of inflammable air united to dephlogisticated air," or that it is a compound of hydrogen and oxygen.

This conclusion, so opposite to his own preconception on the matter, Lavoisier subsequently confirmed by an analysis of water. He found that iron, heated to redness and exposed to the action of water-vapour, became changed by an abstraction of oxygen from the water, into the selfsame oxide of iron procurable by burning the metal in oxygen gas,—the other constituent of the water, namely, its hydrogen, being freely liberated.

With the demonstration by Lavoisier of the composition of water began the triumph of that antiphlogistic theory, which he had conceived, in a necessarily imperfect form, so far back as 1772, or before the discovery of oxygen, and had brought to completion by the aid of every successive step in pneumatic chemistry, achieved by himself or by others.

In 1785, the relationship to one another of hydrogen and water being then conclusively established, Berthollet declared himself a convert to the new theory of combustion put forward by his countryman. Fourcroy next gave in his adhesion; and soon afterwards De Morveau, invited to Paris expressly to be reasoned with by Lavoisier, succumbed to the reasons set before him. The four chemists then associated themselves together, and in spite of a strong though short-lived opposition both in England and Germany, succeeded in obtaining for 'La Chimie Française' an all but universal recognition.

The principal articles of the new or antiphlogistic theory of combustion propounded by Lavoisier are as follows:—That combustible bodies in burning yield products of various kinds; solid in the case of phosphorus and the metals, liquid in the case of hydrogen, gaseous in the case of carbon and sulphur. That in every case the weight of the products formed by the burning is greater than the weight of the combustible burnt. That the increase of weight is due to an addition of matter furnished to the combustible by the air in which its burning takes place. That bodies of which the weights are made up of the weights of two or more distinct kinds of matter are of necessity compound; whereas bodies of which the weights cannot be shown to be made up of the weights of two or more distinct kinds of matter are in effect simple or elementary. That inas-

* Notes of a Lecture delivered at the Weekly Evening Meeting, Friday, April 28, 1871; Sir Henry Holland, Bart., M.D., D.C.L., F.R.S., President, in the chair.

much as the weights of the products furnished by the burning of different combustibles are made up of the weights of the combustible burnt and of the oxygen consumed in the burning, these products are compound bodies—oxides, in fact, of the substances burnt. That inasmuch as given weights of many combustibles, as of hydrogen, sulphur, phosphorus, carbon and the metals, are not apparently made up of the weights of two or more distinct kinds of matter, these particular combustibles are in effect elementary; as for the same reason is the oxygen with which, in the act of burning, they enter into combination. And lastly, that combustion or burning consists in nothing else than in the union of combustible matter, simple or compound, with the empyreal matter, oxygen—the act of union being somehow attended by an evolution of light and heat. And except that it would be necessary nowadays to explain how, in certain cases of combustion, the combustible enters into union, not with oxygen, but with some analogue of oxygen, the above precise statement might equally well have been made by Lavoisier in 1785 or be made by one of ourselves at the present day.

Lavoisier's theory of combustion being known as the antiphlogistic theory, the question arises, What was the phlogistic theory to which it was opposed and which it succeeded so completely in displacing? This phlogistic theory was founded and elaborated at the close of the seventeenth century by two German physicians, Beecher and Stahl. Having exercised a scarcely disputed authority over men's minds until the notorious defection in 1785, it preserved for some years longer a resolute though tortuous existence, and was to the last defended and approved by our own Priestley and Cavendish, who died, the former in 1804 and the latter in 1810.

The importance attached to the refutation of this theory may be judged of from the circumstance that after the early experiments of Lavoisier on the composition and decomposition of water had been successfully repeated by a committee of the French Academy in 1790, a congratulatory meeting was held in Paris, at which Madame Lavoisier, attired as a priestess, burned on an altar Stahl's celebrated 'Fundamenta Chemiæ Dogmaticæ et Experimentalis,' solemn music playing a requiem the while. And the sort of estimation in which the Stahlian doctrines have since been held by chemists is fairly illustrated by a criticism of Sir J. Herschel, who, speaking of the phlogistic theory of chemistry, says that it "impeded the progress of the science, as far as a science of experiment can be impeded by a false theory, ... by involving the subject in a mist of visionary and hypothetical causes in place of the true acting principles." Possibly, however, this much-abused theory may yet prove to contain an element of permanent vitality and truth; anyhow the study of this earliest and most enduring of chemical theories can never be wholly devoid of interest to chemists.

To appreciate the merit of the phlogistic theory it is necessary to bear in mind the period of its announcement. Its originator, Beecher, was born in 1625, and died a middle-aged but worn-out man in 1682, a few years before the publication of the 'Principia.' His more fortunate disciple, Stahl, who was born in 1660 and died in 1734, in his seventy-fifth year, though afforded a possibility of knowing, seems equally with Beecher to have remained throughout his long career indifferent to the Newtonian principle that the weight of a body is proportionate to its quantity of matter,—that loss of weight implies of necessity abstraction of matter, and increase of weight addition of matter. Whether or not the founders of the phlogistic theory conceived that change of matter in the way of kind, might equally with its change in point of quantity, be associated with an alteration in weight—and it must not be forgotten what pains Newton thought it necessary to take in order to show the contrary—certain it is they attached very little importance to the changes of weight manifested by bodies undergoing the metamorphoses of combustion. It might be that when combustible charcoal was burned the weight of incombustible residue was less than the original weight of charcoal,—it might be that when combustible lead was burned the weight of incombustible residue was greater than the original weight of metal; this was far too trifling an unlikeness to stand in the way of the paramount likeness presented by the two bodies. For the lead and charcoal had the common property of manifesting the wonderful energy of fire; they could alike suffer a loss of light and heat—that is, of phlogiston—by the deprivation of which they were alike changed into greater or less weights of inert incombustible residue.

And not only were these primitive students of the philosophy of combustion unconscious of the fact and meaning of the relationship in weight subsisting between the consuming and the consumed body, but they were altogether ignorant of the part played by the air in the phenomena which they so boldly and successfully attempted to explain. Torricelli's invention of the barometer and Guericke's invention of the air-pump were both indeed made during Beecher's early boyhood; but years had to elapse before the consequent idea of the materiality of air could be domiciled, as it were, in human understandings. And not until more than a century after Torricelli's discovery of the weight of air, —not, indeed, until the time of the great pneumatic chemists Black and Cavendish, and Priestley and Scheele, was it ever imagined that the aerial state, like the solid or liquid state, was a state common to many distinct kinds of matter; and that the weight or substance of a rigid solid might be largely contributed to by the weight or substance of some constituent having its independent existence in the aerial or gaseous form. The notion that 100 lbs. of smithy-scales might consist of 73 lbs. of iron and 27 lbs. of a particular kind of air, and that 100 lbs. of marble might consist of 56 lbs. of lime and 44 lbs. of another kind of air, was a notion utterly foreign to the older philosophy. Air, it was allowed, might be rendered mephitic by one kind of contamination and sulphurous by another, and inflammable by a third; it might even be absorbed in, and so add to the weight of a porous solid, as water is absorbable by sand; but still air was ever indisputably air, essentially alike and unalterable in its mechanical and chemical oneness. This familiar conception had to be overcome, and the utterly strange notion of the largely aerial constitution of solid matter to be established in its stead, by the early pneumatic chemists, Black and Cavendish and Bergmann, before the deficiencies rather than positive errors of the phlogistic theory could be perceived.

But long ere the foundation of modern chemistry had thus been laid, in 1756, by Black's discovery of fixed air or carbonic acid as a constituent of mild alkalis and limestone, those old German doctors, Beecher and Stahl, though ignorant of the nature of air and neglectful of the import of gravity, had yet found something to say about the chemistry of combustion worthy of being defended a century afterwards by men like Priestley and Cavendish,—worthy, it is believed, of being recognized nearly two centuries afterwards as the expression of a fundamental doctrine in chemical and cosmical philosophy. They pointed out, for example, that the different and seemingly unlike processes of burning, smouldering, calcining, rusting, and decaying, by which combustible is changed into incombustible matter, have a community of character; that combustible bodies possess in common a power or energy capable of being elicited and used, whereas incombustible bodies are devoid of any such energy or power; and lastly, that the energy pertaining to combustible bodies is the same in all of them, and capable of being transferred from the combustible body which has it to an incombustible body which has it not, rendering the body that was energetic and combustible inert and incombustible, and the body that was inert and incombustible energetic and combustible,—and further rendering some particular body combustible over and over again. That this is a fair representation of the views held by phlogistic chemists is readily recognizable by a study of chemical works written before the outbreak of the antiphlogistic revolution. After Lavoisier's challenge, the advocates of phlogiston, striving to make it account for a novel order of facts with which it had little or nothing to do, were driven to the most incongruous of positions; for while Priestley wrote of inert nitrogen as phlogisticated air, Kirwan and others regarded inflammable hydrogen as being phlogiston itself in the isolated state. Very different is the view of phlogiston to be gathered from the writings of Dr. Watson, for example, who was appointed Professor of Chemistry at Cambridge in 1764, became Regius Professor of Divinity in 1771, and Bishop of Llandaff in 1782. This cultivated divine, indifferent it is true to the novel questions by which in less placid regions men's minds were so deeply stirred, amused the leisure of his dignified university life by writing scholarly accounts of the chemistry it had formerly been his province to teach; and in the first volume of his well-known 'Chemical Essays,' published in 1781, the following excellent account of phlogiston is to be found:—

"Notwithstanding all that perhaps can be said upon this subject, I am sensible the reader will still be ready to ask, *What is phlogiston?* You do not surely expect that chemistry should be able to present you with a handful of phlogiston, separated from an inflammable body; you may just as reasonably demand a handful of magnetism, gravity, or electricity to be extracted from a magnetic, weighty, or electric body. There are powers in nature which cannot otherwise become the objects of sense, than by the effects they produce; and of this kind is phlogiston. But the following experiments will tend to render this perplexed subject somewhat more clear.

"If you take a piece of *sulphur* and set it on fire, it will burn entirely away, without leaving any ashes or yielding any soot. During the burning of the sulphur, a copious vapour, powerfully affecting the organs of sight and smell, is dispersed. Means have been invented for collecting this vapour, and it is found to be a very strong acid. The acid thus procured from the burning of sulphur, is incapable of being either burned by itself, or of contributing towards the support of fire in other bodies: the sulphur, from which it was procured was capable of both: there is a remarkable difference, then, between the acid procured from the sulphur and the sulphur itself. The acid cannot be the only constituent part of sulphur; it is evident that *something* else must have entered into its composition, by which it was rendered capable of combustion. This something is, from its most remarkable property, that of rendering a body combustible, properly enough denominated the food of fire, the *inflammable principle, the phlogiston*. . . . . This inflammable principle, or phlogiston, is not one thing in animals, another in vegetables, another in minerals; it is absolutely the same in them all. . . . . This identity of phlogiston may be proved from a variety of decisive experiments; I will select a few, which may at the same time confirm what has been advanced concerning the constituent parts of sulphur.

"From the analysis or decomposition of sulphur effected by burning, we have concluded that the constituent parts of sulphur are two—an *acid* which may be collected, and an *inflammable principle* which is dispersed. If the reader has yet acquired any real taste for chemical truths, he will wish to see this analysis confirmed by synthesis; that is, in common language, he will wish to see sulphur actually made by combining its acid with an inflammable principle. It seldom happens that chemists can reproduce the original bodies, though they combine together all the principles into which they have analysed them; . . . . . in the instance, however, before us, the reproduction of the original substance will be found complete.

"As the inflammable principle cannot be obtained in a palpable form separate from all other bodies, the only method by which we can attempt to unite it with the acid of sulphur must be by presenting to that acid some substance in which it is contained. Charcoal is such a substance; and by distilling powdered charcoal and the acid of sulphur together, we can procure a true yellow sulphur, in nowise to be distinguished from common sulphur. This sulphur is formed from the union of the acid with the phlogiston of the charcoal; and the charcoal may by this means be so entirely robbed of its phlogiston, that it will be reduced to ashes, as if it had been burned. . . . .

"I will in this place, by way of further illustration of the term phlogiston, add a word or two concerning the necessity of its union with a metallic earth, in order to constitute a metal. Lead, it has been observed, when melted in a strong fire, burns away like rotten wood; all its properties as a metal are destroyed, and it is reduced to ashes. If you expose the ashes of lead to a strong fire, they will melt; but the melted substance will not be a *metal*, it will be a yellow or orange-coloured *glass*. If you pound the glass, and mix it with charcoal dust, or if you mix the ashes of the lead with charcoal dust, and expose either mixture to a melting heat, you will obtain, not a *glass*, but a *metal*, in weight, colour, consistency and every other property the same as lead. The ashes of lead melted *without* charcoal become *glass;* the ashes of lead melted *with* charcoal become a *metal*. The charcoal, then, must have communicated *something* to the ashes of lead, by which they are changed from a glass to a metal. Charcoal consists of but two things—of ashes and of phlogiston; the ashes of charcoal, though united with the ashes of lead, would only produce glass; it must therefore be the other constituent part of charcoal, or phlogiston, which is communicated to the ashes of lead, and by an union with which the ashes are restored to their metallic form. The ashes of lead can never be restored to their metallic form without their being united with *some* matter containing phlogiston, and they may be reduced to their metallic form by being united with *any* substance containing phlogiston in a proper state, whether that substance be derived from the animal, vegetable, or mineral kingdom; and thence we conclude not only that phlogiston is a necessary part of a metal, but that phlogiston has an identity belonging to it, from whatever substance in nature it be extracted. And this assertion still becomes more general, if we may believe that metallic ashes have been reduced to their metallic form, both by the solar rays and the electrical fire."

The foregoing account by Dr. Watson is almost a translation from Stahl's 'Zymotechnica Fundamentalis, simulque experimentum novum sulphur verum arte producendi,' in which he establishes what may be called the permanency of chemical substance,—that metallic lead is reproducible from the ashes of lead, *sulphur verum* from the acid of sulphur. And, whether or not taking note of the oxidations and deoxidations effected, how little differently, even at the present day, would the actions referred to be described and explained! Is it not our habit to say that charcoal and sulphur and lead are bodies possessing potential chemical energy, that is phlogiston; that in the act of burning, their energy which was potential becomes kinetic or dynamical, and is dissipated in the form of light and heat; that the products of their burning (including the gaseous product now known to be furnished by the burning of charcoal) are substances devoid of chemical energy, that is, of phlogiston; that when the acid substance furnished by burning sulphur is heated with charcoal, some energy of the unburnt charcoal is transferred to the burnt sulphur, just as some energy of a raised weight may be transferred to a fallen one, whereby the burnt sulphur is unburnt, provided with energy, and enabled to burn again, and the fallen weight is lifted up, provided with energy, and enabled to fall again; that the potential chemical energy of metallic lead did not originate in the lead, but is energy or phlogiston transferred thereto from the charcoal by which it was smelted; and, lastly, that the chemical energy of the charcoal itself, its capability of burning, its power of doing work,—in one word, its phlogiston is merely a portion of energy appropriated directly from the solar rays?

If this be a correct interpretation of the phlogistic doctrine, it is evident that the Stahlians, though ignorant of much that has since become known, were nevertheless cognizant of much that became afterwards forgotten. For most of what has since become known, mankind are indebted to the surpassing genius of Lavoisier; but the truth which he established, alike with that which he subverted, is now recognizable as a partial truth only; and the merit of his generalization is now perceived to consist in its addition to—its demerit to consist in its supersession of—the not less grand generalization established by his scarcely remembered predecessors. This being so, the relationship to one another of the Stahlian and Lavoisierian theories of combustion furnishes an apt illustration of the general truth set forth by a great modern writer, that "in the human mind one-sidedness has always been the rule, and many-sidedness the exception. Hence, even in revolutions of opinion, one part of the truth usually sets while another rises. Even progress, which ought to superadd, for the most part only substitutes one partial and incomplete truth for another; improvement consisting chiefly in this, that the new fragment of truth is more wanted, more adapted to the needs of the time, than that which it displaces."

The partial truth contributed by Lavoisier was indeed more wanted, more adapted to the needs of the time, than the partial truth which it displaced. To him chemists are indebted for their present conception of material *elements*; and especially for their knowledge of the part played by the air in the phenomena of combustion, whereby oxygenated *compounds* are produced. The phlogistians, indeed, were not unaware of the necessity of air to combustion, but, being ignorant of the nature of air, were necessarily ignorant of the function which it fulfilled. To burn and to throw off phlogiston being with them synonymous expressions, the air was conceived to act by somehow or other enabling the combustible to throw its phlogiston off; and a current of air was conceived to promote combustion by enabling the combustible to throw its phlogiston off more easily. Moreover, contact of air was not essential to combustion, provided there was present instead some substance, such as nitre, which equally with, or even more effectively than air, could enable the combustible to discharge itself of phlogiston. But while the phlogistians, on the one hand, were unaware that the burnt product differed from the original combustible otherwise than as ice differs from water, by loss of energy; Lavoisier, on the other hand, disregarded the notion of energy, and showed that the burnt product included not only the stuff of the combustible, but also the stuff of the oxygen it had absorbed in the burning. But, as well observed by Dr. Crum-Brown, we now know "that no compound contains the substances from which it was produced, but that it contains them *minus* something. We now know what this something is, and can give it the more appropriate name of potential energy; but there can be no doubt that this is what the chemists of the seventeenth century meant when they spoke of phlogiston."

Accordingly, the phlogistic and antiphlogistic views are in reality complementary, and not, as suggested by their names and usually maintained, antagonistic to one another. It has been said, for example, that, according to Stahl, the product of combustion is simple, and the combustible a compound of the product with imaginary phlogiston, which is false; whereas, according to Lavoisier, the combustible is simple, and the product a compound of the combustible with actual oxygen, which is true. But in this case, as in so many others, everything turns upon the use of the same word in a different sense at different periods of time. When Lavoisier spoke of red lead as being metallic lead combined with oxygen, he meant that the matter or stuff of the red lead consisted of the matter or stuff of lead *plus* the matter or stuff of oxygen. But when the Stahlians spoke of metallic lead being burnt lead combined with phlogiston, they had the same sort of idea of combination in this instance as others have expressed by saying that the weight of a body is compounded of its matter and its gravity; or that steam is a compound of water and heat; or, to use a yet more Lavoisierian expression, that oxygen gas itself is a compound of the basis of oxygen with caloric. It is not, then, that the one statement, Stahlian or Lavoisierian, is false and the other true, but that both of them are distorted, because incomplete. Chemists nowadays are both Stahlian and Lavoisierian in their notions; or have regard both to energy and matter. But Lavoisierian ideas still interfere very little with our use of the Stahlian language. While we acknowledge that in the act of burning the combustible and the oxygen take equal part, just as in the act of falling the weight and the earth take equal part, yet in our common language we alike disregard the abundant atmosphere and abundant earth as being necessarily understood, and speak only of the energy of the combustible and of the weight, which burn and fall respectively. Whatever may be the fault of language, however, chemists do not omit to superpose the Lavoisierian on the Stahlian notion. They recognize fully that it is by the union of the combustible with oxygen that phlogiston is dissipated in the form of heat; and further, that phlogiston can only be restored to the burnt combustible on condition of separating the combustible from the oxygen with which it has united; just as energy of position can only be restored to a fallen weight on condition of separating it to a distance from the surface on which it has fallen.

That Stahl and his followers regarded phlogiston as a material substance, if they did so regard it, should interfere no more with our recognition of the merit due to their doctrine, than the circumstance of Black and Lavoisier regarding caloric as a material substance, if they did so regard it, should interfere with our recognition of the merit due to the doctrine of latent heat. But though defining phlogiston as the principle or matter of fire, it is not at all clear that the phlogistians considered this matter of fire as constituting a real body or ponderable substance; but rather that they thought and spoke of it as many philosophers nowadays think and speak of the electric fluid and luminiferous ether. The nondescript character, properly ascribable to phlogiston, is indicated by the following quotation taken from Macquer's 'Elémens de Chymie Théorique,' 1749. It must not, of course, be forgotten that the popular impression as to phlogiston having been conceived by its advocates as a material substance having a negative weight or levity, is erroneous; and is based on an innovation that was introduced during the struggling decadence of the phlogistic theory, and advocated more particularly by Lavoisier's subsequent colleague, Guyton de Morveau, in his 'Dissertation sur le Phlogistique, considéré comme Corps grave, et par rapport aux changemens de pesanteur qu'il produit dans les corps auxquels il est uni,' 1762. Macquer writes as follows:—

"La matière du soleil, ou de la lumière, le phlogistique, le feu, le soufre principe, la matière inflammable, sont tous les noms par lesquels on a coutume de désigner l'élément du Feu. Mais il paroît qu'on n'a pas fait une distinction assez exacte . . . . du nom qu'il mérite véritablement lorsqu'il entre effectivement comme principe dans la composition d'un corps, ou bien lorsqu'il est seul et dans son état naturel. Si on l'envisage sous cette dernière vue, le nom de Feu, de matière du soleil, de la lumière et de la chaleur, lui convient particulièrement. Pour lors, c'est une substance que l'on peut considérer comme composée de particules infiniment petites, qui sont agitées par un mouvement très-rapide et continuel, par conséquent essentiellement fluide. Cette substance, dont le soleil est comme le réservoir général, s'en émane perpétuellement, et est répandue universellement dans tous les corps que nous connoissons; mais non pas comme principe ou essentielle à leur mixtion, puisqu'on peut les en priver, du moins en grande partie, sans qu'ils souffrent pour cela la moindre décomposition. . . . Cependant les phénomènes que présentent les matières inflammables lorsqu'elles brûlent, nous indiquent qu'elles contiennent réellement la matière du Feu comme un de leurs principes. . . . Examinons donc les propriétés de ce feu fixé, et devenu principe des corps. C'est lui auquel nous donnerons particulièrement le nom de matière inflammable, du soufre principe, ou de Phlogistique, pour le distinguer du Feu pur."

Again, much the same thing is to be found in Baumé's 'Manuel de Chymie,' 1765: as for example:—

"Nous considérons le feu sous deux états différens. Lorsqu'il est pur, isolé, et qu'il ne fait partie d'aucun composé . . . . Lorsqu'il est combiné avec d'autres substances, et qu'il fait un des principes constituans des corps composés . . . . On n'est pas certain si le feu est pesant. Il y a des expériences pour et contre. . . .

"Pendant la combustion des substances, le feu combiné se réduit en feu élémentaire, et se dissipe à mesure. Le célèbre Boerhaave n'est cependant pas de ce sentiment; il dit que si cela étoit, la quantité de feu élémentaire devroit augmenter à l'infini dans la nature. . . . Mais il est facile de répondre à cette objection, en disant comme on est en droit de le présumer, que le feu élémentaire, dégagé des corps, se combine à mesure avec d'autres substances, et qu'il perd toutes ses propriétés de feu libre, en devenant principe constituant des corps, dans la composition desquels il entre. . . . Le principe dont nous entendons parler ici, est celui que Stahl a nommé *phlogistique*."

In interpreting the above and other phlogistic writings by the light of modern doctrine, it is not meant to attribute to their several authors the precise notion of energy that now prevails. It is contended only that the phlogistians had, in their time, possession of a real truth in nature which, altogether lost sight of in the intermediate period, has since crystallized out in a definite form. "I trust," said Beecher, "that I have got hold of my pitcher by the right handle." And what he and his followers got hold of and retained so tenaciously, though it may be shiftingly and ignorantly, we now hold to knowingly, definitely and quantitatively, as part and parcel of the grandest generalization in science that has ever yet been established.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting of Executive Committee at 17, Bloomsbury Square.

May 16*th*, 1871.

Present—Messrs. Williams (in the chair), Brady, Carteighe, Groves, Mackay, Martindale, Matthews, Schacht, Attfield and Reynolds (Secretaries), and Collins (Assistant-Secretary).

'*Year Book of Pharmacy for* 1871.'—Arrangements were made for printing and publishing the second annual volume in the autumn of the present year.

Distribution of the 'Year Book.'—After due deliberation, and the consideration of opinions expressed by several local secretaries, the Committee resolved to distribute the next 'Year Book' by post only. The Secretaries were instructed, in collecting the annual subscription of five shillings, to ask for an additional sixpence to cover cost of delivery of the volume, and to request all members to accept this rule in order to avoid the expense of salaries to clerks and messengers. The Committee considered that by thus devoting nearly the whole of the funds to the production of the 'Year Book,' a complete, efficient and inexpensive manual would be obtained, which would always be found to be indispensable as a desk companion for the year, and an invaluable permanent work of reference for every chemist and druggist.

Presentation Copies of the 'Year Book.'—The Secretaries reported that sixteen books had been sent to the leading libraries and journals of pharmacy in Europe and America. Resolved, that a copy be forwarded to every English provincial Pharmaceutical Association possessing a library.

The "Bell and Hills" Fund.—The Secretaries stated that ten guineas' worth of books had been presented to the library of the Chemists' Association at Liverpool, and had been duly acknowledged.

New Members.—In view of the continuous annual publication of the 'Year Book,' the Secretaries were ordered to issue a circular, requesting every member to obtain one or more new members, and otherwise to endeavour to increase the numerical strength of the Conference.

Candidates for Membership.—The following were elected members of the Conference:—

Anderson, J., Edinburgh; Babtie, J., Dumbarton; Baker, A. P., London; Baker, F. B., London; Barratt, J., London; Berry, W., Bristol; Birch, H. C., London; Brearey, W. A., Isle of Man; Brodie, R., Glasgow; Buchanan, D., Greenock; Buchanan, Dr. J. D., Glasgow; Button, J., Rangoon; Clarke, A. H., London; Colclough, W., London; Collett, C. B., Exeter; Cowan, Professor, Glasgow.; Cuff, R. C., Bristol; Dunn, J., Selkirk; Evans, D. O., Halstead; Evans, W., Liverpool; Fairgrieve, T., Edinburgh; Fowler, W. R., Spilsby; Fraser, J., Inverness; Gilmour, W., Edinburgh; Griffith, R., Slough; Hammond, C. T., Hull; Hart, J., Manchester; Hart, W., Bolton; Hartley, W., St. Andrews; Henderson, W. P., Dundee; Hewitt, G., Kidderminster; Hodgkinson, W., London; Hothersall, J., Bolton; Hughes, J. T., Altrincham; Hurst, J. B., Louth; Jackson, A. H., Manchester; Jackson, J. P., London; Johnson, A., Rotherham; Jones, M., Flint; Laird, G. H., Edinburgh; Leigh, J. J., Bishop Auckland; Longley, G., Stockport; Mackenzie, —, Glasgow; Mackenzie, J., Edinburgh; Mackey, —, London; Mackill, R. C., Hamilton; Macpherson, A., Stornoway; Maitland, J. E., London; Maxwell, G. N., Northampton; Mitchin, F., London; Moffatt, Dr. R. C., Glasgow; Napier, A., Edinburgh; New, T. C., Manchester; Niven, W., Edinburgh; Paine, C., Wrexham; Palmer, A. N., Bury St. Edmunds; Parkin, C., Doncaster; Pasmore, G., Portsmouth; Peake, H. F., Twickenham; Peters, J., London; Pond, B. C., London; Porrett, G. W., Scarborough; Pote, S. R., Exeter; Prince, A. G., Longton; Procter, Dr. W., York; Sang, E., Edinburgh; Selkirk, J., Edinburgh; Slater, W. H., Romsey; Smith, A., Edinburgh; Stewart, J., Hamilton; Swift, F., Spalding; Symons, W., Barnstaple; Taylor, C., Liverpool; Taylor, W., Heywood; Taylor, W. G., Nuneaton; Vennall, G., Cranleigh; Warrior, H., Northallerton; Williams, R., Manchester; Woodburn, Dr. J. C., Glasgow; Woolley, G., Nottingham; Wynne, E. P., Stratford-on-Avon; Young, P., Dundee.

CHEMICAL SOCIETY.

May 18*th.*—Professor Frankland, F.R.S., President, in the chair. Messrs. T. Greenish and J. E. Mayall were elected Fellows. The following papers were read:— "On a New Double Salt of Thallium," by R. J. Friswell. The author, wishing to prepare platinocyanide, mixed hot solutions of thallic carbonate and potassic platinocyanide, and obtained, on leaving the mixture to cool, masses of splendid crystals, which appeared by transmitted light of a magnificent crimson-red, whilst their reflected colour was a bronzy green of strong metallic lustre. Analysis showed that they are a compound of thallic carbonate with thallic platinocyanide $Tl_2PtCy_4, COTlo_2$. On treating this salt with acids, carbonic acid is set free, and a pale pink residue left, which, on examination, was found to be thallic platinocyanide. The next paper read was "On the Action of Nitric Acid on Dichlorophenolsulphuric Acid," by Dr. Armstrong.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY ...*London Institution*, at 2 P.M.—Distribution June 7. of Prizes and Certificates by the President, Thomas Baring, Esq., M.P.

FRIDAY ....*Quekett Club*, at 8 P.M.

June 9. *Royal Botanic Society*, at 4 P.M.—"Economic Botany." By Professor Bentley.

SATURDAY ......*Royal Botanic Society*, at 3.45 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. Edwin Foy has been appointed Dispenser at her Majesty's Prison at Dartmouth.

Parliamentary and Law Proceedings.

POISONING BY PRUSSIC ACID.

On Tuesday, an inquiry was held at St. George's Hospital respecting the death of Mr. Russell Goldie, the secretary and superintendent of the institution. It appeared from the evidence adduced that the deceased had been in the habit of taking prussic acid to allay a certain pain from which he was suffering. On Sunday morning he went up to his room in the hospital. He said he was unwell, and complained of a pain in the side. After drinking a cup of tea, he lay down on the couch and said he did not wish to be disturbed. About two o'clock in the afternoon the assistant secretary found him lying on the couch quite cold and dead. On the table was a bottle which had contained prussic acid and camphor. Mr. John F. Boyes, Gloucester Crescent, Regent's Park, said he had known deceased for many years. When he had been with him he had often thought his breath smelt of prussic acid or laudanum. Witness had charged him, as a friend, with taking prussic acid, and deceased on one occasion said, "My dear friend, if you suffered the pain I do, you would be glad enough to take anything to allay it." Mr. Thomas Jones, resident medical officer of the hospital, said he saw the deceased alive on Saturday. He then appeared very nervous and excited, and said to witness the cause of his condition was through certain annoyance and the hospital work. He died from the effects of prussic acid. The coroner having summed up, the jury returned a verdict that the deceased was accidentally poisoned by taking an overdose of prussic acid.

The following journals have been received:—The 'British Medical Journal,' May 27; the 'Medical Times and Gazette,' May 27; the 'Lancet,' May 27; the 'Medical Press and Circular,' May 31; 'Nature,' May 27; the 'Chemical News,' May 26; 'Gardeners' Chronicle,' May 27; 'Journal of the Society of Arts,' May 27; the 'Grocer,' May 27; 'Produce Markets Review,' May 27; the 'English Mechanic,' May 27; 'Journal of the Chemical Society' for May; the 'Canadian Pharmaceutical Journal' for May; the 'Chicago Pharmacist' for May; the 'Leavenworth Medical Herald and Journal of Pharmacy' for May; the 'British Journal of Dental Science' for June.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

BORAX AND BLACKBEETLES.—We have received a considerable amount of correspondence upon the question whether the use of borax as a beetle-powder is followed by the extirpation of those household pests. Most of our correspondents deny its efficacy. Professor Tomlinson, to whose letter, under the signature of "*T.*," we in a recent number appended a note pointing out that there was diversity of opinion upon the subject, informs us that he tried the recommendation of *H. C. B.*, and sprinkled powdered borax in the haunts of the beetles, but without success. He therefore resolved to decide the matter by experiment upon a captured blackbeetle, particulars of which he has kindly forwarded to us. The conclusions at which he arrived were—"(1) that powdered borax is not a poison to the blackbeetle; (2) that it does not act by any supposed odour on the beetle,—the beetle, on the contrary, gives a powerful odour to the borax and to his prison-house; (3) the pounded borax does seem to annoy the beetle by its mechanical action, clinging to his limbs and making him uncomfortable; (4) the beetle is under no permanent delusions as to the powdered borax—he tasted it and did not like it, he got it about his person and cleaned it off, and avoided it as far as his narrow prison would allow. In conclusion, I must express my opinion that powdered borax is quite useless in getting rid of blackbeetles."

Another correspondent ("*Obrera*"), who has experimented with borax and found it inefficacious, has also tried red lead, flour and sugar without result, in consequence, he thinks, of the beetles declining to eat the mixture. He says that a mixture of strong ammonia with two or three times its bulk of hot water has a very quick effect. He has known a large beetle to be killed by receiving two or three drops of it on the head. He suggests that the solution should be injected late at night through the crannies which the beetles are known to traverse. He has not found liquid carbolic acid to have much effect upon them; but the carbolic acid powder seems to clog their feet, and permit the vapour to reach their brain organism before they can escape from it.

On the other hand, "*A Country Chemist*" writes:—"A grocer in this city about two years since, having great numbers of these pests about his premises, tried various articles which we were then selling as 'beetle poisons,' but with little beneficial result. Upon the recommendation of a wholesale biscuit manufacturer, who assured him that powdered borax kept their place quite clear of these vermin, he purchased an ounce of me, which he found to be a certain cure. We, therefore, tried it on our own premises, and, finding it to answer, have ever since sold it as 'beetle powder' without a single complaint against its efficacy."

"*Give and Take*," whose query has brought forth such differences of opinion, suggests that the question of the best way to exterminate these and similar household pests is worthy of more attention than it has hitherto received, especially from those who are students in the science of entomology. Our correspondent seems to complain that, by the use of the word "borax" instead of "sodæ biboras," in our 'Notes and Queries' column, we have enabled other journals to publish what, if it had been what it professed to be, ought to have been regarded somewhat in the light of a trade secret. Even if we were prepared to endorse such an opinion,—which would be equivalent to supposing that none but chemists know that the terms are synonymous,—we could not plead guilty to the charge, as the paragraph which has been going the round of the papers was taken from an American source, and generally acknowledged as such.

[231.]—BEETLE POWDER.—I have found that common red wafers, such as are used for letters, placed in the haunts of beetles, are very useful in getting rid of these troublesome pests. I have also successfully used a mixture of plaster of Paris and oatmeal, equal parts, and about one-fourth of sugar.—J. N. M.

Correspondence.

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

The Benevolent Fund.

Sir,—I was much surprised to see that a suggestion had been made at the annual meeting that "it would be advantageous to add a separate column to the Calendar, showing the subscription, or lack of subscription, of each of the members" to the Benevolent Fund. It is a fertile idea, and might be worked by promoters of local charities and sectarian leaders until all spontaneity were eliminated from our charity and our giving became a mere matter of coercion. Surely the asterisks of the Calendar are all that—if not somewhat more than—could be desired. To me it is questionable what moral right any person has to advertise my not subscribing to any particular charity. Whence the authority of the censors?

To the utmost I would support the proposition that it is the duty of every man to devote a liberal portion of his income to charitable purposes; but I would equally oppose the interference of any one in the manner of its allocation. No man should be branded for electing to be the almoner of his own bounty.

Charity is such an evident outflow of Christianity that it is difficult to discuss any branch of it without recalling the admonition of its Founder that "alms should be in secret." In this spirit the suggestion might, perhaps, be tolerated that, while it is highly desirable that subscribers should increase their subscriptions, and that every member should become a subscriber, it is not advisable that any names should be published.

Is there so little of principle and so much of policy in our giving that a half-crown subscription must be published all over the country? In modern times we have so improved upon the ancient sect that we "sound the trumpet" of our promises before us and advertise our subscriptions afterwards. We no longer "do good by stealth," nor "blush to find it fame." Henricus.

May 22nd, 1871.

Poison Regulations.

Sir,—When the Council agreed to submit the poison regulations as a code for voluntary adoption, a "tacit understanding" arose that they would not be submitted to the vote of the meeting as a compulsory code. I need not say more, for those who have read your last number know all the rest.

Barnard S. Proctor.

Sir,—I was apprenticed in the country, the business a mixed wholesale and retail. I have lived in situations both in country and town I have been in my present house thirty years, and have been connected with the Pharmaceutical Society from the year of its formation, but cannot recollect a single case of poisoning that would not have been prevented by the most simple precaution.

Education will give knowledge of drugs and doses, but will not prevent absence of mind. It is reported of one of our greatest men that, instead of applying his lady's hand to his lips, he once used the little finger of it as a tobacco-stopper. The best, because the most simple, precaution that I have read of, is a band of colour, equally applicable to the most carefully conducted dispensing establishment or the most carelessly kept country warehouse; in the one case by a solution of sealing-wax in spirit round the neck and under the lip of the bottle, and in the other by a paint brush round the top of the arsenic cask. We should not again hear of arsenic being substituted for gypsum in lozenges, or strychnia for salicin in powders. I voted yesterday for the "recommendations" of the Council being made "regulations," but I fear if they become law this plan becomes illegal, as the bottles, etc., are neither tied over, capped or locked, rendered distinguishable by touch or necessarily kept apart. I should regret this, and therefore make my remonstrance while it is still open to the Council to consider it.

J. M. Hucklebridge.

116, *Ebury Street, Eaton Square, S.W.*,
May 18th, 1871.

The Register of Chemists and Druggists.

Sir,—As Mr. Wiggin, who addresses a question to me in this week's Journal, was present at the meeting when I made the statement the accuracy of which he doubts, I regret he did not save his own as well as my time by putting the query then; had he done so, I should have felt great pleasure, with the kind permission of our "active Registrar," in giving him ocular demonstration that I had not made an assertion I was unable to substantiate. If Mr. Wiggin will, on his next visit to Bloomsbury Square, ask our mutual friend the "active Registrar" for a view of returned circulars, his incredulity will, I think, at once be put to flight.

As Mr. Wiggin is evidently anxious that, so far as Ipswich at least is concerned, all matters should be found correct, I venture to draw his attention to one oversight on his part, which doubtless he will take an early opportunity of rectifying. I refer to the utmost entire absence of Ipswich from the list of contributors to the Benevolent Fund. Should the Council think well to adopt my suggestion of publishing the subscriptions against each name in the Calendar, I regret to say Mr. Wiggin and his charge would be found wanting.

As Mr. W. may be anxious to know my authority for stating this fact, I refer him to the Calendar of the Pharmaceutical Society for 1871, and to the Pharmaceutical Journal of the 13th instant. Edwin B. Vizer.

63, *Lupus Street, Belgravia South*,
May 27th, 1871.

The late Election of Council.

Sir,—Will you permit me, through your columns, very sincerely to thank the 719 members who recorded their votes in my favour at the Annual Meeting on the 17th inst. The result is highly satisfactory to me, being only three votes below Mr. Sandford, the late President. I should have been exceedingly sorry to have displaced that gentleman, and thereby deprive the Society of his valuable services. I trust, however, at some future time, to have a seat on the Council, when I shall have more time and leisure to attend to its important duties.

In the meantime, let me urge on the great body of chemists to secure at least the return of two or three of their number to represent them on the Council.

John Owen.

234, *Upper Street, Islington, London, N.*

Pharmaceutical Examinations.

Sir,—Your correspondent, Mr. P. H. Mason, asks some one to inform him what advantage is gained by passing the Major Examination besides the honour of the thing? I will attempt to answer him. In the first place, Mr. M. allows that the title Fellow would be compensation enough, thus proving that it is no direct monetary advantage that he alludes to. With this premise, by stating my own case, I think I shall effect my proof. Having lately passed the Examination alluded to with honours, although in studying for it I have only learnt enough to teach me my ignorance of the great field of knowledge beyond, yet I have gained the title of Pharmaceutical Chemist, with a diploma stating to the public that it was obtained by examination, which title will yearly be of more value, as those who have obtained it otherwise are passing away. Also, I obtained the privilege of becoming a member of the Society, giving me the power of voting at the General Meeting, etc., which privilege I have recently availed myself of; and, thirdly, when I set up in business, I expect to prosper beyond what I should have done with only my Minor qualification. Believing, Sir, that these inducements are quite sufficient to urge young men to push on to the Major, I see no need for the title of Fellow, which would but add another to the long list that already confuses the public mind. If we who have lately passed it do not obtain from the public all the respect we would have them give to it, yet the day is coming when the young pharmacist will enjoy a very superior position to the chemist and druggist.

M. P. S.

Sir,—I fully agree with "B. S." that the man who has passed the Modified Examination should be eligible for the Minor. I myself, knowing I must pass the Modified before January, 1870, or be shut out from the Society altogether, hastened to do so, fully intending, at a future time, to present myself for the Minor, and lastly the Major; but finding by the bye-laws I am debarred this opportunity, I, with many others, shall remain a Modified man, unless the Council shall alter the bye-laws, and allow the man who has passed the Modified to present himself for the Minor Examination. Should they do so, it would not only greatly increase the number of Pharmaceutical Chemists and interests of the Society, but meet the requirements of the many and not the few of the Modified men.

FORWARD.

THE DRUGS SUPPLIED BY SURGEONS.

Sir,—In reading the account of the inquest on the body of the child Bruce Logan, at Steeple Claydon, Bucks, I was surprised at the following part of the evidence:—

It was stated that a day or two before the murder the accused woman Muir obtained some "laudanum" at a surgeon's, which was served in his absence by his "wife," and was not labelled "poison." Afterwards, however, that lady called and stated that as the laudanum was stronger than was usually sold by druggists her husband wished to have it labelled.

Now, although surgeons are not subject to the same pains and penalties that we druggists are for selling poisons without a label, I think it hardly fair for them to cover their assistants' carelessness by a reflection upon the strength of our drugs. That this statement was, on the part of the surgeon, a palpable misrepresentation seems evident; and I certainly do not think that the experience of druggists will tend to establish the fact that the drugs used by surgeons are of superior quality to our own. For my own part, I have seen too frequently to the contrary. In bringing this matter before the notice of your correspondents, I am anxious to know their views upon the subject.

May 20th, 1871. A LOVER OF TRUTH.

THE EARLY CLOSING QUESTION.

Sir,—You were kind enough to find space in your valuable Journal for a letter written by me some months ago proposing the establishment in Brighton of a school of pharmacy. I am sorry to say that out of the many chemists we have here, not one would second my proposal. So much for their public spirit. My present purpose, however, is to request you to be kind enough to grant me space for a few remarks on 'early closing.' I quite sympathize with my brother assistants as to the long hours we day by day endure. Why cannot the servants who receive their orders from their mistresses early in the morning deliver them to the chemist within reasonable hours? Instead of this they lay prescription and bottle on the dresser-shelf, and there they let them remain until they go out dressed, at seven or eight o'clock (and even later) in the evening. Thus their pleasure becomes our pain. They leave their orders at this late hour and coolly request that they may be made up and sent home immediately. It may be that it is Missis' night draught and she can't go to bed without it, and so on; such messages are quite an every-day affair here. Sometimes I employ a little gentle remonstrance, but am frequently told (in anything but polite terms), "Do you think I was going to come up with it on purpose, when Missis doesn't want it till she goes to bed?"

Some evenings I have counted from fifteen to twenty prescriptions delivered by servants after eight o'clock to be dispensed that same night, nearly all of which might have been brought in earlier in the day. During my experience in Brighton I cannot remember one instance where a lady has brought a prescription after dusk, unless it be a newly-written one. But as long as servants know our shops are kept open till ten or eleven o'clock at night for general retail, we shall be martyrs to long hours. The proprietors do not suffer, only the assistants. The proprietors have no more examinations to pass, nor do they wish to. They are already registered and in business. The assistant, on the other hand, before he can call himself a chemist and druggist and go into business, must pass an examination. How can he study? What time has he? He is mixing up scammony and jalap from 7.30 A.M. till 10.30 P.M. Can he be expected to study Attfield's 'Chemistry,' Bentley's 'Botany' and his Latin 'Delectus' after these late hours?

After all, Sir, I think you will agree with me that there is a great deal of human nature in the chemist's assistant, and that he ought not to be expected to do so very much above and beyond other men. Let our hours be from eight to eight, and then we shall be able to find time for two hours' study, night and morning. No one, of course, will ever grumble to dispense a prescription for any emergency or accident after the prescribed hours. When the public know the time for closing, they will purchase their ounce of salts or pennyworth of hair-oil before eight, as they now do before ten o'clock.

A. H. A., JUN.

Cliftonville, Brighton, May 16th, 1871.

DRUGGISTS' PRICES.

Sir,—The "prices" question is ever again and again cropping up in the Journal; but agitate as we will, the end at which we aim will be delayed indefinitely so long as we have members of the trade meeting in committee and drawing up "price lists," in which the prices of ℥i, ℥iss and ℥ij mixtures are appraised at 4*d.* 6*d.* and 8*d.* respectively. These prices actually appear in a list drawn up by our friends north of the Tweed, in which, by the way, though there is some flourish about "your committee," etc., everything that might indicate its origin is suppressed,—printer's name and address included.

Fourpence for eight doses of medicine! How much is left for the "skilled labour," after deducting 2½*d.* for bottle, cork, labels, paper, etc. On whatever sum can one "live and keep up appearances" in the "land of cakes"?

Bradford, May 20th, 1871. R. G. H.

Sir,—There has been a great deal said lately in the PHARMACEUTICAL JOURNAL about various prices in different towns. A week or two since, when visiting Bristol, I found there was a chemist in that town advertising articles at such very low prices, that I should have almost thought incredible had I not read it myself; for instance, carbonate of soda 4*d.* per lb., citrate of magnesia 1*s.* 6*d.* per lb., seidlitz powders 9*d.* per doz., and boasts in his advertisement of selling articles in the trade cheaper than any other man. I hear, too, that he dispenses prescriptions and charges only as much as the articles come to, and sells 13½*d.* patent medicines at 10½*d.* each. I think, with the difficult examinations that have to be passed, there might be more uniformity in prices, without such foolhardy competition. T. H.

J. N. M.—The examination is a written one, and may be conducted by a local secretary, if notice be given to the Registrar.

A. Z.—The method proposed by Dr. Attfield in the article referred to, for obtaining a solution of quinine in cod-liver oil, was to produce an oleate of quinine by digesting the alkaloid, well dried, with twice its weight of oleic acid at the temperature of boiling water for an hour or two. Oleate of quinine has the consistence of a soft resin, is perfectly stable, and may be regarded as a concentrated solution of quinine, to be diluted whenever necessary, and to any required extent. The paper is too long to be extracted entire, but copies of the number containing it may be had on application to the publishers.

C. G. Bunn.—(1.) Yes. (2.) The Latin examination includes the translation into English of a paragraph from the first book of Cæsar, *or* a passage from each of the following works:—Pereira, 'Selecta e Præscriptis,' and the last edition (Latin) of the *London* Pharmacopœia.

Arum.—(1.) The different directions as to the pronunciation of the words mentioned result from the different rules of orthoepy followed by the lexicographers. We cannot undertake to decide which is right. (2.) We should recommend you to follow Professor Bentley's arrangement.

Guaco.—We do not know the substance inquired about, but believe the name to be that given to one of the alleged remedies which are supplied by benevolent advertisers in return for a certain number of stamps.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. F. Liley, Mr. M. C. Cooke, Mr. J. R. Jackson, Mr. D. Hanbury, X. Y. Z., J. A. M., F. P. C., A. P. S., "Cyathus," "Unguentum," "Bo-Peep."

"*Chemicus*" has not complied with the rule respecting anonymous communications.

BEEF EXTRACT IN COMBINATION.

BY PROFESSOR EDWARD PARRISH.

The greatly increased reliance by practitioners of medicine on the use of proper nutriment, not only as an aid to convalescence, but also to sustain the forces of life in the incipient stages, and, indeed, throughout the course of some very prevalent diseases, has called for a variety of beef extracts for the ready preparation of essence of beef and beef-tea. The large sale of these attests the value placed on them, not only by physicians but by the public at large, and yet the idea of making articles of diet from something bought at the drug store, and having some of the characters of a medicine, is so repulsive to the keen sensibilities of many invalids, that often resort is had to the tedious extemporaneous methods of extracting the juice directly from fresh beef.

Moreover, it is often observed that, however nicely made, essence of beef and beef-tea soon lose their relish when given constantly, under medical advice, or as a part of the treatment—a distaste which is sometimes due to the disease, but perhaps oftener to the fact, that variety constitutes one of the chief attractions in matters dietetic.

In giving medicines, the importance of consulting the taste of the patient is less recognized; they are taken as a disagreeable necessity, and are not expected to possess the attractions which usually pertain to articles of diet.

These considerations seem to favour the idea of combining beef extract into pharmaceutical preparations, and thus giving it at stated intervals, *nolens volens*.

The composition of such preparations being unknown to the patient, and the taste being disguised by admixture with suitable adjuvants, that feeling of disgust created by the idea of animal food in an undefined state, intermediate between medicine and diet, is avoided.

Of the several proprietary beef compounds recently introduced I have little knowledge, and have no doubt that they are useful. The object of this paper is not to supersede these, but to point out a method of varying the composition of nutritive medicinal compounds, and to put it within the reach of all to meet the requirements of the medical practitioner, by furnishing any of these extemporaneously, as required.

Beef stock, as sold in tin cans, soldered, has been cheap since the war, and by solution in glycerine, diluted with water, may be brought to a tolerably permanent fluid, miscible with pharmaceutical preparations. The proportion may be six parts of beef stock to three or four of water, and one of glycerine. In time this becomes gelatinous, probably by the glycerine combining with gelatine, always present in the stock.

Experiments tried by exposing this fluid to a temperature and other circumstances favourable to putrefaction, indicate that in midsummer it would be necessary to keep it in a cool place, yet probably no further difficulty would be experienced with this than with many other preparations which during the intense heat of our summers require special precautions to prevent decomposition.

In the absence of beef stock, resort may be had to either of the solid extracts of beef. I have dissolved Tourtellot's extract in eight parts of water, and added half a part of glycerine, but the solution, like the foregoing, is very inelegant. A good addition to either of these is caramel, which improves the colour and gives a flavour of bitterness.

Gelatine is the ingredient which interferes with the eligible appearance and physical properties of these solutions, and hence to remove this without materially impairing their nutritive qualities is a desideratum. Solutions of tannin added in small portions, after largely diluting with water, causes a white flocculent to separate, which may be removed on a filter or Canton flannel strainer, and then, on evaporation to about the consistence of syrup, we have what may be termed a clarified solution of beef extract, preserved by glycerine. The tannin should be added with care, not to have an excess, and the filtration should be resorted to before the solution is inspissated, and yet after heat has been applied.*

The beef basis being at hand, it is easy to make suitable extemporaneous mixtures with iron, quinine, the phosphates, and other tonics, dissolved either in very dilute alcoholic, or in saccharine menstrua. Some judgment is required in the selection of these. As a rule, sweet syrups are best adapted to children; molasses is used in one of the popular proprietary nutritive tonics; but, on the other hand, great care is required not to cloy the stomach of an adult with sweets constantly administered.

Fluid extract of liquorice is one of the best excipients for disguising the meat flavour; that made from the root by the use of diluted alcohol gives a strong liquorice flavour and taste without much body. Diluted phosphoric acid, or the compound syrup of phosphates, is a good addition. Strong alcoholic liquids would be incompatible with it, but wines mix well, increasing fluidity and producing but slight precipitation. Wine of iron or bitter wine of iron may be advantageously added in the proportion of one part of the wine to three of the extractum carnis fluidum.—*American Journal of Pharmacy.*

BRISTOL PHARMACOLOGY.

BY W. W. STODDART, F.C.S., F.G.S.

(*Continued from page* 922.)

Nat. Ord. URTICACEÆ.

This, though not a very extensive Order, yet is one containing plants of great utility, some supplying edible fruits, some valuable textile fibres and others caoutchouc. From others, also, is procured the terrible upas poison, the intoxicating churrus, the fig and the mulberry.

Humulus Lupulus (Linn.).

This well-known climber is often seen on the hedges near Stapleton, Flax Bourton, Crew's Hole, Saltford and Bishopsworth. Near the last locality it has been seen growing with the *Cuscuta Europæa.*

The Hop plant was introduced into England from Flanders in the reign of Henry VIII.:—

> "Hops, reformation, bays and beer,
> Came into England all in one year."

Some naturalists have hesitated to consider the Hop

* Liebig's beef extract is free from the objection arising from the presence of gelatine, and, as it is desirable to dispense with the tannin treatment, and to be able to prepare an eligible fluid by an easy and quick process, resort may be had to this elegant though costly product.

as other than naturalized, but Babington says it is truly a native. It is the female plant that is so much employed as a brewing ingredient, the strobiles being the part used. These are composed of scales, each of which has at its base two minute seeds. On the scales and seeds are found yellow, granular, resinous glands, which, as the strobile ripens, become loose and drop off. These minute bodies are used in pharmacy under the name of lupulin, and in them resides the flavour so highly prized. The strobiles yield from 8 to 18 per cent. of these lupulinic grains. They are most interesting microscopic objects; from $\frac{1}{200}$ to $\frac{1}{140}$ of an inch in diameter, and are shaped like flattened, subovate little saucers, and covered over with cell markings. They are attached by a short pedicel. As they get older, the central portion expands, and instead of the former concave shape, swell out and become convex.

According to the analyses of MM. Pelletier and Payen, the so-called lupulin consists of volatile oil, 2 per cent.; bitter extract, 10 per cent.; resin, 50 per cent.; and tannic acid, 5 per cent.,—the remainder being gum, calcium and potassium malates, etc. When distilled with water, about 1 per cent. of valerianic acid ($C_5H_{10}O_2$) passes over, with an oil consisting of a hydrocarbon ($C_{10}H_{16}$) and valerol ($C_6H_{10}O$). The latter, by keeping, becomes converted into valerianic acid. Hence the peculiar cheesy flavour of old hops.

$$\underset{\text{Valerol.}}{C_6H_{10}O} + H_2O = \underset{\text{Valerianic acid.}}{C_5H_{10}O_2} + 2\,H.$$

One hundredweight of hops will yield about forty pounds of extract as ordered by the Pharmacopœia.

Nat. Ord. Ulmaceæ.

The plants forming this Order differ from the last by never having the flowers in the form of catkins, but in clusters of flat, membranous, leaf-like expansions, with a notch at the top, and one seed fixed in the centre.

Ulmus campestris (Linn.).

This noble tree occurs very generally throughout the neighbourhood. Fine examples may be examined in the grove leading to Redland Court, and in some of the city squares. The finest specimens are found where the soil is rich, friable and sandy.

Elm bark is a tonic and astringent, and is much prized in Norway for tanning leather used for glove-making. Ulmin, so familiar to the agricultural student as one of the constituents of mould, peat, etc., derives its name from the substance found in the black excrescences so often observed on the trunks of old elms.

Elm bark contains about 20 per cent. of a kind of mucilaginous substance, 3 of tannin, 6 of resin and 10 of inorganic salts.

Nat. Ord. Amentaceæ.

This valuable Order of trees is distinguished by the flowers being arranged in catkins (amenta). Only one is mentioned in the Pharmacopœia.

Quercus pedunculata (Willd.).

Perhaps no natural object has been so frequently mentioned by writers of every age and clime as the Oak. It is frequently mentioned in the Bible, although probably in many passages the evergreen oak (*Q. Ilex*) is the species meant. It was held sacred by the Greeks, Romans, Gauls and Britons. Horace speaks of

> "Quercus et ilex
> Multa fruge pecus, multâ dominum juvet umbrâ."

and in many of his beautiful descriptions of rural scenes alludes to the groves of oak-trees:—

> "Querceta Gargani laborant."

In his 'Bucolics,' 'Georgics' and 'Æneid,' Virgil over and over again mentions the monarch of the forest as one of the principal objects of a sylvan landscape:—

> "The monarch oak, the patriarch of the trees,
> Shoots rising up, and spreads by slow degrees;
> Three centuries he grows, and three he stays
> Supreme in state, and in three more decays."

The chief value of the plant resides in the bark, which is celebrated for the large quantity of tannic acid it contains. The barks are gathered in the spring, because they contain a larger percentage and are more easily separated from the wood. The bark of young stems is most highly prized. Besides tannic acid, oak-bark contains gallic and quercitannic acids, and about 2 per cent. of ash.

The following example of the percentage of tannic acid from oak-barks, at different periods of the year, are taken from the author's laboratory journal:—

Entire bark in	May	= 6·05	per cent.
,,	August	= 4·39	,,
Inner bark only	May	= 21·13	,,
,,	August	= 15·34	,,

Tannic acid ($C_{27}H_{22}O_{17}$) from oak is that kind which gives a bluish-black colour with ferric salts. It is glucoside, for when boiled with diluted acid it becomes converted into glucose and gallic acid ($C_7H_6O_5$).

$$\underset{\text{Tannic acid.}}{C_{27}H_{22}O_{17}} + 4\,H_2O = \underset{\text{Glucose.}}{C_6H_{12}O_6} + \underset{\text{Gallic acid.}}{3\,C_7H_6O_5}.$$

Gallic acid differs from tannic by producing no precipitate with gelatine. It is, however, a singular circumstance that, when mixed with gum it has that property.

When tannic acid is heated, it becomes decomposed into pyrogallic acid ($C_6H_6O_3$), so well known as an article of great use in photography, and a singular dark-coloured insoluble substance termed metagallic acid ($C_6H_4O_2$).

$$\underset{\text{Tannin.}}{C_{27}H_{22}O_{17}} = \underset{\text{Pyrogallic acid.}}{3\,C_6H_6O_3} + \underset{\text{Metagallic acid.}}{C_6H_4O_2} + 3\,CO_2.$$

The tannic acid procured from catechu, cinchona, etc. differs from that contained in oak-bark, by giving, with ferric salts, a greenish instead of a bluish-black precipitate, and by not yielding glucose or pyrogallic acid. Quercitannic acid present in oak-bark differs from the usual tannic acid of the galls by being non-convertible into gallic acid or pyrogallic acid, and from the tannic acid of catechu by giving a bluish-black precipitate with ferric salts.

During the last few years the oaks in the West of England have been infested by galls. A great number have been analysed by the author, but have proved useless for commercial purposes, from the small percentage of tannic acid present. This may be owing to being allowed to remain on the tree till the insect escapes, for nearly all were perforated.

NOTICE ON THE DECOLORIZATION AND DEODORIZATION OF TINCTURE OF IODINE.

BY JAMES LAKER MACMILLAN.

Within the last year or two an unusual degree of attention has been devoted to methods for decolorizing tincture of iodine. The agent commonly resorted to for this purpose is ammonia; a practice which cannot be too highly censured, inasmuch as a change takes place which is highly detrimental to its medicinal properties. By the addition of ammonia to this tincture, one or more compounds of iodine and nitrogen are formed, which are thrown down in the state of a black precipitate, which is redissolved after standing for a number of hours, or by the addition of carbolic acid.

The reaction is as follows:—

$$6I + 4NH_3 = NI_3 + 3NH_4I.$$

Thus, it will be seen that the use of ammonia for this purpose is detrimental to the medicinal efficacy of the iodine; and that when such so-called tinctures prepared by this process are substituted for the tincture proper, the physician unwittingly uses a solution of the above compound. To rectify this error is the object of this notice; to which I append the following simple, though none the less noteworthy processes, for the consideration of the pharmaceutical body at large.

Process No. 1.—Potassium acetate ($KC_2H_3O_2$) 2·59 gram, with 7·7 gram solution of KHO, having a specific gravity of 1·06, at 15·55° C., are capable of decolorizing 2·592 decagrams of tincture of iodine, B. P.

Process No. 2.—A similar reaction is manifest if treated with a solution of $NaHO$, having a specific gravity of 1·07 at 15·55° C., in the proportions of 5·3 decigrams of the sodium solution to 3·6 gram of the tincture.

[We believe these preparations (introduced by the late Sir James Simpson) should not be decolorized, since that cannot be done without interference with the medicinal efficacy of the iodine.—Ed. Pharm. Journ.]

ORIENTAL SPICES.

BY JAMES PATON,

Assistant-Keeper in the Museum of Science and Art, Edinburgh.

(*Concluded from page* 967.)

With the discovery and introduction into commerce of the clove and nutmeg, the last link in the series of Oriental spices was supplied. In the early and rude state of the traffic, the steps by which spices reached the European markets were numerous, and their progress slow. The Javanese brought the Moluccas spices to the western ports of the Archipelago. The Klings or Telingas next carried them to the eastern shores of India. Thence the third journey was to Calicut, or other port on the Malabar coast, where were collected the pepper and other spices of India and Ceylon. Fourthly, the Arabs conveyed them to their ports on the Red Sea, or the Persian Gulf, and from these, by many stages, they reached the Mediterranean and Black Sea ports. These four voyages were, as already remarked, reduced to one by the Arabs in the seventh century, under the impulse given to their energies by the doctrine of Mahomed, and in this condition the Asiatic portion of the journey continued till the discovery of the Cape passage struck it a fatal blow.

On the European side many important cities arose, flourished and attained great power during what we call the dark Middle Ages, through their hold on this most lucrative commerce. Smyrna caught the caravans that toiled along the Euphrates Valley, and across the Desert, and forwarded the precious products to the Black Sea ports and Constantinople. To a few mud-flats at the head of the Adriatic the miserable remnant of a Roman province were, in the sixth century, hunted by the hordes of the Goths and Huns, and in miserable huts, they caught a few fish, and dried a little salt, in which they began a humble commerce. From that beginning the proud republic of Venice arose, the commercial influence and political power of which overshadowed the civilized world. The records of the Middle Ages are principally made up of the wars and commercial rivalries, the endeavours to outwit and overreach each other in the great eastern trade of the Venetians and their great compeers the Genoese, till the Portuguese involved both in inevitable ruin by opening up the Cape passage.

Towards the beginning of the fifteenth century the civilization and commercial instincts which had been marching steadily westward reached what appeared to be the outer limit of the world. The ocean-bounded kingdoms cast greedy, longing eyes at the glories of Venice derived from the costly aromatics of the East. The restless spirit of enterprise chafed at the seemingly impassable barrier. Then at the courts of these Western nations appeared two brothers, Genoese sailors, of the name of Colon or Columbus, with a proposal to reach the land of spices by what appeared to them a short voyage due west. Ultimately the one, by name Christopher, succeeded with the king of Spain, and found, not the little spice islands, but the great continent of America. At the same time, the Portuguese had sent two emissaries to the East to explore the countries where the pepper, cinnamon and spices that enriched Venice were produced. One went to India, where he saw pepper and ginger actually growing, and learned that cloves and nutmegs were produced in very distant eastern countries. On his return to Cairo, he sent to his government much information regarding eastern commerce, and departed to Abyssinia, the land of Prester John, where his companion had died. Here he was detained twenty years,—the Abyssinians even at that time had a fancy for Europeans;—then he was allowed to return home, without his release costing his country ten millions of pounds.

Meantime, the restless Portuguese had likewise been feeling their way along the African coast, and Bartholomew Diaz had actually doubled the Cape, which, from its stormy waters, he called Cabo Tormentosa; but the king, seeing better omen in it, changed it to Cabo de Boa Esperança. Thereafter, in 1498, Vasco de Gama, with the first European vessel which had ploughed the eastern seas, dropped his anchor in the harbour of Calicut. The stream of merchandise, which for twenty centuries had poured its torrents of wealth through the Red Sea and the Persian Gulf was immediately dried up, and the States which had flourished by it withered like plants from which the nourishing roots were cut off.

The success of the Portuguese discoveries stimulated the enterprise of other maritime nations; and to the endeavours to find a route to the Spice Islands are distinctly traceable our own early efforts to establish a north-west passage which have now such tragic interest for us, and of which we have not even yet heard the last. To the same impulse is also owing the first circumnavigation of the globe by the brave but unfortunate Spaniard Magellan, who, by sailing westward, reached, in 1521, the northern islands of the Archipelago, known and yet possessed by the Spanish as the Philippine Islands.

Such were some of the great ends attained for the world by the agency of this commerce. But with these the benefits to humanity ceased. It is true that for a time wealth, power and prosperity flowed into Portugal. The enhancement in price which naturally accrued on these luxuries, from tedious, difficult and dangerous journeys, and which had averaged at lowest twenty times the original price, the Portuguese unjustly continued to demand, and Europe was no gainer in this respect by the opening up of the ocean path to the East.

Thus we find that pepper, when it came to England by the tedious and costly journeying already described, cost 3*s.* 6*d.* per pound, or about sixteen times its cost in the Malabar market. Under the Portuguese it rose to 4*s.*, or eighteen times its prime cost. Cloves continued to cost about 10*s.* 6*d.* per pound, thirty times their price in the Moluccas, and the Venetian merchants for some time even continued to compete with their western rivals. Nutmegs and mace by way of the Mediterranean, which at one time could be bought in the Moluccas for ½*d.* and 1*d.* per pound respectively, cost 4*s.* 6*d.* and 9*s.* Under the close monopoly of the Dutch, they rose—nutmegs to 10*s.* 3½*d.* per pound, and mace to £1. 10*s.* 5*d.* Thus mace cost in England 730 times what was once regarded as its fair value in its native islands! With such enormous sources of profit, the spirit of avarice and greed was effectually stirred up, and all sense of moderation, uprightness or even decency in dealing was forgotten among the western trading Powers. The claims of the possessors of the soil were never for a minute considered, except in so far as they were tools for production of wealthy cargoes, or obstructions to the rapacity of the traders, which should be treated as men treat noxious weeds in their gardens. The history of the three centuries which follow the discovery of the Cape passage is made up of sickening details, intrigue, meanness and bloodshed; the Portuguese by such means established themselves, by like means the Dutch sought to supplant them, and we are bound to confess, by the same unholy method, our nation also founded our great eastern empire. Honourable trading was never thought of. The Pope first divided nearly the whole world, known and unknown, between the Spaniards and the Portuguese. The Portuguese seized their eastern possessions as quickly as distance and their limited navy would allow. Their first work was to overawe the people by strongly-fortified trading posts; then the triple work of commerce, conversion and extermination went on hand in hand. Next the Dutch appeared, and dexterously used the cowed and terrified people against their original oppressors. Codlin, they said, was the friend. Then the appearance of the British completed the triangular duel; and, with varying fortunes, they fought, separately or any two against any one, till the Portuguese were first in effect driven from the field. The Dutch were ultimately driven from Ceylon towards the end of the last century, but their hold upon the eastern archipelago was never fairly shaken. There, through persevering monopoly and other narrow-spirited restrictions, they ultimately succeeded in killing the goose that laid the golden eggs; and the trade which made the glories of Venice and Genoa, and first established the great trading communities of the West, is now carried on at a loss to the Dutch government. In Ceylon we have the same tale to tell; the settlers there also were too late in being removed, and the cinnamon trade has become insignificant and unheeded.

Yet we must acknowledge that more powerful agencies have been at work than the spirit of monopoly. A trade has sprung up with the East which, in extent and value, is a hundredfold that of the spices. Tea and coffee have supplied a new stimulant in a much more manageable form; they have effected a social revolution, and spice, the former king of commerce,—a name that lured men even more than the charm of gold,—would now little more than occupy the capital of one of our great merchants; and the trees which were guarded with inhuman jealousy, and the roots of which Roman conquerors placed with divine honours in the temples of their gods, may now grow, drop their fruit, and wither unheeded in the tangle of tropical forests.

UVA URSI.

BY JULIUS JUNGMANN.

[The author gives a good botanical description of the plant and its habitat; he describes the drug, refers to its introduction in medicine, and reviews the analyses made since 1809 to the present time, then he proceeds to his own experiments.]

A quantity of coarsely powdered *Uva ursi* leaves was exhausted with cold water by percolation, the infusion heated to the boiling-point, strained, a greenish flocculent coagulum of albumen was left on the strainer; the infusion, after having been more concentrated, was treated with freshly prepared hydrated oxide of lead, until it would no longer produce a precipitate; this was separated by a filter. The filtrate, still more concentrated by evaporation, was divided into two parts; the first was set aside in a warm place to evaporate spontaneously, the second was treated with strong alcohol; this produced a bulky precipitate of gummy matter, which was removed by filtration; the alcoholic filtrate was again divided into two portions, the first set aside to evaporate spontaneously, the second evaporated to a syrup and then treated with ether; the different ethereal solutions were mixed and evaporated at common temperature. The residue consisted of a mass of nearly colourless prismatic crystals of considerable size, of a bitter slightly acrid taste, with a small quantity of resinous matter of peculiarly disagreeable odour adhering—ericolin.

They could be easily purified by either washing them with ether, which would dissolve out the resin, or else by dissolving them in a small quantity of boiling water, filtering and recrystallizing; thus purified from water they were inodorous, not near as large, but small needles having a silky lustre.

The alcoholic solution yielded a dark coloured extract nearly black; this was redissolved in alcohol and treated with animal charcoal, filtered and again evaporated spontaneously; yielded, after being pressed and dried, yellowish-white crystals of a flocculent character having no odour.

The aqueous solution, which had been set aside in a warm place, was found, after about two weeks standing, to consist of a soft extractive mass, covered all over the surface with small white crystals, very difficult to remove, on account of the large amount of black, gummy extractive adhering to it. The crystals contained in this mass could only be obtained after long and repeated treatment with animal charcoal; to remove colouring matter and other impurities, it might be purified by precipitating the colouring matter by a solution of *alum;* but this mode of proceeding can only be recommended when *arbutin* is the only object in view, otherwise it is objectionable, as it complicates the process. A quicker way, however, to obtain the crystals, I found to be by treating the extractive mixture with a mixture of alcohol and ether, in which they readily dissolve, leaving behind nearly all the impurities; as thus obtained, the crystals have, in their moist condition, a yellowish colour, becoming nearly white when dried; they possessed the same properties as those obtained previously.

All the crystals obtained by these different processes proved to be *arbutin*, the discovery of which was first announced by Kawalier in 1852.

A second quantity of leaves was reduced to a coarse powder, decocted with water, the decoction strained and precipitated with neutral acetate of lead, the precipitated lead salt was filtered off and the filtrate was treated with basic acetate of lead, until a precipitate was no longer produced, this being filtered out. Sulphuretted hydrogen gas was passed in the filtrate until all the lead was precipitated; the sulphuret of lead was then removed by a filter, and the excess of hydrosulphuric acid by heating the filtrate; this was evaporated to a soft extract, redissolved in water, treated with animal charcoal, then again filtered and evaporated, and, while hot, set aside. After about twenty-four hours' standing, the bottom of the vessel was covered with bunches of small crystalline needles of arbutin; these were pressed and dried between filtering-paper, and purified by redissolving them in a small quantity of boiling water and again allowing the crystals to separate; these, when pressed and dried, consisted of small prismatic needles having a silvery lustre. This second process for obtaining the arbutin is, in the main points, the original one of Kawalier, except that he does not precipitate with *basic* acetate of lead, which, however, removes nearly all the gum and colouring matter, and thereby facilitates the crystallization to some extent.

Arbutin generally crystallizes from ether in prismatic needles of considerable size and perfectly colourless, from an alcoholic solution in small acicular crystals of a white colour, and in small bunches of needles from water; it is neutral in its behaviour, very soluble in warm or hot water, less in cold water or alcohol, more in hot alcohol, very sparingly in ether; a concentrated solution of arbutin is precipitated by strong alcohol or ether added to it, but the precipitate rapidly disappears on shaking. Concentrated sulphuric acid or hydrochloric acid, added to the crystals on a small plate, gradually dissolves them without change of colour. With nitric acid the crystals first turned black and then slowly dissolved, the acid assuming a yellow colour and giving off fumes of nitrous acid. Arbutin in aqueous solution does not affect an alkaline solution of sulphate of copper, the salts of lead, acetate and subacetate do not precipitate it, salts of iron have no effect upon it; other reagents for organic bodies as tannic and gallic acid, bichloride of mercury, nitrate of silver, iodide of potassium and bichloride of platinum were tried without any results.

While experimenting with these reagents, I accidentally found a very characteristic and remarkable test for arbutin. When a solution of arbutin in water is rendered alkaline by ammonia, or any other caustic or carbonated alkali, and then phosphomolybdic acid is added, a blue colour is produced; in strong solutions the coloration is of a deep azure blue, but the bluish hue can be observed even in very dilute solutions. One grain of arbutin was distinctly indicated in twenty pints of water (1 in 140,000); this reaction does not occur with molybdate of ammonia, nor does it take place when phosphoric or phosphomolybdic acid is acted upon by an alkali alone.

A solution of arbutin may be perfectly colourless but still impure; when to an impure solution of arbutin ammonia or any caustic or carbonated alkali is added, a deeper, sometimes orange, colour is produced, while a solution of pure arbutin is not affected in this way.

[The author next describes the composition and glucoside nature of arbutin and the mode of obtaining hydrokinone, the literature on the subject being reviewed and compared with his experiments.]

E. C. Hughes, in an essay on *Uva ursi*, published in the *American Journal of Pharmacy*, 1847, describes a crystalline principle which he obtained from the leaves and to which he gave the name "Ursin." This ursin, although it has not been noticed in European literature, has received some attention, and has generally been regarded as a distinct principle in American works. As this was obtained before the known existence of arbutin, and as its mode of preparation is similar to that of arbutin, I was led to suppose that the two might, perhaps, be identical; to satisfy myself, I prepared some ursin according to Hughes' method, which consists in maceration and percolation of the leaves with cold water, precipitating the tannin by a solution of gelatine, filtering and evaporating to dryness, treating the remaining extract by strong alcohol, the alcoholic solution with animal charcoal, filtering and evaporating spontaneously. By this process an acicular crystalline mass, to which a small quantity of resin adhered, was obtained, having nearly all the properties of arbutin; the solution, rendered alkaline, produced a blue colour with phosphomolybdic acid, and it yielded, when boiled with dilute sulphuric acid, the same product of decomposition, hydrokinone, besides separating ericolin.

Hughes states, however, that his ursin was precipitated by carbonate of potash and by the solution of subacetate of lead, while it was not affected by the *tincture* of chloride of iron; but as he uses a solution of gelatine to precipitate the infusion of the leaves, he only gets rid of the tannic acid while the gallic acid remains in solution, and is afterwards obtained together with the arbutin (his ursin). A solution of this mixture, then, of course, precipitates with basic acetate of lead, but then it ought to be affected by the salts of iron; but the tincture which he used is a very uncertain test, owing to the free acid it contains, which does not indicate small quantities, as in this case, while the solution of subacetate of lead precipitates even the smallest trace of gallic acid. Carbonate of potash would produce a slight change in the colour, but an actual precipitation did not take place. The ursin of Hughes must, therefore, be considered as an impure arbutin.

[The author then minutely describes the action of nitric acid on arbutin and the production of binitro-arbutin, discovered by Strecker; also, the decomposition of this compound into sugar and binitro-hydrokinone, after which the effect of chlorine upon arbutin is considered.]

Arbutin has also been found abundantly in *Chimaphila umbellata*, and it probably exists in a number of ericaceous plants. Its medical properties have never been practically applied; it was at one time believed to represent the diuretic properties of *Uva ursi*, and Hughes states that one grain of his ursin proved a powerful diuretic. The celebrated pharmacologist, Dr. Schroff of Vienna, who experimented with pure arbutin, states, however, that it possesses no diuretic properties at all: he gave it in doses as high as 8 grains, and could not detect it in the urine.

When the mother-liquor from arbutin is heated with a dilute acid (sulphuric or muriatic) a resinous body separates, which has received the name of ericolin; this, again, is a glucoside, which, when treated with a dilute acid, splits into grape sugar, and an odorous substance having the character of a volatile oil, ericinol; both have been noticed already by Kawalier in his investigation. In preparing ericolin from the mother-liquor of arbutin, I found that a portion of ericolin is decomposed as soon as it forms into ericinol, giving rise to the strong disagreeable odour of the latter. Ericolin is a dark brown resin, becoming somewhat lighter when dried and rubbed to powder; its chemical composition is $C_{68}H_{56}O_{42}$. Its decomposition into ericinol is shown by the following:—

Ericolin.		Ericinol.		Grape Sugar.
$C_{68}H_{56}O_{42} + 8HO$	=	$C_{20}H_{16}O_2$	+	$4C_{12}H_{12}O_{12}$.

[The literature on ericinol and ericolin is now reviewed, and their occurrence in different plants spoken of. The precipitate obtained with hydrated oxide of lead was found to contain tannin, gallic and malic acids, but to be free from tartaric and citric acids. The precipitate obtained by adding alcohol in a concentrated infusion of the leaves, contained gum, glucose and a lime salt. The leaves, previously exhausted with water, were treated with ether, and Trommsdorff's urson was prepared from the ethereal tincture (see Am. Journ. Ph., 1854).]

Trommsdorff's process directs the ethereal extract to be washed by ether before treating with alcohol; this removes, besides the colouring matter, some fatty matter; but when operating upon larger quantities, I believe that animal charcoal will answer the same purpose. Another way to prepare urson is to percolate the leaves, previously exhausted by water, with strong alcohol; the dark-green tincture deposits already on standing a large quantity of nearly white urson, which only needs recrystallizing; the remainder of the tincture is evaporated, treated with water, and then washed with ether and recrystallized from alcohol. Urson, when pure, possesses neither odour nor taste; it is insoluble in water, sparingly soluble in alcohol and ether. It is not affected by alkalies or dilute acids.

Concentrated sulphuric acid turns it black and gradually carbonizes it, the acid assuming a red colour. Concentrated nitric acid turns it yellow, gradually dissolving it, giving off nitrous acid. When heated, urson melts into an amorphous transparent mass; at a still higher temperature it boils and sublimes in a test-tube unchanged. Its medical properties have as yet not been ascertained, at least no physiological experiments have been made with it, and very probably it is entirely inert. A small quantity of *volatile oil* was found in the aqueous solution of the ethereal extract, besides some tannic and gallic acids.

The organic constituents of uva ursi as obtained by this investigation, therefore, are:—

Arbutin, and its product of decomposition, hydrokinone; ericolin, ericinol, urson; (ursin, the diuretic principle of Hughes, was found to be impure arbutin;) tannic, gallic and malic acids, then a small quantity of volatile oil, fatty matter, wax, gum, sugar, albumen, colouring matter, etc.

The test for arbutin may, perhaps, serve for finding this principle in plants, without isolating it, for an infusion of uva ursi, when diluted with sufficient water to make it perfectly colourless and then rendered alkaline, produces, on the addition of phosphomolybdic acid, the blue reaction due to arbutin; when the alkali (ammonia) is added to the diluted colourless infusion, a colour (orange) again appears, owing to the astringent acids present; this colour must also be removed by again diluting it with water, before the final addition of the phosphomolybdic acid.

This test cannot be applied to a strong infusion, because phosphomolybdic acid reacts with tannic and gallic acids green, and the blue colour cannot then be observed. —*Amer. Journ. of Pharmacy.*

ERYTHROCENTAURIN IN AMERICAN CENTAURY.

BY JOHN F. HUNEKER.

This principle was discovered in European centaury (*Erythræa Centaurium*), a few years ago, by Méhu, a French chemist, who obtained it in the minute quantity of one grain in three thousand grains of the herb. The question very naturally arose, whether American centaury (*Sabbatia angularis*) also contained this principle; the experimenter will prove that it may be obtained.

The flowers and leaves of *Sabbatia angularis* to the amount of two pounds were exhausted with one gallon of water, a portion of which was evaporated by a water bath, and allowed to stand to deposit the apotheme. This was separated by filtration, and strong alcohol added to the filtrate, which precipitated gum. On again filtering, the infusion was evaporated to the consistence of a syrup, and, on cooling, washed with strong ether, which took up erythrocentaurin and deposited it on spontaneous evaporation. Erythrocentaurin, as thus obtained, is a non-nitrogenous principle, in small acicular crystals, which are transparent, but in this case were contaminated with yellow colouring matter, and, being in such a small quantity, the experimenter feared losing them in decolorizing.

The crystals have a sharp acrid taste, reminding one of tobacco, and are soluble in alcohol, ether, water, alkalies in solution and acids, but insoluble in fixed and volatile oils, being also slightly volatilized by heat.

The only proofs that they are similar to erythrocentaurin of the European centaury are:—first, that they exist in the same minute quantity; second, that they are *reddened* by solar light, but if dissolved and recrystallized, regain their original colour. Therefore there is not a doubt but that these principles are similar in composition and character.

[The author made a series of experiments to determine the proximate composition of American centaury, and found, besides erythrocentaurin, resin, chlorophyll, fatty matter, gum, albumen, pectin, bitter extractive, trace of volatile oil, an organic acid, red colouring matter and salts. He was unsuccessful in his attempts to isolate and crystallize the bitter principle.

The author regards the aqueous extract as the most concentrated pharmaceutical preparation; he gave ten grains of it to a half-grown cat, which in a short time appeared to be under the influence of a narcotic sedative; after sleep, lasting for two hours, violent purgation set in, causing death in twenty-four hours.—Ed. *Amer. Journ. Pharm.*]

THE CHEMISTRY OF CALICO PRINTING.*

BY JAMES BLAIR.

The art of producing coloured figures or patterns on cotton cloth has been known and practised for many years in this country, and for centuries in India and China. Within the last quarter of a century this industry has made great progress, due to the use of improved appliances, and the more accurate knowledge of colouring matters and their various compounds, besides the discovery of many new colouring matters, the result of unwearied chemical investigation and research. This result has been greatly attained by calico printers themselves, among whom are to be found many able chemists.

The old plan of printing with blocks by hand has been almost entirely superseded by the cylinder printing machine, and in every department more perfect machinery has been introduced, with a corresponding decrease of manual labour. The result of this is, that

* Paper read before the Liverpool Chemists' Association, on March 16th and April 13th, 1871.

while the production of printed goods is yearly increasing, the number of operatives employed is nearly stationary; the number of print-works is also smaller than previously, the small works having been gradually supplanted by a few large ones. Some of these are very extensive, employing over 1000 operatives, and producing nearly 1,500,000 pieces of printed cloth per annum.

Of the very many colouring matters known, comparatively few are now employed by the calico printer in producing all the combinations of colours he requires; and these vary greatly, both in the manner of application and in the value of the effects produced; and as chemistry has furnished us with a host of new colouring matters,—aniline, phenol, naphthaline, and anthracine colours,—and as these are commercially valuable just in so far as they can be employed by the dyer and printer, I have thought that a brief sketch of the various operations, and the chemical changes involved, might possess some little interest.

Fibres may be generally divided into two classes, animal fibre and vegetable fibre,—the former represented by silk and wool, the latter by flax and cotton, which entirely differ, both in their formation and in the manner in which they retain colouring matters. Animal fibre, such as wool, presents under the microscope the appearance of a solid cylinder of a soft spongy matter, has considerable elasticity, and absorbs and retains readily most colouring matters. It contains a fatty matter, from which it has to be freed by scouring with very weak alkali, to prepare it for dyeing. Wool, also, is strongly acted on, indeed dissolved by alkalies, and it is turned yellow by immersion in nitric or sulphuric acids. Cotton, on the other hand, is unchanged in colour by NO_5 or SO_3, but first swells up, and by lengthened immersion dissolves in these acids, while it is nearly unaffected by treatment with alkaline solutions, and it contains no oil in the fibre. Wool not only absorbs colouring matters from their solutions, but many metallic salts (as $Al_2O_3SO_3$), which cannot be removed by washing with cold water, and only by large volumes of boiling water. Cotton, on the other hand, has a very weak affinity for metallic salts and colour. When viewed under the microscope, a cotton fibre presents the appearance of a hollow cylindrical tube, sometimes slightly oval, the walls of the tube being coated with a fine down. Some chemists, as Persoz, have maintained that the union of fibres with metallic salts and colouring matters was purely chemical, and that the difference between wool and cotton in this respect was simply one of degree. However, Mr. Crum has shown that dyed cotton cloth retains the colour simply mechanically; in other words, the dyeing of cotton consists in introducing the colouring matter in a soluble form into the hollow tube, and then solidifying it by forming an insoluble lake with some metallic salt or other mordant, when the insoluble compound so produced is unable to escape by the narrow openings of the fibre.

In unripe or not fully-developed cotton the tube is nearly flat, and too narrow to admit of solution; consequently, this cotton will not dye. The printer receives the grey cloth direct from the loom, and turns it out ready to be made up into dresses, which involves several operations preparatory to, and succeeding, the impression of the coloured pattern on the cloth. Preparatory to the printing, the cloth is singed and bleached.

Singeing is a purely mechanical operation, and has for its object the removal of the soft down coating the exterior of the fibres. The appliance consists of a small furnace about 10 ft. long by 6 ft. high and 5 ft. broad; in the middle of the roof of the furnace, and running its entire length, is a semicircular bar of copper, which is kept red-hot by the fire underneath. The cloth is drawn over, and, by pressing in its passage the red-hot copper bar, the down on the cloth is burnt off; but the spark on the cloth is extinguished before the cloth can be materially injured by passing immediately through a trough of cold water. This operation, if properly conducted, does not injure the strength of the fibre, which should sustain the same strain after as before singeing. The next operation is bleaching.

Bleaching has for its object purification of the fabric from all coloured or other impurities, whether naturally associated with the tissues or added to serve some purpose, and which, communicating more or less colour to the cloth, thereby destroy its beauty. These are a resinous matter, a yellowish colour, soluble in alkalies; the dressing employed in the manufacture of the cloth, and the coloration produced by singeing. This process is conducted in the following manner:—

The grey cloth is first damped (by passing through a cistern filled with cold water, and is then drawn through squeezers, by which the damping is made uniform and the excess of water removed) to make it less bulky in the kier, to which it is transferred from the squeezers by a winch.

During the filling of the kier the valves at the bottom are kept open to allow of the escape of any moisture which may fall to the bottom.

In a pot or small boiler, 60 lb. of burnt lime shell are slaked and boiled with 100 lb. of soda ash dissolved in water, until the carbonate of soda is converted into caustic soda.

The solution is allowed to clarify by resting till the sediment ($CaOCO_2$) has fallen to the bottom, and the clear solution is drawn off by a valve situated a few inches above the bottom of the pot, and run into the kier where the grey cloth has been arranged. The charge is made up with water to 900 gallons, or till the cloth is covered with the alkaline solution. This is the charge for 4000 lb. of grey muslins or calicoes, and is boiled for four hours under 35 lb. pressure steam.

The solution is then drawn off from the kier into a cistern, where it is kept for further use, and the goods are cooled by running cold water on them, which is allowed to drain off by the bottom of the kier.

The cloth is then run from the kier through a machine, fed with 200 lb. burnt lime shell slaked and made into a cream with water, and back to the kier, where it is boiled (with the liquor of the first boil and the 200 lb. of lime which it took up in passing through the machine) for ten hours with open kiers.

The exhausted liquor is of no further use and is thrown away; the goods are then cooled, passed through a washing machine with cold water, and then through a souring machine, fed with sulphuric acid, at 4° Tw., and allowed to lie in the sour taken up, on a drainer for four hours.

The cloth is then washed by passing through a machine with water, twice if the water be not very pure, but if quite pure, the washing may be effected by pouring water upon the goods till the sour is washed out.

The goods are then run back to the kier and boiled with a charge consisting of 250 lb. of soda ash, 60 lb. of rosin and 900 gallons of water (which has been previously prepared in the following manner), for ten hours, under 35 lb. pressure of steam. The 250 lb. soda ash are dissolved in 150 gallons of water and added to the 60 lb. rosin. This solution of rosin soap is then run into the kier and water added up to 900 gallons, with the 4000 lb. of cloth, and boiled, as before stated, for ten hours under 35 lb. pressure of steam.

The liquor is then run off and the goods cooled as before. The goods are then washed in a machine and passed through squeezers. The cloth is then passed through a machine, fed with bleaching liquor, at 1° to 2° on the chlorine test, and allowed to lie on a drainer four hours. It is then sweetened by passing through a machine with water, soured as before, and the sour washed out by twice washing with cold water.

It is then dried on steam-heated cylinders.

Previous to printing, the cloth is shaved, or freed from loose fibres, by passing over a spiral knife, dusted, and then beamed on a roller free from all creases. It is then ready for printing.

The colours of printed goods may be divided into three classes, viz. 1. Pigment Colours; 2. Steam Colours; 3. Mordanted Colours.

Pigment Colours are those which require no treatment subsequent to printing to develope them, and which remain in great measure unchanged in colour by printing, and where the operation consists simply in fixing them in or on the cloth. They are of two kinds—1st, soluble pigments, which can be introduced into the interior of the fibres, such as the aniline colours; 2nd, insoluble pigments, which can only be fastened on the exterior, as ultramarine, chrome green, ochres, lakes, etc.

Steam Colours are those in which chemical and colouring matters are so mixed that, when printed, they enter the fibre in solution; but, on being submitted to the action of steam, chemical combination takes place, so as to produce an insoluble colour in the fibre.

Mordanted Colours are those where a metallic salt or other fixing agent is printed on the cloth, which, when subsequently immersed in a bath containing the colouring matter in solution, becomes dyed, the mordant forming with the colour an insoluble lake or coloured compound, as garancine and madder work.

In describing the operation of printing, it is necessary to describe the apparatus employed; secondly, the preparation of the colours, and the mode of procedure.

The printing machine consists of a massive iron roller, accurately turned, supported at each end by a strong iron support or cheek furnished with arms, through each of which works a screw; at the ends of the screws are the rests in which the ends of the copper rollers are placed, and by these screws the rollers can be tightly screwed up against the iron cylinder. There is also an arrangement of screws to fix the rollers more or less aside, so as to enable the printer to fit the pattern that is to make the engravings on the various rollers exactly coincide. Above the central roller of the machine is a light iron roller, and around these two rollers passes an endless blanket of india-rubber. The cloth to be printed is fastened behind the machine on two light projecting arms. The rollers having been properly fastened in the machine, a colour trough of wood or copper is fastened beneath each copper roller; in each trough is a light wooden roller, sometimes a brush, brought nearly in contact with the copper roller; this is to transfer the supply of colour from the trough to the copper roller. Into each trough is then placed the colour to be printed on the cloth by that part of the pattern engraved on the corresponding copper roller. When the machine is set in motion, the cloth is passed between the copper rollers and the iron cylinder of the machine, and in its passage it gets the coloured pattern impressed upon it. Each copper roller is furnished with two knives, one resting along the top, the other along its base; the one is to remove all colour from the surface of the roller, except that in the engraving, before coming in contact with the cloth, the other to take up any loose fibres or down before the roller gets a second supply of colour. Simultaneously with the passage of the white cloth through the machine, two plies of grey cloth are passed through the machine with it, and between the endless blanket of the machine and the white cloth; this is to serve as a blotter and to absorb any excess of colour printed on, and so prevent any spreading of the colours beyond the limits of the pattern.

(*To be continued.*)

FERRATED ELIXIR OF CINCHONA.

BY PROFESSOR MAISCH.

At my request, Mr. William M'Intyre, of Philadelphia, has furnished me with the following formula for elixir of calisaya with pyrophosphate of iron, in which calisaya bark is employed:—

Take of Calisaya ℥iv
Sweet Orange Peel, recently dried ℥iii
Coriander ʒvi
Ceylon Cinnamon ʒiv
Cardamom
Anise, ana ʒij.

Prepare these for percolation, and displace with a mixture of one quart stronger alcohol and three quarts of water.

To this tincture add—
Oil of Orange (fresh) 40 ♏
Lemon (fresh) 16 ♏
Almonds (fresh, essential) 4 ♏, dissolved in Alcohol, four fl. drs.

Agitate this mixture with moist freshly precipitated hydrated sesquioxide of iron (well washed), prepared from an aqueous solution of the sesquichloride, for three or four days, or until a portion filtered off shows no reaction with the tincture of chloride of iron. Filter, and dissolve in it, without heat, two and a half pounds (av.) sugar. Add 1024 grs. pyrophosphate of iron, previously dissolved in a small portion of water, and make up the measure of one gallon, if necessary, by the addition of water. If a more reddish colour is wanted, use a few grains of soluble citrate of iron.

The elixir thus prepared will keep well in colour, and has a resemblance to the article extensively advertised under the same name.

If the cinchona bark contains 3 per cent. of alkaloids, and supposing the bark to be entirely exhausted, one gallon of elixir prepared according to the above formula would contain about 60 grains of alkaloids, or nearly half a grain to the fluid ounce. Cinchona bark, however, cannot be completely exhausted by weak alcohol, and after the treatment of the resulting tincture with hydrated sesquioxide of iron, the natural combination of the cinchona alkaloids is broken up, and nothing of medicinal value is retained by the liquid except the alkaloids. The aromatics used in most of the formulas, I believe, add comparatively little to the medicinal virtues of this preparation, which aims, ostensibly, to unite the tonic properties of cinchona and iron. These considerations induced me to take advantage of the excellent combination of aromatics with calisaya bark, which was suggested by Dr. Squibb, and has met with great favour by the medical corps of the United States army. Accordingly, I have dispensed, for the last five years, a ferrated elixir of calisaya made by the following formula, and manipulated as follows:—

1. Triturate magnes. carbon. ℥ss first with the following volatile oils:—Ol. aurantii ♏ xx, ol. anisi ♏ xv, ol. coriandri and cinnam. ana ♏ 10, ol. carvi ♏ v; then, with a mixture of 2 oz. alcohol and 14 oz. water, throw upon a filter and wash with water until the filtrate measures $3\frac{1}{2}$ pints.

2. Mix tinct. cardam. (simpl.) f℥ij, tinct. zingib. and calami ana f℥i, alcohol Oj, and add syrup. simpl. Oj.

3. Dissolve unbleached quinia ʒiss, with acid. citr. ʒijss, in alcoh. dilut. f℥iv.

4. Dissolve ferri pyrophosph. ʒxx, in aq. ferv. f℥viij.

Add solution No. 3 to No. 2; then add No. 4, then No 1, and finally add $1\frac{1}{2}$ pint simple syrup and $\frac{1}{2}$ pint alcohol. The whole measures $8\frac{1}{2}$ pints, and may be coloured by caramel to suit; each fluid ounce contains about $9\frac{1}{2}$ grs. pyrophosphate, $\frac{3}{8}$ gr. alkaloids, and 1 gr. each of ginger, calamus, and cardamom. It has a very pleasant, warm, aromatic, but, at the same time, a decidedly bitter taste. The unbleached quinia may be prepared from the infusion of calisaya bark, made with acidulated water, by precipitating with an alkali. I have come into possession of a chinoidin containing a large percentage of quinia and quinidia, which has been used with advantage.

The two formulas published above represent the two views held by our pharmacists, namely, that cinchona bark, as such, and the isolated alkaloids alone should be combined with salts of iron.—*Amer. Journal of Pharmacy.*

The Pharmaceutical Journal.

SATURDAY, JUNE 10, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed* "*Pharm. Journ.*"

THE REGULATION OF PHARMACY FROM A MEDICAL POINT OF VIEW.

OUR esteemed contemporary, the *British Medical Journal*, has undertaken to censure with vehemence the action lately taken in reference to poison regulations. Though an entire column is occupied with hard words of condemnation, the real facts of the case are evidently so little understood by the writer that we are filled with wonder to find a journal so likely to be well informed on this subject should have perpetrated such an absurdity as to charge the Council with breaking faith with the Government. It is equally absurd to blame the Council of this Society with having avoided a responsibility that never rested with it, and never was imposed upon it by the Government or the Pharmacy Act, or anything save our contemporary's imagination; for though the public at large, or the general press, might well be excused for ignorance of the fact, we little expected to find a medical journal even forgetting that the power of prescribing poison regulations does not rest with the Council at all, but that it is the Society alone, in its corporate capacity, which has that power under the Pharmacy Act; yet this cardinal fact is overlooked by the *British Medical Journal;* and since its censure of the Council has no other foundation, we have no need to defend that body against the charge of having committed "a flagrant abandonment of public duty."

But, apart from this strange error, we will not affect to be unconscious that our contemporary's strictures were intended to have a wider application. No doubt the writer of the article shares the opinion of those who advocate the adoption of poison regulations in a compulsory form,—they are a numerous and a goodly party, comprising some of the foremost men of British Pharmacy,—but we must not forget that they constitute a minority of the Society which has the power of acting in the matter. Even Mr. SANDFORD, the most strenuous advocate of compulsory regulation, recognizes the propriety of united action in which the minority should succumb to the majority, and we have always contended that this question must be decided by vote. It has been so decided, and whether the decision be right or wrong, whether it be a conclusive settlement of the question or not, those who hold the opinion of the minority have no right to assume that the majority has been unmindful of those duties and obligations which are imposed upon the Society by the Pharmacy Act, or that the opposition to compulsory regulations has been instigated by selfish disregard of what is necessary for the public safety. Without taking side with either of the opinions held on the question of poison regulations, we do not hesitate to say that such an assumption would be monstrous. However obligatory the provisions of the Act may be in regard to poison regulations, it surely cannot be contended that the Society is under the obligation to prescribe regulations unless they were necessary, and it has been decided by the Society that compulsory regulations are not needed.

The Society has done what it deemed necessary, after consideration of the question by those most competent to judge. It has, in fact, adopted the recommendation of its Council (though the *British Medical Journal* does not appear to be aware of this); and until the measures decided upon have proved inadequate to secure the public against danger arising from the keeping and dispensing of poisons, there does not seem to be any rational ground for urging that further steps be taken. Whenever that proof can be furnished, we have little doubt that the members of this Society will duly fulfil their obligations and exercise their privilege of providing a remedy at once protective of the public and conducive to their own interests as a class. Meanwhile, we would suggest to our contemporary that his zeal in the matter of poison regulations may be fitly exercised in reforming the practices of medical dispensers, and with great prospect of benefit to the public. The opportunity for this has been pointed out repeatedly in this Journal, and it is again referred to in this number by a correspondent.

THE PRELIMINARY EXAMINATION.

To undergo an examination, it will be admitted, is not generally one of the most agreeable ordeals; and if the person examined be inexperienced and the surrounding circumstances be strange, the resulting embarrassment doubtless sometimes prevents the candidate from doing full justice to his attainments. This would be very likely to occur in such an examination as the Preliminary Examination of the Pharmaceutical Society, where a large proportion of the persons examined are young, and comparatively unaccustomed to judge and act for themselves. To assist such in economizing the time at their disposal by proceeding methodically to their work, the following plain suggestions for avoiding the errors which the candidates most frequently fall into, have been prepared. We hope that they will be of service and prove the truth of the adage,—

"A word spoken in due season, how good is it!"

1. Do the work in the order set down, not beginning with English, running confusedly into arithmetic and Latin, and then finishing with English.

2. Do not throw away time by writing out the questions before the answers; put the numbers only, distinctly and carefully, leaving a small space between each answer.

3. Translate all the Latin, if it can be done readily, without taking up too much time, or such passages only as can be done.

4. Read the questions carefully, and do not give a gender when asked for a case.

5. When particular case-endings of certain nouns are required, do not decline one noun entirely.

6. When Latin examples are asked for, give them in that language, and not in English.

7. Do not say objective case in Latin, or accusative in English.

8. In arithmetic endeavour to let the working of the sums appear, keep them well apart; when the answers only are put down, let them be clear and separate; let the scribbling-papers, showing the working, accompany the answers, and do not lose time by carrying decimals *ad infinitum.*

9. In the English let the composition be written, if possible, fairly off at first, so as not to spend time in writing the same twice; attend to the orthography; select *one* subject and keep to it, not doing five or six lines upon two subjects.

10. All the previous questions being published, work them out, and ask some kind friend to examine, and, if necessary, correct the answers.

11. Each candidate should state his age as indicated.

12. By endeavouring to carry out these simple directions, candidates will not so frequently finish with "no more time."

DR. ACLAND ON THE NATIONAL HEALTH.

A NUMEROUS and influential audience assembled in the theatre of the Royal College of Physicians on Friday, the 2nd instant, to hear Dr. ACLAND's lecture on the "National Health." Few men have established a better right to be heard on this subject than the Regius Professor of Medicine in the University of Oxford. His monograph on the outbreak of cholera there in 1854; his numerous lectures and reports on drainage, on fever, on the sanitary condition of various localities, take rank among the best contributions to the science of hygiene; while their classic elegance of style has made their subject attractive in quarters rarely reached by the pure *savant.* His lecture of Friday last will very shortly be made *publici juris,* so that it will suffice for us merely to draw attention to one or two of its salient features.

Dr. ACLAND placed in a very clear light what is meant by National Health, which he defined to be, "that condition of the individuals of the nation which enables those individuals to discharge rightly their respective functions in the State, 'to do their duty in the state of life to which they are called': the statesman to be in training for exercising the complex intellectual operations of his high office; the artisan, the soldier, the abstract thinker, each for his; and if we regard the philosophic teaching of the great author of the 'Republic,' parents of either sex for the raising of the future citizens of the State." Combating the objection that "National Health" is a fiction of the mind,—that no such collective physical condition exists,—he proceeded to show that DARWIN's doctrine confirms the conviction that acquired habits, whether of body or mind, may be very permanent in a race—so permanent as to require a corresponding persistency of sanitary amelioration to eradicate them.

He drew an interesting sketch of the noble controversy which some forty years ago arose in Scotland between Dr. CHALMERS and Dr. PULTENEY ALISON as to whether the care of the sick poor and of the destitute should be left to the voluntary efforts of the benevolent, or be placed under the strict eye of the law. The latter solution of the difficulty was ALISON's, who showed, once for all, that whatever might have been the evils engendered in England under the Poor Law, the evils of destitution left to charity were greater, both to the nation and to the individual. In logical sequence on the doctrine of ALISON, we are fast reaching a further social conception that prevention of sickness is a yet more rational course than its cure; that, in fact, prevention of all disease which is not surgical, and of much disease that is surgical, is as strictly a department of medicine as treatment.

The great conditions of a nation's health were next passed in review, and the causes by which they are perverted were clearly and exhaustively set forth.

The distinguished lecturer concluded by enforcing the necessity for a sanitary State service, and congratulated his audience on the fact that Trinity College, Dublin, had just followed the example of University and of King's College, London, in adding a Professorship of State Medicine to its curriculum. Scotland will be untrue to her traditions as a promoter of medical science, if she fail to follow the example of the sister kingdom. Whatever excuse she may have had for postponing the establishment of a sanitary chair becomes every day weaker and weaker with the diffusion of such enlightened views on national health as those of their latest and most eloquent expositor, Dr. ACLAND.

THE Adulteration of Food, Drugs, etc., Bill is not to be proceeded with further this session. On the 1st instant the order for committee was discharged and the Bill withdrawn.

The Local Executive Committee of the British Association have announced that the meeting at Edinburgh will commence on Wednesday, August 2nd, under the Presidency of Sir William Thomson, M.A., LL.D., D.C.L., F.R.S.L. & E., Professor of Natural Philosophy in the University of Glasgow.

We have been favoured with a copy of the first number of a new journal of pharmacy from America. The conductors of the *Leavenworth (Kansas) Medical Herald*, considering "the intimate relations existing between medicine and its close and natural ally, the art of pharmacy," and believing that "the judgment and opinions of the educated pharmacologist must be of interest to the ambitious physician," have thought it advisable to supplement the *Medical Herald* with a department to be entitled the *Journal of Pharmacy*. We cannot say much for the originality of the articles in the first number, but doubtless when it becomes known to the Kansas pharmacists that such a journal exists, it will not be long before original communications are forthcoming. The editorship of the new journal has been entrusted to Mr. R. J. Brown, who, in his "salutatory" address, thus announces his intentions and opinions:—

"My aim shall be to make this Journal of practical use to every druggist in this section of country, and to deal in questions of special interest pertaining to the science; make such selections as will be of service to our readers, and supply the best information on all new preparations, chemicals, etc., at my command.

"I believe in the onward march of pharmacy, its growth and prosperity. The Great West throbs in sympathy with its progress, and moves forward with its schools of pharmacy in solid column.

"I shall bear the standard that shall be for the elevation and advancement of this science, encouraging a spirit of research and study, and working in harmony with all who are assisting in its progress; advocating a thorough pharmaceutical education for the young men of our country, the establishment of schools of pharmacy, where they can receive such instruction as will fit them for the responsible duties of their profession."

A project for framing a Universal Pharmacopœia for the whole of the German Empire is reported. According to the *Lancet*, a Committee is to be formed for the purpose, consisting of twelve members, of whom Prussia is to send three, Saxony, Mecklenburg and Bavaria each two, and Würtemberg, Baden and Hesse each one. The Committee will be empowered to call to their assistance men whose special knowledge may prove useful. It is anticipated that the work will be ready by the 1st of January, 1872.

We notice that the Montreal Chemists' Association has succeeded in obtaining an Act of Incorporation. This, although not of so great importance as the Act recently passed in Ontario, is a step in the right direction. About two years since an effort was made to secure an Act for the better regulation of pharmacy in the province of Quebec; but, in consequence of the great opposition offered by the medical men who, in some parts, monopolize both the prescribing and the dispensing of medicines, it was unsuccessful. At present, a person wishing to enter the business must submit to an examination by a board of examiners, consisting entirely of doctors; and the sole power of granting a licence to carry on the business is vested in the physicians. It is hoped that the educational organization in connection with the newly incorporated Society will gradually win for its members an influence that will ensure success in a future attempt at legislation.

The prosecution of the Toronto druggists for the illegal sale of poisons, to which we have referred on former occasions,* has finally resulted in the dismissal of all the cases through the absence of the informer's witness. Under the new law, which has been passed since the institution of the proceedings, such a prosecution will not be possible.

A Bill has been brought before the New York Legislature proposing to forbid the renewal of a prescription without the special order of the prescriber, but there does not appear much probability of its passing. The subject was to come on for discussion before the American Medical Association at its annual meeting in May at San Francisco. In reference to this subject, the *American Journal of Pharmacy* states that in Philadelphia several physicians have tested it practically by having on their prescription-blanks a notice that the apothecary is to retain the prescription, but not to renew it without a special order. This plan has, however, been found to be impracticable, and it is believed that the physicians have discontinued the use of these forms.

Nature reports that among other South American districts on the point of being re-worked are the Cinnabar mines of Santa Barbara in Huancavolico, in Peru, gold and silver mines in Cauca, and copper mines in Doepar, in Colombia or New Granada.

We learn from the *Journal of the Society of Arts* that a new fibre, obtained from the bark of the mulberry tree, has been produced by Mr. G. B. Marasi. It is expected that the new material will answer almost all the purposes for which hemp and flax are employed.

We read in the *Athenæum*, that a native amorphous sulphide of mercury has recently been collected in Lake County, California. Its composition is—sulphur, 13·82; mercury, 85·79. It is proposed to call this new mineral metacinnabarite.

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* See *ante*, pp. 547 and 651.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

May 30th, 1871.

Present—Messrs. Ainslie, Aitken, Baildon, Brown, Buchanan, Kemp, Young and Mackay (Secretary).

Fourteen Candidates were examined, viz. four Minor, four Modified, and six Preliminary; the following ten passed, and were declared to be duly qualified to be registered:—

MINOR (as Chemists and Druggists).

*Fingland, William, jun.	Thornhill.
Black, James	Markinch.
Beaton, William	Fraserburgh.

MODIFIED (as Chemists and Druggists).

Gavin, John	Manchester.
Ramsden, William	Fallowfield.
Richardson, Thomas James	Carlisle.

FIRST, or PRELIMINARY (as Apprentices or Students).

Chalmers, George	Edinburgh.
Gowans, James	Edinburgh.
Equal { Brown, James Macdonald	Dunfermline.
Equal { Paterson, Alexander Clarkson	Edinburgh.

The above names are arranged in order of merit.

LOCAL SECRETARIES, 1871–72.†

Aberdare	Evans, Thomas Whitty.
Aberdeen	Davidson, Charles.
Abingdon	Smith, William.
Altrincham	Holt, William Henry.
Andover	Madgwick, William B.
Ashby-de-la-Zouch	Johnson, Samuel E.
Ashton-under-Lyne	Bostock, William.
Aylesbury	Turner, John.
Banbury	Beesley, Thomas.
Banff	Ellis, Bartlet.
Barnet	Huggins, George Thomas.
Barnsley	Badger, Alfred.
Barnstaple	Goss, Samuel.
Basingstoke	Sapp, Arkas.
Bath	Pooley, John Carpenter.
Bedford	Cuthbert, John Mason.
Belfast	Reade, Oswald A.
Belper	Ashton, John.
Berwick	Carr, William Graham.
Bewdley	Newman, Robert.
Bideford	Hogg, Thomas.
Birkenhead	Nicholson, Henry.
Birmingham	Southall, William.
Blackburn	Pickup, Thomas Hartley.
Blackpool	Harrison, Joseph.
Bodmin	Williams, Joel Drew.
Bolton	Dutton, George.
Boston	Marshall, Robert.
Bradford (Yorks.)	Rogerson, Michael.
Brecon	Bright, Philip.
Bridgnorth	Deighton, Thomas Milner.
Bridlington	Forge, Christopher.
Bridport	Beach, James.
Brighton	Gwatkin, James Thomas.
Bristol	Stoddart, William W.
Bromley (Kent)	Baxter, William W.
Buckingham	Sirett, George.
Burnley	Thomas, Richard.
Bury St. Edmund's	Youngman, Edward.
Buxton	Barnett, Alexander.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Joy, Francis William.
Cardigan	Davies, David.
Carlisle	Moss, William.
Carmarthen	Davies, Richard M.
Carnarvon	Lloyd, William.
Chatham	French, Gabriel
Chelmsford	Baker, Charles Patrick.
Cheltenham	Smith, Nathaniel.
Chester	Bowles, Charles A.
Chesterfield	Greaves, Abraham.
Chichester	Long, William Elliott.
Chippenham	Westlake, Bernard.
Christchurch	Green, John.
Cirencester	Skinner, Thomas.
Cockermouth	Bowerbank, Joseph.
Colchester	Manthorp, Samuel.
Congleton	Goode, Charles.
Coventry	Wyley, John.
Croydon	Crafton, Ralph Caldwell.
Darlington	Abbott, John Thomas.
Denbigh	Edwards, William.
Derby	Frost, George.
Devizes	Clark, Robert.
Dewsbury	Gloyne, Thomas H.
Diss	Gostling, Thomas Preston.
Doncaster	Dunhill, William Workman.
Dorchester	Evans, Alfred John.
Dorking	Clark, William Williams.
Dover	Bottle, Alexander.
Droitwich	Taylor, Edmund.
Dudley	Hollier, Elliott.
Dumfries	Allan, William.
Dundee	Hardie, James.
Dunfermline	Stiell, Gavin.
Durham	Sarsfield, William.
Ealing	Barry, Thomas.
Eastbourne	Browne, Henry Robert.
Edinburgh	Mackay, John.
Elgin	Robertson, William.
Enfield	Bass, William Thomas.
Evesham	Dingley, Richard Loxley.
Exeter	Palk, John.
Eye	Bishop, Robert.
Falkirk	Murdoch, David.
Falmouth	Newman, Walter F.
Fareham	Peat, Walter.
Farnham	Clarke, Benjamin J.
Flint	Jones, Michael.
Folkestone	Cadman, Daniel Charles.
Forfar	Ranken, James A.
Frome	Harvey, William Brett.
Gainsborough	Marshall, John F.
Gateshead	Greenwell, William Crozier.
Glasgow	Kinninmont, Alexander.
Gloucester	Berry, Edward.
Goole	Hasselby, Thomas J.
Gosport	Hunter, John.
Grantham	Gamble, Richard.
Gravesend	Beaumont, William H.
Greenock	Alexander, James Gray F.
Greenwich	Tugwell, William Henry.
Grimsby, Great	Willson, Cornelius.
Guernsey	Arnold, Adolphus.
Guildford	Martin, Edward W.
Haddington	Watt, James.
Halifax	Shaw, Benjamin.
Harrogate	Coupland, Joseph.
Hartlepool	Corner, Robert.
Harwich	Bevan, Charles F.
Hastings & St. Leonards	Rossiter, Frederick.
Haverfordwest	Saunders, David P.

* Passed with Honours.

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

Hereford	Jennings, Reginald.
Hertford	Lines, George.
Hitchin	Ransom, William
Horncastle	Elsey, John.
Horsham	Williams, Philip.
Huddersfield	Higgins, Tom Sellers.
Hull	Earle, Francis.
Huntingdon	Ekins, William.
Ipswich	Anness, Samuel Richard.
Ironbridge	Hartshorn, William H. T.
Jersey	Ereaut, John, jun.
Kendal	Severs, Joseph.
Kidderminster	Bond, Charles.
Kilmarnock	Rankin, William.
King's Lynn	Atmore, George.
Kingston-on-Thames	Gould, Frederick.
Knaresborough	Sindall, John William.
Knutsford	Silvester, Joseph.
Lancaster	Wearing, William.
Launceston	Eyre, Thomas Symes.
Leamington	Jones, Samuel Urwick.
Leeds	Reynolds, Richard.
Leek	Blades, Christopher.
Leicester	Cooper, Thomas.
Leighton Buzzard	Readman, William.
Leith	Finlayson, Thomas.
Leominster	Davis, David Frederick.
Lewes	Martin, Thomas.
Lewisham	Clift, Edward.
Lincoln	Peppercorn, Benjamin.
Liskeard	Eliott, Samuel.
Liverpool	Abraham, John.
Louth	Hurst, John B.
Ludlow	Cocking, George.
Lymington	Allen, Adam U.
Macclesfield	Bates, William Isaac.
Maidenhead	Walker, Robert.
Maidstone	Oliver, Josiah.
Maldon	Wallworth, David.
Manchester, Salford, &c.	Wilkinson, William.
Margate	Knight, Alfred.
Market Harborough	Bragg, William B.
Merthyr Tydvil	Smyth, Walter.
Middlesborough	Taylor, William J.
Monmouth	White, Walter.
Montrose	Burrell, George.
Neath	Hibbert, Walter.
Newark	Harvey, John.
Newbury	Childs, Philip.
Newcastle-under-Lyme	Cartwright, William.
Newcastle-on-Tyne	Proctor, Barnard Simpson.
Newport (I. Wight)	Orchard, Herbert Joseph.
Newport (Mon.)	Pearman, Henry.
Newtown	Owen, Edward.
Northallerton	Warrior, William.
Northampton	Barry, James.
Norwich	Sutton, Francis.
Norwood	Birch, Henry Cooper.
Nottingham	Atherton, John Henry.
Odiham	Hornsby, John H.
Oldham	Hargraves, Henry Lister.
Oswestry	Smale, Richard Bill.
Oxford	Prior, George T.
Paisley	Hatrick, William.
Pembroke	John, David William.
Pembroke Dock	Andrews, Charles.
Perth	Reid, Neil.
Peterborough	Sturton, Richard.
Petersfield	Edgeler, William Bicknell.
Plymouth	Balkwill, Alfred P.
Poole	Penney, William.
Portsmouth, etc.	Rastrick, J. L. (*Southsea*)
Preston	Houghton, William.
Ramsgate	Morton, Henry.
Reading	Jameson, Walter C.
Retford	Baker, William.
Richmond (Surrey)	Hopwood, Henry J. S.
Richmond (Yorks.)	Thompson, Thomas.
Ripon	Judson, Thomas.
Rochdale	Taylor, Edward.
Rochester & Strood	Harris, Henry William.
Rothesay	Duncan, William.
Rugby	Garratt, John Colpman.
Runcorn	Whittaker, William.
Ruthin	Bancroft, John James.
Ryde (I. Wight)	Wavell, John.
Rye	Plomley, James Foulis.
St. Alban's	Davenport, Edward.
St. Andrew's	Smith, William.
St. Austell	Hern, Wm. Henry.
St. Ives' (Cornwall)	Young, Tonkin.
Salisbury	Atkins, Samuel Ralph.
Scarborough	Whitfield, John.
Selby	Colton, Thomas.
Shaftesbury	Powell, John.
Sheerness	Rayner, William.
Sheffield	Radley, William Valentine.
Shields, South	Mays, Robert J. J.
Shrewsbury	Cross, William Gowen.
Southampton	Palk, Edward.
Southport	Cumine, Frederick Hill.
Spalding	Rhodes, Frank.
Stafford	Averill, John.
Stalybridge	Brierley, Richard.
Stamford	Patterson, George.
Stirling	Duncanson, William.
Stockport	Lowndes, Hervey.
Stockton-on-Tees	Brayshay, William Bolam.
Stoke-on-Trent	Adams, Jonathan Henry.
Stourbridge	Bland, John Handel.
Stowmarket	Sutton, Charles William.
Stroud	Blake, William Frederick.
Sunderland	Nicholson, John Joseph.
Swansea	Brend, Thomas.
Sydenham	Holloway, Thomas H.
Tamworth	Allkins, Thomas Boulton.
Taunton	Prince, Henry.
Tavistock	Gill, William.
Tenby	Davies, Moses Prosser.
Tenterden	Willsher, Stephen H.
Tewkesbury	Allis, Francis.
Thirsk	Thompson, John.
Tiverton	Havill, Paul.
Torquay	Millar, F. C. Moss.
Truro	Serpell, Samuel.
Tunbridge	Wibmer, Lewis Michael.
Tunbridge Wells	Gardener, Charles.
Ulverstone	Radnall, William Henry.
Wakefield	Taylor, John.
Wallingford	Payne, Sidney.
Walsall	Highway, Henry.
Wandsworth	Nind, George.
Wareham	Randall, Thomas.
Warrington	Webster, Samuel Mather.
Warwick	Baly, James.
Watford	Chater, Jonathan.
Wednesbury	Gittoes, Samuel James.
Welshpool	Williams, T. Kemble.
Westbury	Taylor, Stephen.
Weston-super-Mare	Rich, Thomas.
Weymouth and Melcombe Regis	Mason, Arthur.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wigan	Dunsford, Samuel.
Winchester	Powell, Edward.
Windsor	Russell, Charles J. L.
Wolverhampton	Brevitt, William Yates.
Woodstock	Stubbs, Robert.
Woolwich	Rastrick, John Alfred.
Worcester	Witherington, Thomas.
Worthing	Cortis, Charles.
Wrexham	Edisbury, James Fisher.

Wycombe .... Furmston, Samuel C.
Yarmouth, Great .... Owles, James John.
York .... Davison, Ralph.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The Monthly General Meeting was held on Friday, May 12th; Mr. TOWNSEND in the chair.

The HON. SEC. reported the receipt from Joseph Ince, Esq., of two additional batches of prescriptions collected and forwarded by him for the purpose of rendering more complete the 'Book of Prescriptions' already presented to the Association.

The following letter was then read from the President, Mr. STODDART:—

"Dear Mr. Schacht,—I am sorry to say that I am prevented joining you this evening. I have sent a specimen of that curious substance metachloral, which has been mentioned by Dr. Richardson as a new hypnotic. Although isomeric with soluble chloral, it is perfectly insoluble in ether, water, and alcohol. Like common chloral, it is convertible into trichloracetic acid; and when treated with an alkali is also converted into chloroform and an alkaline formeate. It, however, differs by not being altered by hydrochloric acid and chlorate of potash.

"When common chloral is kept for some time, it changes spontaneously into the insoluble metachloral. It is more easily prepared by adding sulphuric acid to chloral hydrate, when, after standing for seven or eight hours, the metachloral separates, and may be washed with water and alcohol. The chloral becomes converted into metachloral and chloralide:—

$$\underset{\text{Chloral.}}{3\,C_2HCl_3O} = \underset{\text{Chloralide.}}{C_5H_2Cl_6O_3} + \underset{\text{Chloroform.}}{CHCl_3}.$$

the remaining chloral becoming metachloral, but unchanged as to its chemical composition.

"I have sent the specimen in water, to show its complete insolubility. On drying it and heating it to 180° C., it immediately becomes ordinary soluble chloral.

"Yours very truly,

"W. WALTER STODDART."

Mr. SCHACHT then introduced the subject of the Liquor Ferri Perchloridi Fortior and the Tincture of the British Pharmacopœia. He detailed a series of experiments, made with a view to explain the cause of the occasional change which occurs in the latter, and showed it was due to a want of sufficient chlorine in the mixture. He explained the liability to this deficiency by pointing out that the quantity of nitric acid ordered in the Pharmacopœia preparation was more than sufficient for the conversion of the iron into the condition of perchloride, and that exactly to that extent was the liability of failure, inasmuch as all excess of nitric acid went to the production of aqua regia with the free hydrochloric acid in the preparation, and thus necessarily the chlorine was lost during the subsequent evaporation. He recommended that the nitric acid be added gradually to the hot acid solution of the ferrous chloride, and only in sufficient quantity to bring about its conversion into *per*chloride, a change that is very distinctly indicated by the sudden evolution of red fumes. He believed that, attention being paid to this point in the manufacture of the liquor, the Tinctura Ferri Perchloridi of the B. P. was a better preparation than the old Tr. Ferri Sesquichlor., inasmuch as pure iron wire was more easily procured than pure peroxide of iron. This opinion was founded upon the examination of samples of the two preparations made both by himself and by other pharmacists.

Proceedings of Scientific Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

A Meeting of this Society was held on Tuesday, April 18; Professor PROCTER presided.

Professor PARRISH read a paper on Beef Extracts in Combination,* and exhibited specimens of several fluid preparations made with and without treatment for the separation of gelatine, all containing glycerine as an antiseptic ingredient. He also showed some bottles of Fleisch Extract Syrup, imported several years ago from Frankfort-on-the-Main, the contents of which had become completely solidified.

In view of the suggestion to precipitate the gelatine by means of tannin from the beef extracts of commerce, Professor Procter queried whether the animal alkaloids might not also be precipitated by tannin.

Professor MAISCH said that the Liebig Company's Extract of Meat, and some other kinds made by Liebig's formula, were free from gelatine, and would furnish fluid extracts without the necessity of resorting to the process of clarifying.

Professor PARRISH remarked that he had intended to prepare some of a similar preparation from Liebig's Extract, and would do so, and embody the result in his paper. On motion, the paper was referred for publication.

Professor PARRISH exhibited specimens of several farinaceous materials prepared by the Nutrio Manufacturing Company for domestic use and for infants' food. These were all made from wheat which had been heated to nearly 300° F., by which it loses from 10 to nearly 20 per cent. of moisture, and the starch is partially converted into dextrine and sugar. The Company is working under patents which apply in part to the apparatus for the application and regulation of the temperature. One of the chief advantages to be obtained by the extension of this branch of manufacture will be the cheapening of infants' food, now so extensively imported.

A general discussion followed on the process for making Ferrated Elixir of Bark, and the practicability of separating the tannin by hydrated peroxide of iron, the experience of members differing in regard to this.

Mr. M'INTYRE stated that if Calisaya bark is treated with a very dilute alcoholic menstruum, and the tincture then mixed with the hydrated oxide, it would cease to blacken with soluble salts of iron. He stated that he used pyrophosphate of iron as the principal salt in the elixir, and overcame the green tint by a small addition of solution of citrate of iron. He had also diluted the officinal fluid extract of cinchona with good success, instead of starting with the bark itself. He had found the solution of chloride of iron convenient for precipitating the hydrated oxide with ammonia, on account of the great facility of washing out the very soluble muriate of ammonia from the magma.

Professor MAISCH expressed his preference for the Cinchona alkaloids in making this elixir, and stated his conviction that few, if any, of the principal manufacturers used the bark itself, or even the alkaloids, in sufficient proportion to impart much of the tonic property of Cinchona. He stated the proportion of his elixir as follows, using a chinoidin, which contains much quinia and quinidia, 90 grains to O viiiss, $9\frac{1}{2}$ grains of pyrophosphate are contained in each fluid ounce.

A general discussion followed as to the propriety of preparing elixirs to meet the popular demand, or to fill the prescriptions of physicians. Professor Maisch's custom is to make all such as are required in the course of his business, and to decline prescriptions which call for special proprietary preparations. Professor Procter prefers sending to the physician for the formula in all cases in which there is uncertainty as to the composition designed, and dispensing such as are well known. Professor Parrish's practice is to originate a formula in any

* See p. 985.

case in which there is none published, taking into account the proper doses and pharmaceutical requirements of the ingredients, but in no case selling one of his own where another is evidently intended to be prescribed.

Mr. GAILARD exhibited a specimen of Whitman's Cacao Butter, of fine quality, used by him in making suppositories.

Professor MAISCH called attention to the fact that the fusing-point of this oil is generally stated to be at about 90° F.,* while common experience shows that suppositories made with it, without admixture, will retain their shape reasonably well throughout the hot summers of the United States.

The preparation of suppositories being under discussion, the method of preparing them without fusion was adverted to.

Professor PROCTER stated that he had practised that method on their first introduction, but noticed a difference in the facility of manipulating them according to the temperature of the hands of different persons; while some could form a suppository without inconvenient fusion, others would have the mass become too soft to handle.

Professor Procter exhibited the remains of the retort, the explosion of which killed the late Ferris Bringhurst, together with the curved piece of iron taken from his brain, measuring about $1\frac{1}{2}$ inches in length by about 1 inch in width by $\frac{1}{2}$ inch in thickness.

Professor MAISCH gave the result of his analysis of several samples of assafœtida taken by the drug inspector of the port from different cases and from different parts of the mass, with the following result:—

	No. 1.	No. 2.	No. 11.	No. 18.	No. 20.
Oleoresin	34·25	41·47	61·80	37·86	28·88
Alcoholic resin	2·23	2·42	1·13	1·62	1·20
Total resin and vol. oil	36·48	43·89	62·93	39·48	30·08
Impurities	57·50	44·01	15·20	51·70	62·09
Gum moisture and loss	6·02	12·10	21·87	8·82	7·83
	100·00	100·00	100·00	100·00	100·00

These were samples of amygdaloid assafœtida which a year ago was rejected by the purchaser as adulterated, he claiming that good assafœtida should be entirely free from sulphate of lime. The impurities in the above instance consist of gypsum and vegetable fragments, as always met with in the resinous matter agglutinating the tears.

MASSACHUSETTS COLLEGE OF PHARMACY.

The Third Annual "Commencement" of the Massachusetts College of Pharmacy was held in Boston, on May 18th. The President, Mr. S. C. COLCORD, in his opening address, said that the students were from thirty to forty in number, with three professors. The Institution suffered from the want of suitable rooms, and at present he thought apothecaries did not take sufficient interest in it, but he hoped the time would come when the College would compare well with that at Philadelphia.

Professor J. BABCOCK then read a portion of two selected theses by members of the graduating class, on "Citrate of Iron and Quinine," by Mr. Beale, and "Capsicum, with Assays of its Commercial Powder," by Mr. Drury. The reading of the theses was supplemented by some remarks upon the importance of assays in discovering adulterations in drugs. A valuable hydrometer was then presented to Mr. Drury for proficiency in his studies.

A valedictory address was delivered by Professor G. F. H. MARKOE. He spoke of the new and enlarged field of action upon which, in the enjoyment of their professional rights, the students were about to enter. As pharmaceutists, he said, they must still continue students, especially of chemistry and botany. By devoting their leisure hours to the study of science, they would ennoble their characters and elevate their profession. They should look well to the details of their art, bearing in mind that what was worth doing at all was worth doing well. The pharmacist should carefully avoid invading the domain of medicine. The professions should be kept carefully distinct. Either one affords scope for the best abilities, and there is no excuse for the practice of both by the same person. He exhorted the graduates to remember the importance of their duties and acquit themselves like men.

The Rev. J. M. MANNING then delivered an address. The subject of pharmacy, he said, was one in which all people were interested, and there were some considerations in respect to it which clergymen, although not familiar with the science, might enforce. As Shylock said of the Jews, so it is with clergymen, if you poisoned them they died. The quality and preparation of medicines were of the utmost importance, as blunders and mistakes by apothecaries could not be risked. Lawyers might sometimes, after a case had been lost, seek redress for their clients in a higher court, and clergymen could restate their doctrines if in one Sunday's sermon they had been a little top-heavy, but there was no chance for a second experiment with the apothecary. He ought also to know how to stock his shelves and to stand between the public and the importers of drugs. Adulterations in articles of food might be endured occasionally, but it was necessary that the pharmacist should be ever ready and able to protect the public against harmful mixtures. Such knowledge and skill being required, the next question was how to prepare men for the profession. He did not think that men who were preoccupied or were enthusiasts on any subject were fit to be pharmacists. Keenness of touch, delicate eyesight, a nice sense of smell, and an exquisite perception by taste were necessary for the skilful performance of his duties. No one should be allowed to attempt practising until he was acquainted with every detail and item of his duties; therefore, the College of Pharmacy was indispensable, and he was surprised that no one had yet thought of endowing such an institution in Boston. As to the question whether pharmacy should be regarded as a trade or a profession, the point he made was that it did not make so much difference what it was called, provided the work was honestly and well done. Just in proportion as they maintained their integrity the calling would be elevated. He also thought that the pharmacist could not be too careful in entering the inviting field of dealing in patent medicines.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY .. ...*Royal Medical and Chirurgical Society*, at
June 13. 8.30 P.M.
Photographic Society, at 8 P.M.

WEDNESDAY ...*Microscopical Society*, at 8 P.M.

THURSDAY ......*Royal Society*, at 8.30 P.M.
June 15. *Chemical Society*, at 8 P.M. — "An Experimental Inquiry as to the Action of Electricity on Oxygen." By Sir B. C. Brodie.
Linnean Society, at 8 P.M.

FRIDAY ....*Society of Arts*, at 8 P.M.—Annual Conversazione at the South Kensington Museum.
June 16. *Royal Botanic Society*, at 4 P.M.—"Economic Botany." By Professor Bentley.

The following journals have been received:—The 'British Medical Journal,' June 3; the 'Medical Times and Gazette,' June 3; the 'Lancet,' June 3; the 'Medical Press and Circular,' June 7; 'Nature,' June 1; the 'Chemical News,' June 3; 'Gardeners' Chronicle,' June 3; 'Journal of the Society of Arts,' June 3; the 'Grocer,' June 3; 'Produce Markets Review,' June 3; the 'English Mechanic,' June 3; 'Proceedings of the Royal Institution;' 'Journal of Materia Medica' for May.

* Watts' 'Dictionary of Chemistry' gives 30° C. (86° F.)

Parliamentary and Law Proceedings.

Court of Queen's Bench, Westminster, *5th June.*

Ex parte Whisken.

This was an application on the part of a chemist and druggist, at Welshpool, for a *mandamus* to compel the Pharmaceutical Society to restore his name to the Register. It was alleged that he had a right to be registered, and the applicant made affidavit that previous to, and at the time of the passing of the Pharmacy Act, 1868, he kept an open shop for the making up of medicines.

The Court granted a rule *nisi.*

The applicant in this case had been sued for penalties, and the case was to come on for trial in the Welshpool County Court on Thursday, June 8.

In due course the whole case will be submitted to the Court.

Central Criminal Court, *6th June.*

Robbery of Saffron.

William Hall, warehouseman; John Adams, labourer; and George Robinson, chemist, were charged with feloniously breaking and entering the warehouse of Charles Brumleu, and stealing 200 lb. weight of saffron, value £250, his property.

The prosecutor is a drug merchant. On the night of the 17th April, a warehouse in Billiter Street, belonging to him, was broken into, and a large quantity of saffron stolen. When the prisoners were taken into custody, it was found that they had been dealing with the stolen property immediately after the robbery, and offering it for sale at prices far below its real value.

The jury returned a verdict of feloniously receiving against Hale, and acquitted the other two prisoners, believing that they had acted innocently under the direction of Hale. The Recorder sentenced Hale to eighteen months' imprisonment with hard labour.

Alfred Hughes, who carried on the business of a chemist in the Hackney Road, was also charged with being implicated in the transaction, but while in custody at the police station he attempted to commit suicide by cutting his throat, and has since died.

Attempted Suicide by Vermin Killer.

On Wednesday, May 17, the wife of a pensioner living at Freston, in Suffolk, made a determined attempt to commit suicide, having, while taking her tea, swallowed a large quantity of Battle's Vermin Killer. The woman became very ill, and symptoms of poison being very evident, medical assistance was obtained. She is likely to recover.

Suicide by Arsenic.

An inquest was held at Bethnal Green on Tuesday, June 6, on the body of William Perry, who had died from the effects of arsenical poisoning. Deceased was a carman out of work, and had lately been in a very desponding state. He had been selling arsenic to chance customers recently, and his wife believed he had stolen it. He told her that he was afraid the police would take him up, and the same night he poisoned himself with some of it. A card, with an address in the City Road, was found, and on inquiries being instituted, the deceased was stated to be an agent to a shop engaged to sell arsenic and other drugs. Mrs. Jackson, the owner of the shop, said that she had in her possession 28 lb. of arsenic from the time of the death of her husband seventeen years ago. She expressed great surprise when told that she was liable to pay a fine. The jury returned a verdict of "Suicide while of unsound mind," and the coroner ordered the police to take the case in hand.—*Standard.*

HOUSE OF COMMONS.

Adulteration of Food, Drugs, etc., Bill.—*Thursday, June 1st.*—The order for committing the Adulteration of Food, Drugs, etc., Bill was read and discharged, and the Bill withdrawn.

In answer to a question concerning the adulteration of tea, put by Lord E. Cecil on Friday, the Chancellor of the Exchequer said no regulations could be made to require custom-house officers to detain tea suspected of adulteration under the present law, neither would he take upon himself to recommend the enactment of a law to provide for making such regulations, because such a course would render the customs more unpopular than they were, and would not prevent adulteration by the retailer.

Weights and Measures.—*Friday, 2nd June.*—In answer to Mr. Read, Mr. Chichester Fortescue said he had hoped to bring in a Bill dealing with the whole subject of weights and measures this session, but in the present state of public business he did not see a prospect of securing the attention of the House to so complicated a subject. He added, that neither the Select Committee of 1862, nor the Royal Standards Commission, recommended the compulsory introduction of the metric system; the Royal Commission, however, recommended its permissive introduction.

Obituary.

DR. JAMES WATSON.

Medicine has lost an able practitioner, and Glasgow a valuable citizen, in Dr. James Watson, who died on the 30th ult. The deceased gentleman, after an unusually thorough curriculum of study, was admitted a Fellow of the Faculty of Physicians and Surgeons in 1810. In 1842, he was appointed one of the physicians to the Royal Infirmary and to the Fever Hospital in Clyde Street. He was three times elected President of the Faculty of Physicians and Surgeons, by whom he was fondly termed the "Father of the Faculty," on the ground, not only of his seniority, but of the paternal interest he took in the welfare of the Corporation. The Faculty, as a further mark of the esteem in which they held him, hung his portrait in their Hall, and founded the prize which bears his name. No department of medicine, whether in its diagnostic or in its pharmaceutical aspect, escaped his intelligent recognition; and in his capacity as member of the General Medical Council of the United Kingdom he did valuable service in elevating the standard of preliminary education for all aspirants to professional practice.

BOOKS RECEIVED.

Companion to the Last Edition of the British Pharmacopœia, comparing the Strength of its various Preparations with those of the London, Edinburgh, Dublin, United States and other Foreign Pharmacopœias, with Practical Hints on Prescribing. By Peter Squire, F.L.S. Eighth Edition. London: J. and A. Churchill. 1871.

Contributions towards the Materia Medica and Natural History of China, for the Use of Medical Missionaries and Native Medical Students. By Frederick Porter Smith, M.B. London, Medical Missionary in Central China. Shanghai: American Presbyterian Mission Press. London: Trübner and Co., 60, Paternoster Row. 1871.

On the Curability of Cancer and its Medical Treatment without Surgical Operation. By Dr. G. von Schmitt. London: Wyman and Sons. 1871.

Notes and Queries.

**** In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[228.]—SYRUPUS TONICUS.—It was not till I read in a recent Journal Mr. Woolley's reply to query 228 that I was aware the name "tonic syrup" (originated by myself some five or six years since) had passed the limits of this town. As, however, it appears to have done so, I will trespass on your space with a brief explanation of its origin and the formula for the same.

About the time indicated above, a physician suggested to me that the formula for syr. ferri et quinæ et strychniæ phosph. might probably be altered with advantage, some of his patients having complained of its acidity or extreme bitterness, others of its tendency to change before they had taken the quantity prescribed. With this view I made several experiments, resulting in the adoption of the following formula:—

℞. Ferri Sulph. ʒv
Sodæ Phosph. ʒv
Sodæ Acetat. ʒj
Quinæ Sulph. gr. 192
Liq. Ammoniæ q. s.
Acid. Sulph. Dil. q. s.
Aquæ Dest. q. s.
Strychniæ gr. vj
Acid. Phosph. Dil. ℥x
Sacch. Alb. ℥xx
Aq. Aurantii ℥iv.

Manipulate as in the original formula.

The points of difference are, the use of sodæ acet. with the phosph. in precipitating the iron, diminution in the quantity of acid. phosph. and increase of sugar and addition of aq. aurantii. The proportions of iron, quinine and strychnine are the same as in Easton's syrup. But it became desirable to distinguish between the two (many medical men adhering to the old form). The name tonic syrup seemed suitable and short, in the same way that "chemical food" is used to indicate Parrish's syrup. This syrup is more pleasant to take, and its keeping qualities enhanced, but I still find it desirable to preserve it in small bottles (2 or 4 oz.), well stoppered, quite full and in the dark.—CHARLES SYMES, *York Place, Birkenhead.*

[236.]—BROMIDE OF POTASSIUM.—I am quite disposed to agree with the remarks made by ED. PHARM. JOURN. I have known cases of ʒss to ʒiss ordered for a dose.—W. C. H.

BORAX AND BLACKBEETLES.—Two closets in different rooms in my business premises were infested with this pest. Every likely remedy had been tried, including brushing over their haunts with a strong solution of corrosive sublimate, but in vain. I accidentally saw from an American source that borax was a cure. I tried it by sprinkling it freely in these closets, and where formerly scores could have been seen at any time, not one can now be found, and I concluded they were poisoned. A few days since, however, finding some in a cask, I had them caught and put into a box with some borax. It did not kill them; but, for my part, I am quite contented that, whether dead or alive, they have quite disappeared.—H. C. B.

[256.]—LIQUID COCHINEAL.—I should feel obliged by your asking for a recipe for liquid cochineal?—TOL PEDN PENWITH.

[*** Several formulæ have been given in the Journal, though it appears there is still a want of one for a preparation that will keep well.—ED. PHARM. JOURN.]

[257.]—GINGER BEER POWDER.—*H. B.* would be glad of a formula for making ginger beer powder, sufficient for two gallons in a packet.

[258.]—ESSENTIAL OILS OF MYRRH AND WAX.—Can any of your readers inform me, where in London or elsewhere, I can meet with the essential oils of myrrh and wax? I have tried everywhere, but without success.—A. S.

[*** We are informed that Messrs. Trepte and Ferko, of Leipzig, in their long list of essential oils, offer "myrrhenöl ächt." By oil of wax, it is presumed that the empyreumatic oil of wax, the preparation of which is described in many old books (as Ph. Lond. 1721), is intended, but it is not a thing to be found in the shops.—ED. PHARM. JOURN.].

[259.]—DRYING SALVE.—Can any one give me a good form for a drying salve for cows?—UNGUENTUM.

[*** Probably the information would be found in a work on veterinary pharmacy.—ED. PHARM. JOURN.]

[260.]—PASTILLES GUIMAUVES.—*Z. and Y.* is desirous of obtaining a formula for preparing pastilles guimauves.

LOCAL APPLICATIONS IN SMALL-POX.—At a recent meeting of the Société de Thérapeutique, M. Deliou stated that the plan which he had found to succeed best was the application of a mixture of collodion and castor oil, with the addition of 1-100th of bichloride of mercury.—*Practitioner.*

GANTEINE FOR CLEANING KID GLOVES.—
White Soap 250 parts
Water 155 parts.
Dissolve with heat, cool, and add—
Eau de Jarelle, 165 parts
Solution of Ammonia 10 parts.
The whole to be ground together until a smooth paste is formed. A little of this is rubbed over the glove with a piece of flannel.—*New York Druggists' Circular.*

VANILLA FLAVOUR.—A correspondent of the *New York Druggists' Circular* says that, having tried various methods of extracting all the virtue of the vanilla, he has found none to answer so well as the following:—
Take Vanilla Beans 1 oz.
White Sugar 1 oz.
Triturate in an iron mortar until reduced to a pulpy mass, then pack in a conical glass percolator, and pour on it 8 oz. of neutral sweet spirits, heated by a water-bath in a lightly stoppered bottle to the temperature of 125° F. When this has passed, change the receptacle, and repeat the process with the same quantity of sweet spirits; lastly, mix the percolates.

DUTCH DROPS OR HAARLEM DROPS.—There is a considerable difference in the ingredients and quality of these long-celebrated drops, but the most common preparation, perhaps, is according to the following formula:—
Take Balsam of Turpentine 2 oz.
Oil of Turpentine 10 oz.
Mix. The genuine drops are the residuum of the rectification of oil of turpentine.—*New York Druggists' Circular.*

PRESERVATION OF ERGOT.—Ergot is injured from being eaten by a minute insect of the *Acarus* genus, which appears to have a liking for damaged rye, among, perhaps, many other things to it not less palatable. As it has an aversion, however, to many pungent things, it may be kept away by putting in the vessel that contans the ergot a few drops of the oil of cloves, or a few cloves themselves, or cardamom seeds or camphor. If well dried before corking up, ergot may in this manner be preserved for several years.—*New York Druggists' Circular.*

UTILIZATION OF RESIDUE IN MAKING TINCTURE OF MYRRH.—Mr. E. B. Shuttleworth, the editor of the *Canadian Pharmaceutical Journal*, having noticed the large amount of residue in making tincture of myrrh according to the British Pharmacopœia, was induced to attempt to utilize it. From fifty-two pounds of the residue of percolation, dissolved in boiling water, strained, and allowed to deposit, he obtained twelve gallons of mucilage, forming an excellent substitute for paste, and possessing unlimited keeping qualities. Although scarcely so adhesive as mucilage of gum arabic, this latter property may be obtained by the addition of a little molasses.

Correspondence.

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

Poison Regulations.

Sir,—I beg the favour of your inserting copy of the accompanying correspondence in relation to a letter published in the Journal of June 3rd.

Clifton, June 6th, 1871. Richard W. Giles.

(Copy.)

Clifton, June 3rd, 1871.

Sir,—Permit me to ask what you wish to be understood from your letter in the current No. of the Pharmaceutical Journal, headed "Poison Regulations." Allow me also to direct your attention to a letter in the Journal of May 13th, signed by Mr. Baldock, who seconded the amendment proposed by myself at the Annual Meeting, to which amendment your letter appears to point.

Your reply is requested for the purpose of inserting it in the next No. of the Journal, and I shall therefore feel obliged if you will favour me with it as early as possible.

Your obedient servant,

Barnard S. Proctor, Esq. Richard W. Giles.
Newcastle-on-Tyne.

(Copy.)

Grey Street Newcastle-on-Tyne.

Dear Sir,—I have just received your note, and in reply, all I wish to be understood by my few lines in last No. of Journal is that it is dangerous to have any "tacit understandings;" they are as slippery as ghosts and about as indefinite.

Yours truly,

R. W. Giles, Esq. Barnard S. Proctor.

Sir,—In your last number Mr. Hucklebridge advocates the use of a red band of colour as the simplest and most efficient check against mistakes.

Now as I decidedly differ from him on this point (whilst agreeing with the rest of the letter), it will not perhaps be unfair to endeavour to turn his own illustration against him.

Let me ask now if the lady whose finger had been so very rudely used for a tobacco stopper, had been anxious to guard against the repetition of such a mistake, would she have been more likely to effect this by colouring the top of her finger red, or by wearing two or three rings with sharp points or roughened edges properly placed?

Having written so recently on poison regulations, I should not have troubled you again, only I think the distinction drawn is worthy of consideration.

W. C. H.

Sir,—I have a strong feeling against the "Poison Bottle." I fear that such a bottle becoming familiar in households will be used for general purposes. There is a general reluctance to smashing a bottle of whatever kind, and when the sign of danger becomes familiar it loses its caution. The Poison-Bottle may be used for an innocent medicine (or other contents), and this practice may lead to awful mistakes, because the sign of poison being associated thus with an innocent medicine may lead to the swallowing of poison instead of the innocent medicine, as both may be in the same kind of bottle.

To pay for a bottle or phial, so long as one has a bottle or phial fit for the purpose in hand, is "against the grain," and there is a too common trust in mere remembrance as the reconciliation for departure from strict propriety.

Common beer-bottles are used for furniture oil, and ink (and I know of a mistake of a serious nature caused thereby), and even vitriol, and I have seen a castor-oil bottle used for ardent spirits. I have seen blacking-bottles hardly distinguishable from stone ginger-beer bottles, and, so far as I know, the one bottle was used for both purposes, from the reluctance to pay for the proper bottle.

Suppose a "stingy" man, or a "hard up" man, or an *economical* (!) man, wants something in a bottle, for which bottle he must pay if he have not one. Suppose he has a "poison-bottle," and gets that filled with non-poisonous contents, what is the harm? It is this, that trusting to the familiar use of such a bottle, he may be some day off his guard and use a "poison-bottle," *with poison in it*, believing he is using the innocent stuff.

I believe in a poison-bottle only if it can change its character when the poison is no longer in it, and is so decidedly alarming in appearance, while the poison is in it, that even in the dark its characteristic warning will be FELT.

The nearest approach to such a thing, that I now conceive, is a broad black tape tied round the neck of every bottle containing poison (whether as stock in the shop, or dispensed), and that such tape shall have two long ends hanging down over the bottle. When such a poison-bottle is no longer used for poison the tape can be removed, and the bottle looked upon as a safe bottle. The deliberate removal of the tape will be the surety that the poison also is removed (unless criminality is involved), and the familiar idea of poison also removed, leaving such a symbol with its full terrors when seen.

The accidentally removable "Poison" *label* would not only be there (subject to obliteration), but there would tenaciously remain a peculiar symbol of poison, which only deliberation or design could remove, while, for convenience, when no poison existed, the removal of the tape (impossible by ordinary accident) would restore the washed bottle to a common purpose.

I hold that the symbol of poison should vanish with the poison.

Alfred W. P. Smith.

Edinburgh, May 31st, 1871.

Poisons in Surgeries.

Sir,—Just now as there is a deal of agitation respecting the manner in which chemists store their poisonous preparations, it may not be out of place to say a few words respecting the way in which surgeons keep their preparations.

As a traveller for a provincial wholesale drug house, I have good opportunity for observing the manner in which their preparations are stored in their surgeries.

In the first place, I frequently find the bottles, pots, etc. labelled very illegibly and imperfectly; and as regards their juxtaposition, you will find ext. belladon. and ext. anthem. embracing each other; whilst on the other hand, tinct. opii, liq. ammoniæ and sp. æther. nit. are close companions with lin. belladon., lin. aconit. and tinct. rhei. co., in fact they are jumbled together in hopeless confusion; and when this is coupled with the bits of scribbled paper stuck on by way of apology for a label, I am surprised that fatal mistakes do not occur more frequently than they appear to do.

I do not wish to say one word against our surgeons which they do not deserve, but we know that sometimes "very unfavourable symptoms set in," or perhaps "the fever is increased with wonderful rapidity," or something of that sort.

Lycopodium.

The Benevolent Fund.

Sir,—Much has been written on this subject lately, some of it in a spirit likely to do good, and some with a very different tendency, for I cannot think that the cynical, conceited, dogmatic tone adopted by some correspondents, whose chief aim appears to be to make themselves very prominent in everything,—if not by popularity, then by notoriety,—can elicit any good result.

I fully agree with the sentiments of "*Henricus.*" There are some people who, in these matters, not only "let their right hand know what their left hand doeth," but they seem little pleased if everybody else does not know it too. I am quite willing that they should be gratified, even by having their names embalmed in printer's ink with heavier type than those of their less magnanimous neighbours, if that can be conveniently carried out; but let them be satisfied with their own distinction, and concern themselves less about others. When they ask that the names of others shall be printed in a manner to show that they do not subscribe as much as Mr. Biglittle, I think they are asking what they have no right to ask, and what they would not like others to ask if they were differently concerned. There are many who have not yet subscribed to the Benevolent Fund, and others who have contributed only small sums, simply because they cannot afford to do more, but who are not a whit less generous or well-disposed towards it than some who give a little more, and accompany it with so much ostentation. Few of us can afford to help others much, whatever may be our desires, and therefore let the more prosperous ask their less fortunate brethren for subscriptions with some consideration for their feelings, or they will annoy and disgust many more than they will win to subscribe.

After thus freely expressing my opinion, I will venture to suggest for consideration one small way of increasing the Fund; which is, that instead of free admission to the annual conversazione, a small charge should be made for the tickets —not less than a shilling, and not more than half-a-crown— the money so obtained to be given unreduced to the said fund.

I believe everybody would pay it, not only without grumbling, but with pleasure, knowing the purpose to which it would be applied.

Whether I may be able to attend or not, I will pledge myself always to pay for one if not for two.

If this suggestion is objectionable, possibly it may prompt others to think of some way more acceptable.

I will just add that, notwithstanding the twitting manner in which the words "our active Registrar" are quoted, after some little personal experience of him, I do not think the adjective misapplied, but think it would be well if we all were as "active" in our own business, and as little "active" in that of other people as "our active Registrar." SALT.

Sir,—I am surprised to see a process of intimidation suggested as a means of getting subscribers. This will never do, it must be left to every man's conscience what he can or will give in any work of charity. And as far as my experience goes, I do not believe there are many who can be frightened into liberality.

On the other hand, the Fund certainly has a claim upon every chemist and druggist throughout the land. Let circulars be sent to the local secretaries throughout the country, for distribution. In these circulars let the attention of the trade be solicited to the benefits and requirements of this Institution. Let those who are not members of the Pharmaceutical Society be requested to become so. I do not think the entrance fee unjust or unreasonable (certainly I paid it myself without any scruple). The annual subscription is moderate enough for the advantages conferred in return; especially if exemption from jury service be added, which in all reason and equity ought to be the case.

Some who would not become members, might be induced to be subscribers to the Benevolent.

I am firmly convinced that a great deal might be done in this way, from personal experience during the time I was connected with the United Society.

And another part of my experience is this, that there are few occupations in life where there is a greater likelihood of pecuniary assistance being required by deserving members than in that of a chemist and druggist.

ONE WHO HAS KNOWN THE DRUG TRADE MORE THAN THIRTY YEARS.

PHARMACEUTICAL EXAMINATIONS.

Sir,—In answer to your correspondent of the 20th inst., though I cannot point out the advantages I will endeavour to give him a few of the disadvantages of those who have passed the Major Examination, and also been some few months in the Laboratory studying practical chemistry.

If my memory does not fail me, some few years since, at a special General Meeting of the Society, it was stated that the Council had no intention of again opening the door of admission except by examination. Now, Sir, I and many others took the Council at their word, and after going through the due course of training at Bloomsbury Square, passed the examinations; and how has the Society rewarded us for our simple faith? Our best means of explanation will be to take two fellow-apprentices just free from their bonds, both with £500: the one goes forth as an assistant, and by that means adds a little to his store, whereas the other thirsting after a knowledge of the articles that daily pass through his hands, wends his way towards Bloomsbury Square, where we find him, day after day, ruminating over Fownes, Bentley, Royle, Bowman, etc., and, after months of careful training, passes the Major, and receives a certificate.

We again find our two friends brought face to face, when they wish to commence business; granting them to be both of equal business tact and perseverance, the one who turned his back on the Society is able to buy a very much better business than the Major Associate, but of this he did not complain, and only asked to be left with his knowledge and title to fight the battle for himself; but here steps across his path the foster-mother to whom he had been taught to look up, and who he had fondly hoped would prove the lever that would raise him some little above his non-examined neighbour. She not only folds her arms round his opponent, but gives him a title quite equal to his own, and from which the public cannot distinguish the difference. What we, who have been led to part with our money, ask, or rather demand is, that all who have passed the Major shall have some title which will distinguish them from those who have passed into the Society through another gate, and I would suggest Fellows of the Pharmaceutical College—F.P.C.

Perhaps some may think this picture overdrawn, but I can only tell them I am writing from practical experience.

May 31st, 1871. F. P. C.

Sir,—I cannot agree with your correspondent "*Forward*," that he, having passed the Modified Examination, should be allowed to skip the Preliminary.

I suppose I may infer, that the Modified men are alarmed at the number of examinations they have to undergo. I would suggest, the Council might make the path easier for them in this way, viz. when they have passed the Preliminary, to allow them to go on for the Major.

I do not think that any one should or could attain the title of pharmacist without having knowledge of the kind necessary to pass the Preliminary, so that it would be no hardship, but the reverse to require him to undergo the test previously.

If the Council were to make the Modified an equivalent to the Minor, when the Preliminary is passed, it would remove any cause for grumbling.

There would be no injustice done to those who have passed the Minor, as the Modified men are placed on the same footing with them in other respects already, for which I think the latter gentlemen have cause to be thankful.

Birkenhead, June 5th, 1871. J. H. K.

DRUGGISTS' PRICES.

Sir,—A week or ten days ago I was offered 1*s*. 3*d*. for a ℥xij effervescing mixture and xij carb. soda powder and bottle, but declined; it was an old prescription, but no chemist's name appeared on it. I was informed that it had been dispensed scores of times for 1*s*. in the North.

Peterborough. STEPHEN WILLSON.

Sir,—I know of a retail doctor at the east of London who doles out a child's powder for the low charge of 1*d*. where chemists charge 1½*d*. each, and whose equipage would not disgrace a West-End M.D., with a pair of handsome grey horses and three fine spotted carriage dogs to follow in the rear; and this very same doctor, moreover, is principal agent—"the London depot"—of the wonderful "Elixir of strength."—"it gives strength to the weak and makes the aged forget their infirmities, and restores manhood to the most shattered constitution"—"nervousness more speedily cured by the elixir than by any agency yet discovered."—"N.B. This renowned medicine will keep in all climates; no vessel should proceed to sea without having a supply on board"—"The glory of man is strength"—"Agents: all registered chemists throughout the civilized world"—"Copyright entr. Sta. Hall, April 21, 1865." Trade mark, or words elixir of strength." What medical man of sensibility and education would not say Bosh to this glaring trash? This is a specimen of the degrading trade done by a doctor even in London, as well as Glasgow.

I have troubled you with rather a long "ditty," with hope against hope that it may put shame in the conscience of the accused and teach them to desist from so encroaching and low a scale of trading; which will fully reward your obedient servant with others of his brethren. BO-PEEP.

May 30th, 1871.

Druggists' Prices North of the Tweed.

Sir,—Your correspondent "*R. G. H.*" makes reference in last Saturday's Journal to a retail price list, which, he states, has been drawn up on this side of "the border." I consider it my duty as Secretary to the Glasgow Association to state that so far as that body is concerned, they have had no hand in its compilation; they have not countenanced in any way the dispensing of a one-ounce mixture for fourpence, nor have they suppressed the origin of the list issued by their authority.

James M. Fairlie,
Hon. Sec. Glasgow Chemists' Association.
St. George's Cross, Glasgow, 5th June, 1871.

Sir,—"*R. G. H.*" (Bradford) is quite entitled to sneer at our prices, but we cannot allow him to misrepresent them. He quotes ℥i, ℥iss ℥ij mixtures 4*d.*, 6*d.* and 8*d.* respectively (it should be ℥i, 4*d.* to 6*d.*), and afterwards deducts 2½*d.* for bottles, etc., to estimate how much is left for skilled labour. Will it be believed that immediately above the line he quotes, there stands "all prices exclusive of bottles"? and that ℥i, ℥iss, ℥ij phials are priced 2*d.* each in the same price list.

Edinburgh. A. N.

The Chemists' Club.

Sir,—I was extremely pleased with the suggestion of "*Subscriber*" on the above subject in the Journal, and as he invites the opinions of those interested, I with much pleasure volunteer mine.

I think that if a club were established under the control of our Council, possessing the necessary accommodation for country members visiting the metropolis, for students coming up for examinations or attending the laboratories, or for assistants seeking situations, also to be used as a resort for London members and assistants, it would be an advantage, the necessity of which has long been felt, and which would be much appreciated, and would do much, I am sure, to further a feeling of fraternity and good-fellowship among our brother members.

I think a nominal annual subscription, together with a moderate charge for accommodation, would be quite a success, and that few indeed of our members, in town or country, would withhold from subscribing to so useful an institution. I hope to hear the opinions of other gentlemen, and that it may be well considered and discussed.

One who would gladly Subscribe.

Inspection of Weights and Measures.

Sir,—It has often occurred to my mind whether chemists and druggists are really liable to be visited by inspectors of weights and measures, and I now beg leave to put forth this question through your valuable Journal, if you will kindly allow me so to do. It does appear by the enclosed old list that there are copies of the imperial standard weights in 8-dram, 4-dram, 2-dram, 1-dram and ½-dram; consequently all using these weights in way of trading are subject to be called upon by these officials; even all dispensing chemists, as well as doctors and surgeons who retail. M. P. S.

A Medley.

℞. Potass. Bicarb. ʒij
Ammon. Carb. ʒss
Liq. Ammon. Acet. ℥j
Sp. Etheris Nitr. ʒiss
" " Chlor. ʒj
Vini Ipecac. ʒj
Liq. Cinchon. (Battley) ʒiij
Syr. Scillæ ℥ss
Aquæ ad ℥viij.

M. Capt. partm. 6tam c. ℥ss succ. limon. ter die in statu effervescentia.

The above is the prescriber's usual remedy for coughs and colds, sometimes omitting liq. cinchon., and in one case omitting it, but adding—

Sp. Ammon. Co. ʒiij
Liq. Taraxaci ʒvj.

Highgate. Alf. Marshall.

C. A. Threadgale.—The answer to the question "if the calling of a chemist and druggist is a profession" will depend mainly upon the way in which that calling is pursued. Our correspondent will see some pertinent remarks on the question at page 999.

F. H. W.—(1.) We believe that the rule would be to use the Pharmacopœia preparation. (2.) We are not aware that Mr. Wilson has a preference for any particular aqua mellis.

"*Hydrargyrum.*"—The stain may be removed by heating the button carefully in a glass-tube until the mercury is volatilized.

M. M. L.—You are quite correct in your supposition.

J. Hooge.—One of the best books for preparing for the Minor Examination in the subject mentioned is Garrod's 'Essentials of Materia Medica.' There are also a good work by Scoresby-Jackson, a new edition of which has been published recently, and Farre's Abridgment of Pereira's Materia Medica.

"*Ferment.*"—Pasteur's papers on Fermentation were published in the 'Comptes-Rendus des Séances de l'Académie des Sciences.'

F. Liley.—The temperature would be about 180° F.

"*Cyathus.*"—We have already given, at p. 878, a few receipes similar to those you ask for, but it requires only a small amount of pharmaceutical ingenuity to produce any of the flavouring syrups used for aerated drinks.

C. S.—A precipitate must be produced if the medicine be dispensed according to the prescription, and if there be the proper amount of quinine in the ferro-citrate.

"*Aquila*" had better write to the editor of the *Hairdressers' Chronicle.*

"*Dubitas.*"—If the preparation be kept, it is liable to explode.

A. P. S. (Liverpool).—(1.) We do not know of any authority for preferring one kind to another. There is a considerable difference in the price. (2.) The results obtained appear to be of sufficient interest and importance to justify their being made the subject of a paper, and we shall be glad to open the inquiry by publishing them in the Journal in that form.

"*Amygdala.*"—A solution containing one scruple in one ounce of water will keep at ordinary temperatures.

W. Morgan.—We are obliged for the information, and will place it at the disposal of future inquirers.

A. P. S.—The question has already been asked, but has not yet been answered.

"*Capsicum.*"—Probably because rectified spirit of wine is the better solvent of the active principles.

A. Barron.—(1.) The most trustworthy test for chloral hydrate is the production of chloroform by the action of alkalies upon it, but the method of using the test would depend upon circumstances. (2.) We have noticed the coloration spoken of, but are not aware of the cause. Probably it is due to some slight impurity in the preparation.

S. Maskery.—If the pills were put up in boxes containing more than a dose, we think that the label would be liable.

"*Stucco.*"—The action is due to oxidation of the spirit vapour induced by the spongy platinum and generating sufficient heat to keep the platinum red-hot and evaporate the perfume.

"*Gulielmus.*"—We think the label is liable as referring to a remedy for a disorder, and giving directions for use.

G. W.—Mix seven parts of water with one part of the acid referred to.

H. W. H.—The article mentioned is a proprietary one, and we are therefore unable to give the formula for its preparation.

"*Inquirer.*"—We know of no authorized formula.

"*Alpha.*"—You would probably find the information in a work on perfumery.

G. H. Strickland.—The amount is very small and variable.

Erratum.—In last week's Journal, p. 983, col. 29, line 17 from top, *for* "utmost entire absence" *read* "almost entire absence."

Communications, Letters, etc., have been received from Mr. S. Wilson, Mr. J. H. Kay, Mr. J. Edwards, Mr. E. H. Strickland, Mr. D. Hanbury, Mr. R. Manlove, Report of the Nottingham and Notts Chemists' Association, H., "Spes," "Investigatio," "Minor," "Associate."

NOTE ON HYDROCYANATE OF MORPHIA.

BY PROFESSOR J. M. MAISCH.

Among the descriptions of morphia salts, as furnished by various chemists, the hydrocyanate is not enumerated. In Gmelin's 'Chemistry' some double hydrocyanates are mentioned, but not the simple morphia salt; and, as far as I know, nothing is known of its formation or its properties.

A prescription having been received, calling for 1 grain each of acetate of morphia and cyanide of potassium in a 3-oz. mixture, the separation of needles was observed before the medicine was handed out; they were removed by straining, and found to be a salt of morphia. Although granulated cyanide of potassium was used, it was still possible that this salt might have been impure, and the formation of the crystals due to some impurity.

Pure hydrocyanic acid was therefore neutralized with ammonia, and the aqueous liquid diluted, so that it contained in each fluid drachm 1 grain of pure cyanide of ammonium. This solution was experimented with like the solution of cyanide of potassium. The following contains the results of the experiments thus far obtained:—

1. A neutral solution of a morphia salt, even if diluted to the proportion of 1 : 1500 (1 grain in 3½ oz.), yields with a neutral cyanide a crystalline precipitate consisting of hydrocyanate of morphia.

2. After the crystals have separated, the filtrate, acidulated with nitric acid, yields no precipitate with iodohydrargyrate of potassium; the morphia hydrocyanate, therefore, if soluble at all, dissolves but very sparingly in water.

3. The solubility of the morphia hydrocyanate appears not to be increased by an excess of the precipitant.

4. The precipitate is readily dissolved if the liquid is slightly acidulated by a mineral acid; it is likewise soluble in acetic acid, and for this reason does not appear in a mixture containing syrup of squill.

5. Hydrocyanic acid does not precipitate a neutral solution of morphia.

It is obvious from the foregoing that morphia salts ought not to be prescribed simultaneously with neutral cyanides, except enough acid be added to retain the hydrocyanate of morphia in solution.—*Amer. Journ. Pharmacy.*

LIQUOR PLUMBI SUBACETATIS.

BY STEWART KELLAM, OF GALVESTON, TEXAS.*

As it is of considerable interest to the pharmaceutist to know the strength of the basic acetate of lead of the different Pharmacopœias, I have, in the laboratory of Dr. F. A. Genth, carefully prepared the different samples, and have examined them with reference to their specific gravity, and the amount of oxide of lead which they contain. The materials used for such preparations were first examined qualitatively. The acetate of lead was in thick, stout crystalline masses; the interior brilliant, and only the outside slightly coated with a more basic acetate; it was free from copper, and contained no other impurities.

The litharge, on the contrary, was of far less purity. I have examined six samples from different sources; they all contained carbonic acid and minute traces of silver; two of them also metallic lead, and red oxide of lead; two were contaminated with oxides of iron and copper, with alumina and lime; and the other two showed, besides the impurities mentioned, silicic acid and teroxide of antimony. As it is so very easy to obtain the pure oxide of lead by the calcination of the pure carbonate, it is advisable to prepare always the pure oxide for pharmaceutical preparations. I have prepared my solutions of the subacetate, both with the purest of the examined samples of commercial litharge, and with chemically pure oxide of lead.

1. Prepared according to the Pharmacopœia Badensis:—190 parts of sugar of lead are digested with 222 parts of oxide. I have tried the process by digesting, in a close flask, 12 grms. of acetate of lead with 14 grms. of litharge and 60 c. c. of distilled water for two days. The mixture, after a short time, had assumed a thick, pasty consistence, from the formation of a large percentage of the so-called $\frac{1}{6}$ acetate, and yielded such a small proportion of liquid that further experiments were not made.

2. According to the Prussian Pharmacopœia:—3 parts of acetate of lead are digested in a close flask for one or two days, with one part of litharge and 10 parts of water, and filtering the product after cooling, which then should have a specific gravity of 1·235 to 1·240.

An experiment made with 18 grms. acetate of lead, 6 grms. of litharge and 60 c. c. of water (distilled) gave, after digestion and filtration of the small quantity of undissolved basic acetate, a clear liquid, which, however, after several days, deposited a slight precipitate. The specific gravity was found to be 1·238, and 19·3255 grms. of the liquid gave, when precipitated with sulphuric acid, and after the expulsion of the liberated acetic acid by evaporation, 5·0258 grms. sulphate lead, equal to 19·14 per cent. of oxide of lead.

3. The Bavarian Pharmacopœia takes, for three parts of acetate of lead, one part of litharge and eight parts of water, and boils down the mixture till the liquid has acquired a specific gravity of 1·360. According to Wittstein ('Chemisch-Pharmaceutische Praeparate'), it is easier and better, and yielding the same result, to take only one-half the quantity of water. My experiment was made according to Wittstein, and 18 grms. of acetate of lead, with 6 grms. of oxide of lead, were digested with 33 grms. of water, and, after filtration, gave a clear liquid of 1·376 specific gravity. 12·5856 grms. gave 4·8464 grms. sulphate of lead, equal to 28·34 per cent. of oxide of lead.

4. The Pharmacopœia Gallica uses the same proportions of acetate and oxide of lead as the Bavarian; hence I did not deem it necessary to repeat my experiments with these proportions.

5. The Pharmacopœia Britannica prepares the liquor plumbi subacetatis by taking 5 oz. (avoird.) of acetate of lead, 3½ ounces of litharge, and one imperial pint of distilled water; boils for half an hour, constantly stirring the mixture; filters after cooling, and adds water to make the product 20 ounces. The specific gravity is 1·260.

In my experiment I have taken 20 grms. of acetate of lead, 14 grms. of litharge and 60 grms. of water, and added to the product the required quantity of water to produce 60 grms. of liquid. The specific gravity in my experiment was considerably higher, and found to be 1·353. 18·0218 grms. gave

* An Inaugural Essay upon passing the examination for the degree of Graduate in Pharmacy of the Philadelphia College of Pharmacy.

6·5408 grms. sulphate lead, equal to 26·71 per cent. of oxide of lead.

6. Several experiments were made with the process recommended in the U. S. Pharmacopœia, with commercial litharge as well as with chemically pure oxide of lead, and, for comparison with these, others by using the cold process recommended by M. Nerning.*

1. *Hot process.*—The required specific gravity of the product is 1·267.

A. I boiled for half an hour 16 grms. of acetate of lead with 9·5 grms. of litharge and 64 grms. of distilled water. The product was a clear liquid of 1·265 specific gravity. 9·5588 grms. gave 2·9403 grms. of sulphate of lead, or 22·64 per cent. of oxide of lead.

B. The same proportions of ingredients were used, but c. p. oxide of lead in the place of litharge. The specific gravity of the product was 1·234. 14·2815 grms. gave 3·7053 grms. of sulphate of lead, equal to 19·09 per cent. of oxide of lead.

C. A repetition of the last experiment with a sample of acetate of lead from another source, gave a liquid of 1·230 specific gravity, 11·4528 grms. of which gave 2·9068 grms. sulphate of lead, equal to 18·68 per cent. of oxide of lead.

II. *Cold process.*—The same proportions of the requisite substances were allowed to remain, with frequent agitation, in contact for twenty-four hours, and in experiment *a*, made with litharge, gave a liquid of 1·243 specific gravity, of which 19·3736 grms. gave 5·2476 grms. sulphate of lead, which is equal to 19·93 per cent. of oxide of lead.

B. repeated with c. p. oxide of lead, I obtained a liquid of 1·242 specific gravity, of which 15·2463 grms. gave 4·1196 grms. of sulphate of lead, or 19·88 per cent. of oxide of lead.

C. A third experiment, which was made with acetate of lead from another source, yielded a liquid of 1·220 specific gravity. 13·14 grms. of the same gave 3·23 grms. of sulphate of lead, which represents 18·09 per cent. of oxide of lead.

From these experiments it will be seen that the liquores plumbi subacetatis obtained by the different Pharmacopœias yield very different products, but also that the same process gave products of not exactly the same composition; and as always the same care has been used in each case, I cannot account for differences of nearly 2 per cent. in the amount of oxide of lead (as has been found between No. 6, II A. and C.), otherwise than that the very low temperature at the time of the preparation of *C.* is the cause of this and other discrepancies.

As a general observation I will add, that the preparations made in the cold appear to keep better than those obtained by boiling, the latter more readily depositing basic salts.—*Amer. Journ. Pharmacy.*

* Pharm. Journ. July 9th, 1870, from *Journ. de Pharmacie et de Chimie.*

NOTES ON BIRD OILS.

BY P. L. SIMMONDS.

Among the animal oils or fats, that of birds has been the least investigated, probably because it is so seldom met with in commerce, and yet there are some quarters where various kinds have economic and medicinal uses. Goose grease is perhaps the only one which with us has a domestic reputation as an emollient for chapped hands, etc. As Mr. Stanford has recently drawn attention to the fulmar oil in the Journal, a few notes as to the uses and commerce in other oils or fats from birds may probably lead to further investigations and a careful examination of any useful properties they may possess.

The Penguin (*Diomedia chilensis*) in the Falkland Islands is chiefly sought after for its oil, deriving its name from its pinguidity or excessive fatness. On the islands of the Falkland group these birds are found in millions, and schooners, with a gang of twelve or fifteen men, go there solely for boiling down the oil of the birds. The fat of eleven birds skimmed gives about one gallon of oil, and each schooner or gang of men will return to Stanley, after a month or six weeks' campaign, with from 25,000 to 30,000 gallons of oil. This oil, which comes chiefly to London, is used, I believe, for currying leather only. I have sent Mr. Stanford and the museum of the Society specimens of this oil. It varies in colour according to the time it has been boiled.

Another bird oil largely sought for in the islands of Bass's Straits and New Zealand, is from what is called locally the mutton bird (*Procellaria obscura*). Large quantities of oil are obtained from the young birds. The body is pressed and the oil runs from the mouth, each bird yielding about half a gill. The oil is reputed to possess considerable virtue as a liniment in cases of rheumatism. The fat, when clean, is pure white and looks like goose fat, but the taste is rather oily; however, it may be used for a good many purposes other than for food. It burns very well in small, shallow tin lamps, which get warmed by the light and melt the fat.

Father Labat (Nouv. Voy. tome vi. p. 395) speaks of the virtues of the grease or fat of the frigate bird. It is said to be an admirable specific in the sciatica, and in numbness of the limbs and other ailments arising from a want of circulation. The grease is to be heated, and while it is on the fire, the parts affected are to be well rubbed and chafed in order to open the pores, and some good brandy or spirits of wine are to be mixed with the fat immediately before it is applied. A piece of blotting-paper steeped in this mixture may be laid on the part, with compresses and a bandage to keep it in its place.

Mother Carey's chickens (*Procellaria pelagica*) are killed in quantities at the Western Islands for their oil. They are so plump that the islanders merely draw a candle-wick through the body, and it becomes so saturated with the liquid fat as to form a lamp without further process.

Ostrich fat has much local repute. The first care of the sportsman after securing his bird, is to remove the skin, so as to preserve the feathers uninjured; the next is to melt down the fat and pour it into bags formed out of the skin of the thigh and leg, strongly tied at the lower end. The grease of an ostrich in good condition fills both its legs, and as it brings three times the price of common butter, it is considered no despicable part of the game. It is not only eaten with bread and used in the preparation of kooskoos and other articles of food, but the Arabs reckon it a valuable remedy in various maladies. In rheumatic attacks, for instance, they rub it on the part affected till it penetrates thoroughly; then lay the patient in the burning sand, with his head carefully protected. A profuse perspiration comes on, and the cure is complete. In bilious disorders, the grease is slightly warmed, mixed with salt and administered as a potion. It acts thus as a powerful aperient, and causes great emaciation for the time; but, according to the Arabs, the patient, having thus been relieved from all the bad humours in his body, afterwards acquires robust health and his sight becomes singularly good.

The grease of the emu, or Australian ostrich (*Dromaius Novæ-Hollandiæ*) is held in great esteem by both colonists and natives as a cure of bruises and rheumatism. The skin of the bird produces six or seven quarts of a clear, beautiful, bright yellow inodorous oil. The method of obtaining the oil is to pluck the feathers, cut the skin into pieces and boil it.

At one of the Madras Industrial Exhibitions, oil from peacocks' fat in Tinnevelly was shown, but it was not stated to what use it was applied.

In South America, in the immense cavern of Guacharo, in the government of Cumana, Humboldt describes an extensive pursuit carried on of a bird for its fat by the Indians. This cave is peopled by millions of nocturnal birds (*Steatornis caripensis*), a new species of the *Caprimulgis* of Linnæus. About midsummer the young birds are slaughtered by thousands. The peritonæum is found loaded with fat, and a layer of the same substance reaches from the abdomen to the vent, forming a kind of cushion between the hind legs. Humboldt remarks that this quantity of fat in frugivorous animals not exposed to the light, and exerting but little muscular motion, brings to mind what has been long observed in the fattening of geese and oxen. It is well known, he adds, how favourable darkness and repose are to this process. The fat of the young birds is melted in clay pots over a brushwood fire. It is half liquid, transparent, inodorous, and so pure that it will keep above a year without turning rancid.*

The passenger pigeons (*Columba migratoria*) of North America are another source of oil. They migrate at certain seasons in millions, and the Indians, watching their roosting-places in the forests, knock them on the head in the night and bring them away by thousands. The Indians preserve the oil or fat, which they use instead of butter. There was formerly scarcely any little Indian village in the interior where a hundred gallons of this oil might not at any time be purchased. The squabs, or young pigeons, when taken in quantity, are also melted down by the settlers as a substitute for butter or lard.

* Bonnycastle's 'South America.'

AJWAN OR OMUM.

(*Ptychotis ajowan.*)

BY M. C. COOKE, M.A.

One of the drugs included in the new Indian Pharmacopœia, which is unknown in European practice but has doubtless intrinsic merit to recommend it, is the one which heads this notice. The seeds, or more accurately the fruits, of several umbelliferous plants are well known and appreciated, but the Omum has, somehow, escaped regard. It may be that it has no virtues which are not possessed in an equal degree by others, yet a notice and a few observations on its uses will not be altogether out of place.

The vernacular names collected and verified by Mr. Moodeen Sheriff are—*Kamúne-muluki*, Arabic; *Nankhah* and *Zinyan*, Persian; *Ajvayan*, Hindustani; *Ajvan*, Dukhni; *Omam*, Tamul; *Omamu* or *Vamamu*, Telegu; *Ayamodakam* and *Homam*, Malayalim; *Voma*, Canarese; *Ajvain* or *Ajvan*, Bengali; *Vova-sada* and *Vova*, Mahratta; *Ajwan*, Gujerati; *Assamodagun* or *Omam*, Cinghalese; and *Samhum*, Burmese.

The fruits are smaller than caraways or any umbelliferous fruits employed in Europe, and there

Fruits of Ajwan (*Ptychotis ajowan*).

is no record of their ever having been offered for sale in our markets. The plant itself is thus described:—

"Stem erect, dichotomous; leaves few, cut into numerous linear or filiform segments, the uppermost simply pinnate; umbel with 7–9 rays; involucre few-leaved; leaflets linear, entire; fruit strongly ribbed, covered with small blunt tubercles." Figured in the second volume of Wight's 'Icones,' plate 566. Roxburgh says, "This is one of the most useful and at the same time grateful of the umbelliferous tribe. It is much cultivated in Bengal during the cold season. I never saw it wild. The seeds, like those of caraway, have an aromatic smell and warm pungent taste; they are much used by both natives and Europeans for culinary and medicinal uses; they are amongst the smallest of the umbelliferous order, and are to be met with in every market in India."*

Mr. Wood says, in his remarks on this drug,† "I have good reason, indeed, to remember the effects of the omum, for on one occasion, when a boy, I was attacked at midnight with a severe fit of colic (the only severe one I recollect to have ever suffered from), brought on by indulging in fruit. No medical aid was at hand, and the only remedy given me was the omum seed, which I was directed to chew and wash down with water, which was not only followed by speedy but complete relief." And in another part of the same communication he adds, "While at Vizagapatam some few years ago, I remember to have seen, during a pretty sharp outbreak of cholera, the richer classes of the people purchasing the omum water and distributing it wherever required."

By the natives of India, the omum or ajowan is constantly used in all sudden derangements of the *primæ viæ*, such as vomiting, diarrhœa, colic, flatulence, etc.; in the premonitory diarrhœa of cholera, and often in the unmistakable cholera itself; and testimony is not wanting to show that it is sometimes at least as useful a medicine in the earlier

* Roxburgh: 'Flora Indica,' vol. ii. p. 91.

† The 'Madras Quarterly Journal of Medical Science,' Oct. 1862, p. 294.

stages of the last-mentioned disease as many other more costly ones.

In some forms of dyspepsia, in the vomiting, griping, or diarrhœa from errors in diet, in simple flatulence and even tympanites, in faintness and exhaustion, in choleraic diarrhœa, in certain cases of colic and in hysteria, it has been found, even when given alone, pre-eminently useful.

From all that is known of this medicine it appears to combine the stimulant quality of capsicum or mustard, the bitter property of kreata, and the anti-spasmodic virtues of asafœtida.

The seed, or fruit, is one of the forms of administration by the natives; another is in decoction with sundry other aromatics, namely, ginger, sweet flag, galanga, etc., but it is evident this is not a good form. A distilled water, under the names of 'Sison Cordial' and 'Omum Water,' is sold at many of the dispensaries and shops about the country. Another preparation called "Sugar of Omum" is to be had in Madras. It has the appearance of candy, and though probably a little more expensive, is much more efficacious and agreeable than the water. Mr. Lynsdale gives the following directions as to quantity for distillation:—"To one viss (or 3 lb.) of the bruised seed, add six bottles of water and distil over four. In the necks of these bottles will be found the oil, amounting to about ℥ss." The Bengal Pharmacopœia directs two gallons of water to one of the Ajwan, distilling over one gallon.

The Pharmacopœia of India gives the following,—"Take of Ajwain fruit, bruised, twenty ounces, water two gallons; distil a gallon. Dose, from one to two fluid ounces." There is not probably, in the city of Madras and its suburbs, a single Eurasian family who, if they have not some of the omum water at home (and numbers have), have not used it at some time or other, or at least heard of its virtues. And it is not in Madras alone that it is so extensively used by the middle classes of society, but in many of the larger cantonments up-country it is pretty well known. Further, with very few exceptions indeed, the so-called seed of the omum is to be found among the domestic medicines of both Mahomedan and Hindoo families, and is looked upon as the *sine quâ non* of remedies in many affections.

The "sugar of omum" alluded to above is evidently the same as in the Pharmacopœia of India is called *Ajwain-ka-phul*, said to be sold in the bazaars of the Deccan, Scinde, etc., and is prepared in Central India during the cold season. It is also stated to form spontaneously on the surface of the distilled water of Ajwan. Dr. Stenhouse examined and found it to be a Stearopten (see PHARM. JOURN. 1855, Vol. XIV. p. 272).

ON THE PREPARATION OF SUPPOSITORIES.

BY WILLIAM G. EWING.

I have read most of the articles that have appeared in the *Amer. Journ. Pharmacy* for several years upon the subject of suppositories, and have gained many valuable suggestions from Messrs. J. B. Moore, Charles L. Eberle and others; but I have fallen upon a process not alluded to by any of them, that greatly facilitates this tedious, and sometimes very difficult and troublesome class of prescriptions. The plan I have adopted is as follows:—

First, procure a large, coarse tin grater,—such as may be had of any tinner,—and with it grate the cacao butter into a coarse powder, pass through sieve No. 20, and put it into a wide-mouthed bottle ready for use; next, take some pure white wax, grate, sift, bottle, and set it aside in the same manner as above. The fragments that will not pass through the sieve can be melted and grated again after cooling. With these two substances on hand, the prescriptionist is prepared for any formula in the suppository line.

The management of the melting-point of suppositories has been a matter of great difficulty, annoyance and delay, varying as it does with the seasons; but with this grated material we have a ready means of regulating it at will; for if the mass should be too hard,—as in winter,—the addition of a little olive oil will be found advantageous; or, if too soft,—as in summer,—the addition of the grated wax will bring it to the right consistence. In addition to the above ready means of controlling the melting-point, it has the advantage of being much more easily manipulated. For instance, take the following suppository from the U. S. Dispensatory, 13th edition, viz.:—

℞	Tannic Acid	grs.	36
	Benzoated Lard	„	44
	White Wax	„	10
	Oil of Theobroma. . . .	„	90

The directions are to melt the wax and oil of theobroma with a gentle heat and add the tannic acid and benzoated lard, previously rubbed together in a mortar, and mix all the ingredients thoroughly; pour the mixture, while it is still fluid, into suitable moulds of the capacity of 15 grains, or the fluid mixture may be allowed to cool, and then divided into twelve equal parts, each of which shall be made into a conical or other convenient form for a suppository.

The above formula is easily expressed, but not so easily complied with in all cases, owing to the variable nature of the oil of theobroma, and also to the temperature of the season; but, accepting it as it stands, the advantage of the grated wax and cacao butter is very perceptible, since, instead of melting one portion together, and rubbing the other portion in a mortar as prescribed, the whole may be at once mixed and rubbed together in a mortar, forming a plastic mass as easily rolled into lengths and divided as an ordinary pill mass; and each piece formed by the fingers into a conical shape, or, if desirable, pressed into suitable moulds previously dusted with lycopodium, as suggested by Mr. J. B. Moore. The following is a copy of a far more difficult prescription that was brought to me by a patient to be filled one very warm night:—

℞	Carbolic Acid	grs. xxx
	Cacao Butter	℥iss.

Mix and make suppositories No. 10.

Here the prescriptionist is in a dilemma. If the carbolic acid and cacao butter are melted together, they will not solidify on cooling; if wax be melted with the mixture, considerable time is occupied in adjusting the proportions, as it is necessary to test it by allowing portions to cool from time to time, and adding wax by degrees until the proper consistence is attained; meanwhile the carbolic acid is evaporating and the efficacy of the suppositories being impaired. Having the grated materials at hand, and no other resource but to add a sufficiency of wax, it was immediately and easily done by rubbing it in until the proper consistence was attained, the amount of wax required being 70 grains; the prescription was much more quickly dispensed than by any of the usual methods, and as there was no heat employed in the process there could have been no evaporation of the carbolic acid. In the above case, the grated wax and carbolic acid were first well rubbed together and the cacao butter added last.

As no allowance was made for the addition of wax, the size of each suppository was slightly increased (though not materially) and, as each contained the exact proportion of its active ingredient, the design of the prescription was executed. The weight of each suppository might have been left unchanged by omitting enough cacao butter to balance the wax that was added.

It is needless to repeat examples, though many difficult ones might be given from actual experience; it is sufficient to state a few general principles.

When dry substances are prescribed, they should be reduced to fine powders (if not already so), then thoroughly incorporated with the grated cacao butter, and rubbed in a mortar until the mixture becomes a plastic mass easily rolled into lengths, divided and formed into suppositories. Should moist substances, such as extracts or any articles not dry, be prescribed, they may be rubbed first with about an equal bulk of the grated cacao butter, and afterwards readily combined with the remaining ingredients.

As a general rule, all substances used in medicating suppositories must be either in the state of a fine powder or a uniform paste; the prescriptionist must decide upon the more easily attainable state.

The advantages of using the cacao butter in the grated state are numerous. It furnishes the means of easy manipulation, of readily adjusting the melting-point, of avoiding the delay of melting and cooling, and the use of ice which is not always procurable, of thorough and perfect incorporation of its ingredients, of exactness with which the mass may be divided; besides the satisfaction it gives the prescriptionist of *knowing* that no separation nor subsidence of any of its ingredients can possibly take place, which certainly cannot be felt when the substance is *melted* and moulded.—*American Journal of Pharmacy.*

THE CRYSTALLIZATION OF CAMPHOR.

BY R. ROTHER.

The peculiar predilection of camphor for the crystalline form, is one of the petty annoyances inherent to the dispensing department. Insignificant as the objection may seem, it is nevertheless one for which the dispensing pharmaceutist is but too willing to accept a remedy. This difficulty is chiefly experienced with powdered camphor, but the objection, likewise, though in a less obvious degree, applies to the aqueous solution. The most perfect means of pulverizing camphor, although not the most practicable, is undoubtedly the method by precipitation. The trituration with small quantities of chloroform, ether, benzine, and naphtha, has been proposed; but none of these substances possess any advantages over alcohol, which even still is preferable to all. There is no difficulty whatever in pulverizing camphor, the object is to retain it so.

For this purpose it has been suggested to triturate the camphor with small quantities of magnesium carbonate. If this management ensured the pulverulent state indefinitely, the magnesium would often be objectionable. The writer has not tested the process, but was informed by good authority that it is not satisfactory; a similar result is experienced by precipitating the camphor with water from an alcoholic solution, holding the magnesium carbonate in suspension. Other dry substances, as starch, for instance, have been used with equally indifferent success. The writer, feeling the necessity of some alternative, and basing his theory of this crystallization upon the volatility of camphor, applied an ethereal solution of resin with a view of coating the particles with a deposit of resin. The experiment, however, yielded a negative result. The writer, assuming then that a non-volatile solvent might retard the crystallization, employed a small proportion of fixed oil—preferably castor oil. This addition is entirely unobjectionable, and although it does not strictly meet the most sanguine expectation of preventing crystallization, it yet modifies this tendency to such a degree that after a long trial the writer is so thoroughly satisfied with its peculiar advantages that the complete success of the experiment would have been scarcely hailed with more delight. The proportion of castor oil employed is about one part in thirty of camphor, or even less. It is added, together with the alcohol, to the camphor, and the whole triturated to the proper degree of fineness. The great advantage rests in the fact that the crystals of camphor subsequently formed are exceedingly minute, and that the oil entirely removes the very disagreeable adhesiveness and tenacity of the camphor, which becomes so troublesome during the trituration of pure camphor. Camphor containing the oil can be triturated in large or small quantities, without in the least clogging the mortar or pestle. The powder, after keeping even a long time, mixes perfectly and with facility with all the ordinary ingredients with which it is usually combined in prescriptions. The peculiar gumminess has been perfectly removed by the intervention of the oil.

The aqueous solution of camphor is another point at issue. It has been supposed that during cold weather camphor water drops part of its camphor. However, this phenomenon is only apparent. The writer has often been struck by the extraordinary solvent power of very cold water upon camphor, so that during the coldest winter weather the cold water drawn fresh from the hydrant, and having a very low temperature, always yielded the strongest camphor-water, which, when subjected to the warm temperature of the room, deposited camphor abundantly and in weighable quantities, not upon the glass above the liquid, but floating in beautiful crystals in the liquid itself; so much so, that the water was often filtered again before use.

To verify the above conclusion, the writer employed lukewarm water. The camphor was first finely triturated with the aid of alcohol, then with the magnesium carbonate, first rubbed through a coarse sieve, then with a portion of the water, and poured into a capacious bottle; the remainder of the water was then gradually added, and the mixture violently shaken during the intervals, and finally filtered. (This is essentially the writer's manipulation for the aromatic waters.) The bottle containing the filtrate was securely corked and allowed to cool. After six hours a very thin film of crystalline camphor had deposited on the walls of the bottle above the liquid, the latter containing no visible trace, not even floating upon the surface. The liquid was again filtered and exposed to intense cold for a long time, but no more camphor separated, although the liquid possessed the taste of camphor in a marked degree. Therefore, to make camphor-water, free from separated camphor, use lukewarm water, or use water of the ordinary temperature, let it become equalized to the temperature of the room, and, after a repose of twenty-four hours, filter. But to make a supersaturated camphor-water, employ water having a very low temperature.—*The Pharmacist.*

THE CHEMISTRY OF CALICO PRINTING.

BY JAMES BLAIR.

(*Continued from page* 992.)

Pigment Colours.—These consist essentially, first, of the colouring-matter to be printed; secondly, of the fixing material; and thirdly, of the thickening necessary to give the colour consistence, and to prevent the running or spreading of the colour, and so the spoiling of the figure to be printed.

Insoluble Colours.—The principal insoluble colours are—ultramarine, Guignot's green, chromate of lead, prussian blue, brown earths, aniline black and lakes, of the colouring principles of Persian berries, logwood, cochineal, etc. with iron, alumina and oxide of tin.

Soluble Paint Colours.—These are chiefly the Aniline colours, viz. magentas, blues, mauves, violets, green, orange, scarlet and brown.

The Phenol Colours.—Azuline blue, rosolic acid and peonine; these separately, or mixed, furnish most of the required shades.

Aniline black is produced by the action of a salt of copper (the sulphide is generally used) on hydrochlorate of aniline. It is a very intense and fast colour.

Lampblack, digested in strong sulphuric acid and then washed free from acid by cold water, has also been used as a black pigment. A black pigment is also obtained by precipitating a slightly ammoniacal decoction of logwood by a salt of iron, such as the nitrate of iron, and washing the resulting precipitate of hemateate of iron with cold water until free from impurities.

Guignot's green (sesquioxide of chromium) is prepared by heating to dull redness a mixture of three parts of boracic acid and one part of bichromate of potash. The mixture swells and becomes of a very fine green colour. The mass is then lixiviated with water to remove the borate of potash, and the sesquioxide of chromium finely pulverized is ready for use. In the preparation of this colour, too high a pressure, causing fusing of the mass, must be guarded against, as the colour is thereby entirely destroyed, an olive-green gloss being obtained in its place.

Mauve colours are produced by the action of bichromate of potash, hypochlorite of lime and chloride of tin on solutions of salts of aniline.

Magenta.—This name is applied to several of the salts of rosaniline,—the acetate and the hydrochlorate of rosaniline.

Rosaniline $C_{20}H_{19}N_3$ is produced by the action of various oxidizing agents on a mixture of aniline and toluidine. The best result is obtained by heating a mixture of 70 per cent. of toluidine and 30 per cent. of aniline at a temperature of 190° F., until the production of colour is complete. The resulting product is impure arseniate of rosaniline, from solutions of which the rosaniline may be obtained by precipitation by an alkali. Arseniate, acetate and hydrochlorate of rosaniline are soluble in water and alcohol and yield very fine pink colours.

Blue and violet are obtained by heating salts of rosaniline with aniline, and with many of the alcohol radicals, as phenyl, ethyl, methyl, etc., the alcohol radical taking the place of hydrogen.

Amine, or rosolic acid, is produced by heating at 140° 6 parts of carbolic acid, 4 parts of oxalic acid and 3 parts of sulphuric acid. It is soluble in alcohol and yields golden-yellow and orange shades.

Peonine is produced by prolonged heating of aurine with a large excess of ammonia. This colour yields shades of crimson.

These colours, by themselves or mixed, yield most shades required.

For example:—

Pt. Lavender.—Mauve + indigo extract.

„ Drab.—Logwood pulp + $\left(\text{Brown} \left\{ \begin{matrix} \text{yellow pulp} \\ \text{magenta} \end{matrix} \right\} \right)$ buff liquor $\left\{ \begin{matrix} FeOSO_3 \\ PbOA \end{matrix} \right\}$

„ Stone.—The above + ultramarine.

„ Brown.—Berry pulp, magenta, pt. purple.

„ Slate.—Indigo extract, magenta, black pulp.

Thickenings.—Wheat starch, or gum tragacanth.

Fixing Agents.—Blood or egg albumen, dissolved in water at 3 to 6 lb. per gallon, and used = 1 to 2 lb. albumen per gallon of colour; caseine and gluten are also used as fixing agents.

Steam Colours.—In these colours the ingredients are mixed in such a manner that they are soluble when printed, and so penetrate the fibre, but, on being submitted to steam, chemical action takes place and an insoluble colour is formed on the fibre. It is sometimes very difficult to meet this condition, but it is sometimes effected by leaving out an essential ingredient from the colour and preparing the cloth with it previous to printing; indeed, as this preparation is found beneficial to most colours of this class, it is usually adopted, and is called steam prepare.

Steam Prepare.—The goods are padded in a solution of stannate of soda, at $\left\{ \begin{matrix} 11° \\ 5° \\ 3° \end{matrix} \right\}$ Tw., according to the kind of cloth and the colours likely to be printed on it. The cloth is then dried and beamed, after passing through weak acid and washing.

Black.—Logwood liquor, 4½ gallons at 12° + iron liquor, 2 gallons at 12°; starch, 12 lb.; boil and cool, then add iron liquor, 1¼ gallons, at 32°; Fe Cl, 1 quart, at 80°.

Chocolate.—Logwood liquor, 6¾ gallons + starch, 13 lb. + 4 B. B. gum $\left\{ \begin{matrix} \text{3 quarts berry liquor, at 80°} \\ \text{8 lb. alum} \end{matrix} \right\}$ $\left\{ \begin{matrix} \text{8 lb. red prussiate of potash} \\ \text{1½ gallons water.} \end{matrix} \right\}$

U. Red.—Sapan, wood liquor, nitrate of alum, $KOClO_5$, alum, bark liquor, water starch.

R. Blue.— $\left\{ \begin{matrix} \text{Water} \\ \text{Gum} \\ \text{Starch} \end{matrix} \right\}$ $\left\{ \begin{matrix} \text{Tartaric} \\ \text{Oxalic} \end{matrix} \right\}$ $\left\{ \begin{matrix} NH_3Cl \\ \text{Blue pulp} \end{matrix} \right\}$ $\left\{ \begin{matrix} \text{Yellow and red pulp} \\ \text{Concentrated } SO_3. \end{matrix} \right\}$

Green.—Blue + berry liquor + $SnCl_2$, or else + bark liquor.

Lavender.—Logwood, boiled in red liquor + oxalic acid or + red prussiate = purple.

Amber.—Berry liquor with oxide of tin.

Brown.—Catechu, 4 lb.; acetic acid, 2½ pints + $NaOCO_2$, 2 lb., in 1 gallon water; when used, add 1 pint $CuONO_5$, at 102° Tw.

The colours are printed and dried in the same manner as paint colours; and as the after treatment of these two kinds of colours differs much from that of the mordanted colours, we will follow them to completion. The printed goods, whether paints or steams, are loosely reeled, wrapped in a stout blanket and hung up in a strong iron chamber, where they are subjected to a pressure of steam for one hour, which in the case of paints fixes the colour by coagulating the albumen; and, in the case of steams, developes as well as fixes the colours. The goods are then opened out and exposed to the air to cool, washed with water, sometimes slightly soaped and dried. They are then cleared.

CONVERSAZIONE OF THE ROYAL COLLEGE OF PHYSICIANS.

The Royal College of Physicians held a Conversazione on Wednesday evening. The attendance was numerous enough to be almost oppressive; the libraries and the dining room, where refreshments were served, being at one time so full that there was barely standing space. The objects of interest were judiciously selected from a great variety of quarters. Mr. Graves contributed the portraits of the Marquess of Lorne and the Princess Louise, by Mr. Holyoake; Mr. Brudenell Carter, a very fine Japanese cloisonnée enamel; Professor Tennant, a selection of fossils, with diamonds from South Africa, and gold from New Zealand; Dr. Rae, a number of curiosities of the Esquimaux and North Pacific Islanders; while the Autotype Company, Messrs. Salviati and Co., the London Stereoscopic Company, Messrs. Murray and Heath (of Jermyn Street), and Messrs. Power and Lealand were each represented by numerous specimens of their respective arts. In the small library, Mr. Anderson Rose's choice collection of engraved portraits deservedly attracted much attention from those of the company who appreciated art in its application to history; and Mr. Seymour Haden's very fine etchings also received special commendation.

In consequence of the pressure upon our space caused by the legal reports, we are compelled this week to withhold the Correspondence and Reports of Societies.

The Pharmaceutical Journal.

SATURDAY, JUNE 17, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACEUTICAL LEGISLATION.

THE official report of the proceedings of the Council* and our Parliamentary report,† will, this week, be found to contain matter of especial interest and importance. At the Council meeting held on the 7th instant, it was resolved, in furtherance of the decision arrived at by the Society at its Annual Meeting, that the regulations for the keeping, dispensing and selling of poisons, which we have already published,‡ should be forwarded to every Pharmaceutical Chemist and Chemist and Druggist on the register, with the urgent request of the Council for their universal adoption. At the same time a letter of inquiry from Mr. SIMON was answered, informing him that this was to be done at once.

But it has since then become apparent that a Bill to amend the Pharmacy Act of 1868 had already been introduced into the House of Lords, by the LORD PRESIDENT OF THE COUNCIL, acting on behalf of the Privy Council. The purport of this Bill, which will be found printed at p. 1015, is to transfer the power of action in the matter of poison regulations from the Society to the Council, and also to give the Privy Council the power of acting under certain conditions. This Bill was ordered to be printed on the 6th instant. On Monday it was read a second time. On Tuesday it passed through Committee. On Thursday it was read a third time, and passed.

Consequent upon this action of the Privy Council, a special meeting of the Council of the Pharmaceutical Society was summoned on Wednesday, resulting in a resolution—That a Committee be appointed to watch the progress in Parliament of the Bill, and prevent the passing of obnoxious clauses.

It now remains to be seen what ground there may be for the opinion which has been pretty freely expressed to the effect that the pharmacists of this country have not as a class either the power or the influence to command representation in Parliament. It is not now necessary to consider the grounds on which this opinion is based, but there is no question as to the present occasion being an opportunity for showing whether there can be any efficient opposition brought to bear, or whether there may not be good reason for the taunt that the agitation against poison regulations is merely "tall talk" about a "sentimental grievance."

In reference to our article last week, in which we expressed a hope that the action taken by the Society would have been deemed sufficient by the Privy Council, at least for the present, we may just mention that one of the obscurer medical journals endeavours to ridicule our remarks on the subject; but while betraying ignorance of the fact that the Council had acted for the Society, and had acted as its representative, it merely exposes the deficiency of its information, and illustrates the maxim, "*ex nihilo nil fit.*"

* See p. 1013. † See p. 1015. ‡ See p. 949.

RECENT EVENTS AND THE "OUTSIDE" ORGAN.

THE *Chemist and Druggist* for June, while naturally devoting to the "pecuniary principle" the first place, furnishes its readers with a somewhat out of date *résumé* of the election for fourteen members of the Pharmaceutical Council, in the shape of a column of propositions, which are generally so far truisms as to be above criticism. In another place our contemporary deals largely in retrospective potentialities concerning those who "stayed away" from the Annual Meeting; but at the same time shrewdly assumes an air of warning as to the possible consequences of staying away on such an occasion. In a spirit of fairness we abstain from any comment on the prophecy as to the action of Parliament in the matter of Poison Regulations, for it is evident the article was written before any knowledge of the Pharmacy Bill of 1871 had been obtained, and the validity of the prediction hazarded yet remains uncertain.

But the most interesting portion of the *Chemist and Druggist* this month is the Supplement containing an account of the Pharmacy Bill now in the House of Lords, and there the *Chemist and Druggist*, so far does justice to the remarks we have elsewhere made, as to express belief in the passage of the Bill through Parliament, and in the need for active measures if it is to be opposed successfully. We quite agree with this view, and feel equally sure that as the matter now stands, something will be needed much more efficient than editorial buttering of Mr. GLADSTONE.

MULTIPLE VISION.

IN the columns of a scientific contemporary there recently appeared a discussion as to how many different objects it is possible to include in an instantaneous glance of the eye. The performance of any considerable number of experiments to decide this question would possibly result in a certain amount of bewilderment and inability for the time to discriminate between a larger and a smaller quantity.

We would charitably suggest some such condition to account for the propensity shown by the *Lancet*, when referring to some topics, to reverse the generally received axiom that the lesser is included in the greater. We would only just allude to the fact that whenever it refers to the poison question it speaks as if the number of deaths proved to have occurred through the carelessness of pharmacists was a very large one; this might be a matter of opinion depending upon what constitutes a large number.

But some of our contemporary's statements are not open to this explanation. A short time ago it gravely announced in leader type, in reference to infant mortality in France, that "out of every thousand children under a year old, 288, according to Dr. BERTHILLON, perish in the Marne, 295 in the Oise, 307 in Seine-et-Marne, 313 in Yonne, 318 in Seine Inférieure, 319 in Eure, and in the department Eure-et-Loire (dedicated 'aux petits Parisiens'), 370!" And then it naïvely asks, "Is not this an appalling return?" Well, we rather think it is.

As a fitting corollary we add another extract from the *Lancet* last week. "A chemist and druggist at Welshpool, because of some alleged misstatement on his part, had his name removed this year from the Society's Register, with the result of his being repeatedly sued in the Welshpool County Court for penalties as an unregistered vendor of drugs." Now as the "chemist and druggist" with whom the *Lancet* seems to sympathize has only been sued once by the Pharmaceutical Society, and the result of that case was hardly known in London at the time when it is presumed our contemporary went to press, we are compelled to fall back upon some such theory as we have suggested, unless indeed the *Lancet* intends to try its hand with the sporting papers in the prophetic line. But then, will not the fact that the Court of Queen's Bench has since decided that the person in question is not a "chemist and druggist" at all, have some slight effect upon the vaticination?

Mr. BENTHAM, in his recent Presidential Address at the Anniversary Meeting of the Linnean Society, said that the mismatching of specimens had been in botany a fertile cause of the production of false genera and species. The most careful collectors have in good faith transmitted flowers and fruits belonging to different plants as those of one species: the fruits perhaps picked up under a tree from which they were believed to have fallen, or under two trees in the same forest with similar leaves, one in flower, the other in fruit, are supposed to be identical, but in fact not even congeners. Mismatching in the subsequent stages of drying, sorting and distributing of specimens is also very frequent. Another cause is that collectors instead of noting down any memoranda at the time, and attaching them immediately to the specimens, or identifying them by numbers, too often trust to their memory when finally packing up their specimens. So long as a hasty glance at a specimen and the memoranda attached to it is substituted for reasoning by analogy, these errors are not discovered. Till recently the genus *Magallana*, of CAVANILLES, was allowed seriously to invalidate the character of Tropæoleæ, the strong internal evidence that it was founded upon the fruit of one Natural Order carefully attached to a poor flowering specimen of another, being overlooked.

MUCH has been done of late years in introducing medicinal plants of other climes into Indian soil for cultivation for commercial purposes. The cinchonas have been a grand success, and other experiments, we hope, will be equally successful. Though we are naturally more interested in plants connected with our own branch of science, we can nevertheless rejoice at the success of other useful plants; and though the following extract of a letter of a correspondent in Southern India bears more immediately upon agriculture, it is, we think, a good indication of what we may expect of India at no very distant date. Our correspondent says,—"Agricultural topics have of late received much more attention out here than they ever did before. Arrangements are pending at Calcutta for a new department of agriculture and commerce for India. Model farms are also being established in different parts of the country, to show the native farmers the advantages of the European system. The authorities are at last beginning to perceive that the native style of cultivation is, after all, faulty, and are getting alarmed about the land revenue, crops not being so good as they used to be. Fuel is getting scarcer every year, and the manure is taken as a substitute, thereby impoverishing the soil, while artificial manures are still unknown to the natives generally."

THE first of a series of articles, by Dr. B. W. RICHARDSON, F.R.S., entitled "Some Further Additions to Therapeutics," appears in the current number of the *Practitioner*. In this paper the author treats of the organic bromides, viz. bromide of quinine, bromide of morphine, and bromide of strychnine, their combinations and administration, and hydrobromic ether and bromide of methyl. The substance of the article has already appeared in the Journal, *ante*, p. 854.

WE are this week indebted to a correspondent for a copy of the *Beverley Guardian*, containing a full account of a recent case of poisoning by arsenic at Beverley; we take the opportunity of communicating to our readers that we shall always be glad to receive from them any similar information on matters of interest to pharmaceutists.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

June 7th, 1871.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Edwards, Greenish, Groves, Haselden, Hills, Sandford, Savage, Shaw, Smith, Stoddart, Sutton, Williams and Woolley.

Mr. A. F. Haselden was called to the chair, and took the same accordingly.

The minutes of Council on the 3rd and 17th ult. were read and confirmed.

This being the first meeting of the Council after the Anniversary, the election of Officers for the ensuing year was proceeded with by ballot.

Mr. A. F. Haselden was unanimously elected President.

Ballot was then taken for the election of Vice-President with the following result:—

Edwards	9
Williams	7

Mr. Edwards was then declared Vice-President.

Mr. Hills was unanimously elected Treasurer.

Elias Bremridge was reappointed Secretary and Registrar.

Richard Bremridge was reappointed Assistant-Secretary and Deputy-Registrar.

Moved by Mr. Brown, seconded by Mr. Carr,

Resolved—That the following be the Standing Orders of the Council for the ensuing year:—

1.—That at all meetings of the Council the chair shall be taken at eleven o'clock in the forenoon, and business immediately proceeded with, provided a quorum be present.

2.—That all notices of motion shall be given in writing to the Secretary, and shall distinctly state the nature or substance of the resolution intended to be submitted to the Council; and all such notices shall be dated and numbered as received, and entered in a book to be kept for that purpose at the Secretary's office, which book shall be open to the inspection of every member of the Council.

3.—That motions for which such notice shall be given shall have precedence over other motions, and be entered by the Secretary upon the notice paper in the order in which they are received,—routine business and other matters brought specially before the Council by the President only excepted.

4.—That the Secretary shall insert in the summonses for any meeting of the Council, in addition to such matters as may be ordered by the President, all subjects for which notice of motion shall have been given before five o'clock in the afternoon of the day preceding the day for summoning the Council.

5.—That at every meeting of the Council all motions, whether original motions or amendments, shall be reduced into writing, signed by the mover, and delivered to the Secretary immediately upon being seconded.

6.—That whenever amendments are made upon original motions, no second amendment shall be taken into consideration until the first amendment be disposed of.

7.—That if a first amendment be carried, it displaces the original question, and becomes itself the question, whereupon any further amendment may be moved.

8.—That if the first amendment be negatived, then a second may be moved to the original question under consideration; but only one amendment shall be submitted to the Council for discussion at one time.

9.—That the mover of every original motion, but not of any amendment, shall have a right to reply, immediately after which the question shall be put from the chair; but that no other member be allowed to speak more than once on the same question, unless permission be given to explain, or the attention of the chair be called to a point of order.

Resolved—That the best thanks of this Council are due, and are hereby tendered, to their Lordships the Committee of Council on Education for the use of the South Kensington Museum on the 17th May for the purpose of holding the Society's Conversazione.

Resolved—That the Secretary be requested to convey to the official staff of the South Kensington Museum the best thanks of this Council for the prompt and energetic manner in which the arrangements for the Society's Conversazione on the 17th May were carried out.

The following Committees were appointed:—

General Purposes—The whole of the Council; to meet on the day preceding the meeting of Council, at 7.30 P.M.

Finance—Messrs. Betty, Carr, Greenish, Sutton and Woolley; at 11 A.M. on the day preceding the meeting of Council.

Library, Museum and Laboratory—Messrs. Brown, Greenish, Hills, Sandford, Stoddart and Williams; at 11 A.M. on the second Wednesday of each month.

House—Messrs. Brown, Greenish, Hills, Sandford, Stoddart and Williams.

Benevolent Fund—Messrs. Betty, Carr, Greenish, Sutton and Woolley.

Parliamentary—Messrs. Atherton, Bottle, Brown, Hills, Sandford, Savage, Shaw and Williams, with power to add to their number.

Publication of Council Minutes—The President, Vice-President and Mr. Sandford; the first Tuesday after the meeting of Council.

Provincial Education—Messrs. Atherton, Betty, Carr, Greenish, Groves, Mackay, Reynolds, Sandford, Shaw, Stoddart, Sutton, Williams and Woolley; to meet, when required, on the day preceding the meeting of Council, at 4 P.M.

On the motion of Mr. Hills, seconded by Mr. Savage, the following twelve Pharmaceutical Chemists were elected and appointed Examiners for England and Wales for the ensuing year, subject to the approval of the Privy Council:—

Allchin, Alfred	London.
Barnes, James Benjamin	London.
Bird, Augustus	London.
Carteighe, Michael	London.
Cracknell, Charles	London.
Davenport, John T.	London.
Gale, Samuel	London.
Garle, John	Bickley, Kent.
Hanbury, Daniel	London.
Ince, Joseph	London.
Linford, John Samuel	London.
Southall, William	Birmingham.

The following seven Pharmaceutical Chemists were appointed Examiners for Scotland for the ensuing year, subject to the approval of the Privy Council:—

Ainslie, William	Edinburgh.
Aitken, William	Edinburgh.
Brown, David Rennie	Edinburgh.
Buchanan, James	Edinburgh.
Gilmour, William	Edinburgh.
Kemp, David	Portobello.
Young, James R.	Edinburgh.

The President and Vice-President are on all Committees *ex officio*, and on the respective Boards of Examiners in London and Edinburgh.

LOCAL SECRETARIES.

The Council elected Local Secretaries for the ensuing year (a list of whom was published in last week's Journal).

The Report of (Messrs. Carr, Haselden and Williams, who acted as) the Finance Committee in auditing the accounts for the past month was presented, showing on the General Fund account a balance in the Treasurer's hands of £2983. 14*s.* 2*d.*, and submitting for payment accounts amounting to £773. 9*s.* 11*d.*; and on the Benevolent Fund account a balance of £569. 10*s.* 1*d.*

Resolved—That the Report be received and adopted, and payments made.

Resolved—That the Treasurer be requested to purchase Stock on the following accounts:—

General Fund . .	New Three per cents.	£1000
Life Members' Fund	do.	£110
Benevolent Fund .	Consols	£500

Resolved—That the Report of the Library, Museum and Laboratory Committee be received, and that the question of warming the Laboratory be referred back to the Committee.

Resolved—That it is expedient to elect two Annuitants on the Benevolent Fund in October next, and that the Secretary be requested to announce in the usual channels that such election will take place.

REPORT OF THE BOARD OF EXAMINERS.

England and Wales.

1871.	Examination.	Candidates examined.	Candidates passed.	Candidates failed.
May 12....	Modified	47	27	20
,, 23 & 24	Major	6	4	2
,, 24....	Minor	28	20	8
		81	51	30

Preliminary. Two Certificates were received in lieu of this Examination.

Scotland.

1871.	Examination.	Candidates examined.	Candidates passed.	Candidates failed.
May 30....	Minor	4	3	1
,, ,, ...	Modified	4	3	1
,, ,, ...	Preliminary	6	4	2
		14	10	4

The following letter from the Medical Department of the Privy Council was read:—

[Copy.]

"*Medical Department of the Privy Council,*
"*June* 1*st*, 1871.

"Sir,—Adverting to my letter of the 4th ult.,* the Lords of Her Majesty's Council, believing that the Annual Meeting, therein referred to, of the Pharmaceutical Society has now been held, direct me to inquire what steps the Society has taken with regard to the matters to which that letter has reference.

"I am, Sir,
"Your obedient servant,
"John Simon.

"*The Secretary to the*
"*Pharmaceutical Society,*
"*Bloomsbury Square,* w.c."

Moved by Mr. Brown, seconded by Mr. Woolley,—
Resolved—That the following letter be adopted by this Council, and the Secretary be instructed to forward the same to the Medical Department of the Privy Council:—

* See Pharm. Journ. May 27th, 1871, p. 942.

[Copy.]

"*Pharmaceutical Society of Great Britain,*
"17, *Bloomsbury Square, W.C.,*
"*June 7th*, 1871.

"Sir,—In reference to your letter of May 4th, drawing attention on behalf of the Lords of Her Majesty's Council to the approaching Annual Meeting of the Pharmaceutical Society, trusting that regulations would then be made in regard to the keeping, dispensing and selling of poisons (as will be sufficient to secure the safety of the public), and of June 1st, inquiring what steps the Society had taken with regard to the matters referred to in the previous letter, I am instructed by the Council of the Pharmaceutical Society this day assembled (being the first meeting after the Annual Meeting), to inform you that at the meeting of the Council of the Pharmaceutical Society, held on the 5th April, it was resolved that Regulations for the keeping, selling and dispensing of poisons should be issued as Recommendations.

"In this form they were submitted to and adopted by the Annual Meeting of the Pharmaceutical Society, held on the 17th May last, and copies will at once be distributed by the Council to Pharmaceutical Chemists and registered Chemists and Druggists throughout the country. The Council beg to submit to the Lords of her Majesty's Privy Council a copy of the Recommendations and the resolution of the Annual Meeting thereon.

"I have the honour to be, Sir,
"Your obedient servant,
"Elias Bremridge,
"*Secretary and Registrar.*

"John Simon, Esq."

Resolved—That a printed copy of the recommendations for the keeping, dispensing and selling of poisons,* passed at the Annual Meeting, be forwarded to every Pharmaceutical Chemist and Chemist and Druggist on the Register, with the urgent request of this Council for their universal adoption.

A memorial which had been handed in by Mr. Vizer from chemists and druggists, not being Members of the Society, deprecating the enactment of compulsory regulations as to the storing and dispensing of poisons, was presented to the Council.

Moved by Mr. Atherton, seconded by Mr. Brown,—
Resolved—That the various applications for assistance which had been received from Provincial Societies be referred to the Provincial Education Committee for their consideration.

Resolved—That Dr. J. L. Soubeiran, of Paris, be elected an Honorary and Corresponding Member of this Society.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be severally granted a Certificate stamped with the seal of the Society:—

Bannard, Henry	London.
Catterns, Heneage Parker	London.
Deane, James	Clapham.
Fowler, William Ratcliffe	Ipswich.
Freeman, Ernest	Stourbridge.
Linton, Ralph Tait	Edinburgh.
Sambrook, William	Cardigan.
Troake, Marler Hamilton	Kingsbridge.

Resolved—That the following Pharmaceutical Chemists be, and are hereby elected Members of the Society:—

Agnew, Ernest James Tween	London.
Clarke, Josiah	Croydon.
Deane, James	Clapham.
Fowler, William Ratcliffe	East Kirkby.

* See Pharm. Journ. May 27th, 1871, p. 949.

Fryer, Charles ....London.
Horsley, Thomas Wood ......London.
Procter, Samuel James ......London.
Scott, Walter ....Elgin.
Sherburn, Thomas ....Howden.
Watts, John ....London.
Williams, George Henry......London.

Resolved—That the following registered Chemists and Druggists be elected Members of the Society:—

Bainbridge, Robert Robinson..Stockton-on-Tees.
Bellamy, John ....Birmingham.
Dudgeon, Charles ....Bristol.
Dutton, Francis ....Bolton.
Holmes, Joseph ....Leeds.
Hunt, Samuel ....Sudbury.
Jones, Alfred Maddox.........Brynmawr.
Kaye, Hamor ....Huddersfield.
Linnett, Samuel Soden ....59, Southgate Road.
Scott, David Wolsey ....Barmouth.
Short, Edward Henry ....Acton.
Walker, Joseph ....Tewkesbury.
Wells, Thomas ....91, Charlwood St.

Resolved—That the following having passed their respective examinations be elected Associates in business:—

MINOR.

Edey, George ....Christchurch.
Gittings, Alfred ....Oldbury.
Glazier, Walter Henry ....London.
Grindell, John ....Hull.
Hay, Thomas Alexander .....Wavertree.
Hodgkinson, George A........London.
Richardson, Richard Thomas..Liverpool.
Riggall, Francis Henry ....Louth.
Sumner, Benjamin Tindale ..Grantham.
Waterworth, Alfred ....Preston.

MODIFIED.

Burn, Thomas ....Sunderland.
Fudgé, Charles William .....Shepton Mallet.

Resolved—That the following having passed their respective examinations be elected Associates:—

MINOR.

Ballard, Frank Perry.........Ludlow.
Barclay, John ....London.
Barnes, Francis Joshua ....Preston.
Black, James ....Markinch.
Carr, George ....Sheffield.
Cooper, Anthony Vincett .....Birmingham.
Davies, Robert Higgins.......Dartford.
Ellwood, Francis Henry .....Norwich.
Forsbrook, William Henry ..Birmingham.
Hill, Walter...................Cheltenham.
Kemp, John ....Inverness.
Maddison, Henry Gildon .....London.
Parker, William ....London.
Saunders, Charles Price......Haverfordwest.
Selley, John...................Aylesbury.
Shenstone, William Ashwell..Colchester.
Smyth, Arthur William.......Diss.
Stansby, Charles John ....Derby.
Tonks, Joseph ....Wolverhampton.
Wilkes, John Sanders ....Stafford.
Woolley, Harold..............Manchester.

MODIFIED.

Archer, James ....Lechlade.
Bowen, Joseph William.......Holyhead.
Burton, Joseph ....Sheffield.
Coates, Henry ....York.
Ramsden, William ....Fallowfield.
Richardson, Thomas James ..Carlisle.
Spratt, George Uriah ....Boston.
Woodcock, Arthur ....London.

The Secretary presented a list of Members and "Associates in Business," who had paid their subscriptions since the 30th April last, and it was

Resolved—That they be severally restored to their former status on payment respectively of a nominal fine of 1*s*.

SPECIAL MEETING OF COUNCIL, *June 14th*,

To consider the provisions of the Bill now before the House of Lords, intituled "An Act to Amend the Pharmacy Act, 1868."

MR. A. F. HASELDEN, PRESIDENT, IN THE CHAIR.
MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Greenish, Groves, Hills, Sandford, Savage, Shaw, Smith, Williams and Woolley.

Moved by Mr. Brown, seconded by Mr. Greenish,

That the passing of the Biil as now worded, intituled an "An Act to Amend the Pharmacy Act, 1868," be opposed by the Council.

Amendment—Moved by Mr. Groves, seconded by Mr. Smith,

That a committee of this Council be appointed to watch the progress in Parliament of the Bill "to Amend the Pharmacy Act, 1868," and prevent the passing of obnoxious clauses.

For the Amendment—
Messrs. Carr, Edwards, Groves, Haselden, Hills, Sandford, Smith and Williams.

Against—
Messrs. Atherton, Betty, Bottle, Brown, Greenish, Savage, Shaw and Woolley.

The numbers being equal, the Chairman gave the casting vote in favour of the Amendment.

The Amendment was then put as a substantive motion and carried.

Moved by Mr. Groves, seconded by Mr. Smith, and

Resolved—That the Parliamentary Committee be instructed to watch the Bill referred to in the last Resolution, and that Mr. Betty be added to that Committee.

Moved by Mr. Woolley, seconded by Mr. Brown, and

Resolved—That the proceedings of this day's Council be inserted in the current week's Journal.

At the termination of the Council meeting the Parliamentary Committee met and determined on sending a deputation to the medical officer of the Privy Council on the following day (Thursday) for the purpose of introducing certain amendments into the Bill.

Parliamentary and Law Proceedings.

A BILL INTITULED AN ACT TO AMEND THE PHARMACY ACT, 1868.

Whereas under the Pharmacy Act, 1868, persons selling or keeping open shop for retailing, dispensing or compounding poisons are required to conform to such regulations as to the keeping, dispensing and selling of poisons as may from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council:

And whereas the Pharmaceutical Society have failed to submit for the consent of the Privy Council any regulations for the above purposes, and it is expedient to make further provision for the making of such regulations:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in the present Parliament assembled, and by the authority of the same, as follows:

1. This Act shall be construed as one with the Phar-

macy Act, 1868 (in this Act referred to as the principal Act), and with the Act of the session of the thirty-second and thirty-third years of the reign of her present Majesty, chapter one hundred and seventeen, intituled "An Act to amend the Pharmacy Act, 1868," and those Acts and this Act may be cited together as the Pharmacy Acts, 1868 to 1871, and each of the above-mentioned Acts and this Act may be cited as the Pharmacy Act of the year in which it was passed.

2. The recited powers of the Pharmaceutical Society of Great Britain under the principal Act shall cease, and the Council of the said Society may from time to time submit to the Privy Council regulations as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, and as to revoking or amending any such regulations previously made, and the Privy Council may, if they think fit, by order approve of such regulations.

If at any time it appear to the Privy Council that there are no regulations for the time being in force under the principal Act as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, the Privy Council may serve a notice on the Council of the Pharmaceutical Society requiring them to frame and submit for the approval of the Privy Council regulations as to the matters aforesaid, and if the Council of the Pharmaceutical Society, within the time limited by such notice, not being less than two months from the date of the service of the notice, make default in framing such regulations, or obtaining the approval of the Privy Council thereto, the Privy Council may themselves frame regulations as to the matters aforesaid.

All regulations approved or framed by the Privy Council in pursuance of this section shall have the same effect as regulations prescribed in manner specified in the principal Act.

HOUSE OF LORDS.

PHARMACY BILL, *June* 6.—The Pharmacy Bill was introduced by the Lord President of the Council. It was read a first time and ordered to be printed. The second reading was appointed for June 12.

June 12.—The Pharmacy Bill was read a second time. Committee fixed for June 13.

June 13.—The Pharmacy Bill passed through Committee. To be read a third time on Thursday, June 15.

June 15.—The Pharmacy Bill was read a third time and passed.

HOUSE OF COMMONS.

MEDICAL ACT (1858) AMENDMENT BILL.—*June* 14.—The second reading of this Bill was moved by Dr. Lush. He said it was brought forward in consequence of Mr. Foster's Bill of last session having failed to satisfy the profession, and the Government being too busy this session to deal with the question. It proposed to substitute the present Council of twenty-four members by one of twelve, four members to be nominated by the nineteen examining bodies at present in existence, four by the Crown, and four by the whole body of the profession. It provided also that before a man was allowed to practise he should be compelled to pass one examination, which examination should indicate the minimum standard of professional education in this country.

Mr. Jessel said this Bill would give a monopoly of examination into the hands of the Medical Council, by giving it a right to appoint the Board of Examiners, in which it differed from the Government Bill of last year. It also defined what the examiners were to do, without having regard to the natural progress of science and learning. Under the present system there had been a race to diminish the qualification required, in order to attract a large number of fee-paying persons to the examinations. The examiners must be made honest by preventing them from having a pecuniary interest in the result of the examinations. It would not be right to have the Examination Board and the Controlling Board composed of the same persons.

Dr. Brewer supported the Bill.

Dr. Playfair said that whereas the present Bill extinguished the old corporation, which he thought was a mistake, another Bill that was before the House recognized, and left them nearly alone. It was a disadvantage to have nineteen examining bodies having a tendency to compete with each other, thus securing only a minimum qualification; but it did not follow that they should be reduced to one. It would be better that there should be an examining body for England, another for Scotland, and another for Ireland. He hoped both Bills would be withdrawn, and that the Government would deal with the question next Session.

Mr. W. Forster said that the Government were aware of the great practical evils that resulted from there being nineteen accredited bodies for certifying medical practitioners, but they had been unable to deal with the question this year. So many subjects pressed for legislation, that he could not pledge the Government to bring in a Bill next session, but if they did not, and a private member took up the subject, no opposition would be offered to the fullest consideration of the subject.

After a few words from Dr. Brady, who stated that his own Bill, the "Medical Act (1858) Amendment (No. 2) Bill," had been carefully prepared, and gave satisfaction to the profession, both Bills were withdrawn.

WELSHPOOL COUNTY COURT, *Thursday, June 8th*, 1871.

(*Before* J. W. SMITH, Esq., *Judge.*)

Pharmaceutical Society of Great Britain *v.* E. C. Whisken, of Welshpool.

This was an action brought to recover £5, upon particulars as follows:—"To amount of penalty incurred by the defendant in selling or keeping open shop for retailing, dispensing or compounding poisons or a poison, and in taking, using or exhibiting the name or title of chemist and druggist, contrary to the provisions of the Pharmacy Act, 1868 (31 & 32 Vict. cap. 121)."

Mr. Flux (of London) appeared for the Pharmaceutical Society; Mr. Chandler (of Shrewsbury) appeared for the defendant.

Mr. Chandler.—Your Honour will allow me to apply that this case shall stand over to a future day. I can only assure you that the case came before the Court of Queen's Bench this week, and that a rule was granted *nisi* for a *mandamus*. The case will be tried in all its details on Saturday, and the very fact of this plaint being issued is mentioned in the application to the Judges. I am not prepared to go on with the case to-day; my documents are in London, and I do not think it is fair to yourself or to the defendant that the case should be proceeded with. I am prepared to pay the amount of the penalty sued for into Court, but I do not think it fair that the case should be heard here to-day.

Mr. Chandler then handed to the Judge the *Times* of Tuesday, June 6th.

Mr. Flux.—I have no objection to your Honour looking at the *Times*. I have no doubt that it contains a correct report of what took place in the Court of Queen's Bench, but the application to that Court was an *ex parte* one. Of course the application of my friend is opposed by me. That this application would be made was intimated to me, and my reply, which I will hand to your Honour, is dated the 27th May. The case of the Society which I have the honour to represent is this:—They are charged in the public interests to protect the public in the matter of the selling of poisons, and, having satisfied themselves that the defendant is not a qualified person, and is deliberately violating the law, they have thought it a duty to commence this action (which by the law must be tried in the locality where the defendant resides and is known) for the protection of the public; and, representing the Society, I cannot take the responsibility of consenting to, or even of failing to the utmost of my ability to oppose, any delay in this matter, because so long as this case is undecided the defendant is holding himself out to the world as possessing a statutory qualification to sell poisons; and if by any accident any subject of her Majesty were to be seriously prejudiced through the sale of poisons by the defendant, I being charged with these proceedings, could not feel that I was free from blame in the matter. As to the case in the Court of Queen's Bench being disposed of on Saturday or Monday, seeing that the term ends on Monday, I can hardly hope that, in the existing state of business, the rule can be argued before November. So far as I am aware, there will not be any sittings after term at which a rule of this kind can be argued, and I have no hope of getting the matter disposed of before Michaelmas Term unless it be accomplished on Monday. If it be not disposed of on Monday, the defendant will have an excuse for continuing to sell poisons to her Majesty's subjects between this date and November.

The Judge.—Is it limited to the case of selling poisons?

Mr. Flux.—Certainly; he can sell anything else, but he cannot call himself chemist and druggist, and he cannot sell certain poisons if he be not a duly qualified person. The issue as to whether he is a duly qualified person or not is one which I can approach with the utmost confidence. I put it to your Honour that I may proceed with it at once. This question will hardly be disposed of by the Court of Queen's Bench, because if the defendant be restored to the register he will none the less have been in open violation to the law during the period covered by this plaint. He knows that he is not on the register, and my case is plain that he is violating the law at this moment. Whether he can obtain the restoration of his name to the register is a matter which the Court of Queen's Bench may deal with; but that he will get his name restored I, as the adviser of the Society, cannot for a moment imagine. Your Honour will see that the gist of the defendant's case in the Court of Queen's Bench is, that before a given day in 1868 he carried on the business of a chemist and druggist in open shop, in New Street, in this town. The place is within a few minutes' walk of this, and although it is perhaps too much for me to suggest that your Honour should see the place yourself, I may venture to say that if some one deputed by your Honour were to go, he would be shocked at the appearance of the place.

The Judge.—Was there no open shop?

Mr. Flux.—No, your Honour.

Mr. Chandler.—These are facts which have to be decided on solemn affidavits in London. The defendant's witnesses are not here now, and will not be here. The question which is now being tried is a sort of preliminary one, and may be used by us on Monday. Whisken was certainly at one time on the register, and during that time no harm occurred to any one; and to ask your Honour to put a stop to a business—

The Judge.—Is he the farrier?

Mr. Flux.—Yes, your Honour, and never was anything else.

Mr. Chandler.—I am in no position to fight the case to-day. My agents gave the other side notice of my intention to apply for this postponement, and it has not been consented to.

Mr. Flux.—My reply was, that if the defendant would cease to use the title "chemist and druggist," and would otherwise cease to violate the law during the interval, we would consent.

The Judge (to Mr. Chandler).—One would have thought that you would have been willing to have foregone the selling of poisons.

Mr. Chandler.—We have not violated the law, and why should a large society ride rough-shod over us? Acting under the advice of counsel, I would not give such an undertaking. Besides, there is in the defendant's shop a member of the Pharmaceutical Society acting as his assistant; and no danger can therefore arise, and, even if it did, the Pharmaceutical Society would not be liable for it. Therefore, that argument is, I think, a somewhat far-fetched one. The case is before your Honour, but I repeat that I am not prepared to proceed with it now.

Mr. Flux.—I know nothing about there being any member of the Society in the defendant's employ.

The Judge.—I will turn the matter over in my mind.

Mr. Flux.—Respecting my friend's statement as to this gentleman's name having been on the register, I should like your Honour to note that it was placed on the register on the strength of a certificate granted by a gentleman who is at present High Sheriff of the county; and that, upon a letter being addressed to that gentleman by the Registrar of the Society (a most courteous letter, as your Honour will see), directing his attention to that which he had signed, as well as to the words of the statute,—that gentleman wrote a most courteous reply, expressing his prior ignorance of the words of the statute, and withdrawing his certificate; and thereupon the Council of the Society erased the defendant's name from the register.

Mr. Chandler.—Although they had received further certificates.

Mr. Flux.—No, they had not.

The Judge.—What I have to do is to make up my mind whether I shall direct this case to be adjourned or not, and I will consider the matter.

At a later period of the day, the Judge, addressing the defendant's attorney, said: The facts are admitted which render the defendant liable to the penalty, and you seek an adjournment only in consequence of the proceedings in town?

Mr. Chandler.—Yes, because we say that he ought to be on the register.

The Judge.—I do not conceive that I have any power to abrogate any section of the Act of Parliament, or to add any words to it. Even admitting that it had been already decided that the Pharmaceutical Society were wrong in excluding the name of the defendant from the register, he would still, according to the Act of Parliament, be liable to this penalty, and I should have no power, so far as I can at present see, to relieve him from it. I sit here to administer the law as I find it.

Mr. Chandler.—Supposing that the Court of Queen's Bench decides that the defendant is entitled to have his name upon the register, we shall obtain a judge's order directing the Society to reinstate the name.

The Judge.—That would not relieve him from the penalty; he was not on the register at the time when the act complained of was committed.

Mr. Chandler.—Very true; but if the judges order his name to be replaced, the Society will be obliged to comply with the order, and then they would not be able to sue him for a penalty.

The Judge.—Still he would not have been on the register during the past time, in respect of which this action is brought.

Mr. Chandler.—Your Honour will see that the judges might find that it was wrong to remove his name.

The Judge.—I do not know that they would have the power to do so. They might grant a rule against me in enforcing the penalty against him under those circumstances; that, however, is not the case before me. According to the Act of Parliament he is within the penal clause, and I do not think that I have any power to relieve him; but what I can do is this, to say to the representative of the Society; if it be decided against you in the Court of Queen's Bench, I would suggest that you should undertake not to enforce the penalty.

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* We are informed by the Registrar that the assistant is not a member of the Pharmaceutical Society, nor is he on the Register of Chemists and Druggists.—ED. PHARM. JOURN.

Mr. Flux.—Your Honour may be sure that I will not enforce this penalty until the decision of the Court of Queen's Bench upon the rule is obtained, and that if the decision be in favour of this defendant I will not seek to enforce the penalty at all; but I wish the defendant to understand this, that by continuing the business so long as his name is not on the register, he is holding himself out to the public in a capacity which I cannot recognize, and which I am bound, by all means, to discourage; and that if he continues the offence, I shall deem it a duty to renew my applications for a penalty.

Mr. Chandler.—But not until after a decision.

Mr. Flux.—I shall indeed.

The Judge.—I quite expected Mr. Flux to say that; but he will not enforce them.

Mr. Flux.—No.

The Judge.—Until the contrary be proved, it must be assumed that the decision of the Council as to the erasure of the defendant's name from the register was a just one; otherwise, we should be continually having these defences raised, and we might, during an indefinite period of time, have these persons carrying on their trade, and endangering the lives of her Majesty's subjects, whilst it was being tried in a Superior Court whether they ought to have been on the register or not. I think it would be an unfortunate state of things if that were so. At any rate, I sit here to administer the law as I find it, and not to relieve from the effects of the law by importing provisions which I do not find in the Act of Parliament itself. I think it would be an idle waste of the public time to do more than submit that if the decision in the Court of Queen's Bench be adverse to the Society the penalty shall not be enforced. As to any future penalties which might be sued for, "sufficient unto the day is the evil thereof."

Mr. Chandler.—My friend has put it fairly enough, but I believe that this case will be tried on Saturday; my friend, however, thinks differently, and I quite bow to his superior judgment. All that I say is, that if we do our best to try this on Saturday we lose no time, and it would be unjust to make a man liable from day to day.

The Judge.—I think they will have vindicated the public interests by these proceedings, and that they will not feel obliged themselves to sue for any further penalty, as Mr. Chandler says his real intention is to pursue this in the Superior Court with the utmost possible diligence, and I should think the sooner he can get the question decided, the better pleased he will be.

Mr. Flux.—Everything is being done on my part to facilitate the hearing of the case in the Queen's Bench before the end of the term; and I venture to say that there can be no doubt as to the great weight which will attach to your Honour's remarks with my clients; and I shall feel it a duty to communicate them, and act upon them, so far as possible, although I do not feel at liberty to give an undertaking on their part not to sue.

The Judge.—You can represent my views to them.

Mr. Chandler.—This has been going on for some time, and the proceedings should have been taken long ago.

Mr. Flux.—That remark recoils upon my friend; he should have applied for his mandamus before.

The Judge.—It certainly strikes me as remarkable, that Mr. Chandler's client should have waited so long as he has and should not have taken proceedings at once.

Mr. Chandler.—His waiting caused him no injury, and he thought he might be affording amusement to the Society.

Mr. Flux then tendered formal evidence.

Mr. Chandler.—I admit that my client's name was not on the register, that he used the title chemist and druggist, and that the action is duly brought in point of form.

The Judge.—I give judgment for the plaintiff with costs.

Mr. Flux then applied for the cost of the Registrar's attendance as a witness.

The Judge.—I do not see that there was any necessity for the Registrar's personal attendance.

COURT OF QUEEN'S BENCH, WESTMINSTER.

TRINITY TERM.

Monday, June 12th, 1871.

Present—LORD CHIEF JUSTICE COCKBURN, MR. JUSTICE LUSH, and MR. JUSTICE HANNEN.

The Queen *v.* the Council of the Pharmaceutical Society of Great Britain.

Mr. Quain (Mr. Bullock with him).—My Lords, in the case of the Queen against the Council of the Pharmaceutical Society of Great Britain, I have to show your Lordships cause against a rule which has been obtained by my learned friend Mr. Bullen upon the 5th of this month, calling upon that Society to show cause "why a writ of mandamus should not issue directed to them commanding them to direct the Registrar of the said Society to restore the name of the said Edward Charles Whisken to the Register of Chemists and Druggists." The question is, whether this gentleman is entitled to be restored to that register? My Lords, the Act of Parliament under which this question arises is the 31st and 32nd Victoria, chapter 121, and that is "An Act to regulate the Sale of Poisons, and Alter and Amend the Pharmacy Act, 1852." Now this Act of Parliament provides for persons entitled to be registered; and I believe I may state shortly the fact, that nobody is entitled to call himself a "chemist and druggist," or to sell poisons (I believe he may sell anything else), unless he brings himself within the authority of this Act. Those are the only two things which the Legislature have interfered with. In order to do that, the statute defines what persons shall be entitled to be registered, and the only question we have to discuss is this, whether the applicant for the writ of mandamus in this case was a chemist and druggist carrying on that business in an open shop dispensing prescriptions of duly qualified medical practitioners before July, 1868, it being in July, 1868, that this Act came into operation; because it entitled all persons who were actually in business before that date to be registered, as a matter of course, after delivering to the Registrar their certificates. Now, the third section says, and this is the section upon which it turns, "chemists and druggists within the meaning of this Act shall consist of all persons who at any time before the passing of this Act, have carried on in Great Britain the business of a chemist and druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners." It turns out to be entirely a question of fact, upon one part of the case, which is as to whether Mr. Whisken, who makes this application, can bring himself within that definition, and can show that he was a chemist and druggist carrying on business in an open shop, dispensing prescriptions of duly qualified medical practitioners, before the date of July, 1868? Now, my Lords, I will tell you what the facts are as disclosed upon the affidavits.

Mr. Bullen.—My Lords, if my friend is going into the facts, I must ask that the case may be postponed, in order that we may answer the affidavits that have been filed, as the affidavits, of which there are no less than twenty-six sheets, have only been delivered to me late on Saturday night last.

Mr. Quain.—It was only moved on the 5th of June.

Mr. Bullen.—But the affidavits consist of all sorts of imputations upon my client.

Mr. Quain.—I apprehend, my Lords, the question is this: we say—and that, in fact, explains the whole case—that we were induced to place upon the register the name of this applicant in consequence of incorrect information furnished to us. That so far from being a chemist and druggist (at least, that is what we say) within the meaning of the provision that I have just read to your Lordship, this person was nothing else but a cow or cattle doctor—a farrier, in fact—at Welshpool; that he was not a chemist and druggist in the ordinary sense of the word, and did not make up prescriptions, except so far as they were for cattle and horses, and that he was not a person who came within the status which he ought to have occupied at the time he made the application. This is the question of fact, so far as that is concerned. I have a large number of affidavits, of course, upon the subject.

The Lord Chief Justice.—It is a difficult inquiry, and this is an unsatisfactory mode of disposing of it, if it depends upon the affidavits.

Mr. Quain.—I was going to say, my Lord, if it were a mere question of fact, no doubt, as there are conflicting affidavits, your Lordships would not go into them.

The Lord Chief Justice.—What I was thinking was that we might refer it to the Master.

Mr. Quain.—I am ready to take any course your Lordship wishes; but, before your Lordship does that, I would wish to draw your attention to this. My learned friend, Mr. Bullock, who is with me, and myself, have looked at the matter in consultation, and, as I have just observed, if it rested entirely upon conflicting affidavits upon matters of fact, I could not expect your Lordships at this moment to go into them and to decide upon them; but I would submit (and I throw this out for the consideration of my friend Mr. Bullen) that this is a matter resting entirely upon points of law, and I would ask your Lordships to decide it upon them without going into the facts, and upon them, I say, this is not a case for a mandamus at all.

The Lord Chief Justice.—We had a similar application to this some time ago.

Mr. Bullen.—That was upon another Act, my Lord.

Mr. Quain.—My friend is quite right; that, was upon another Act. This is the first time your Lordships have been called upon to put a construction upon this Act. The point I am going to take is, that this is a matter of discretion; that is to say, that there is a judicial discretion in the Council of the Pharmaceutical Society, and, that if they have decided it, your Lordships will not interfere. This is not an application upon the ground that they have been asked for a hearing and have declined it, because, here, they have heard and have decided; and I submit that the matter having been so heard and so decided by the Council of the Society under the Statute, it then comes within the ordinary case where the Legislature having vested these functions in the Council of a Society, and they having exercised them, the question cannot be retried upon affidavits. That is the real point. Now, having referred your Lordships to the third section, I will call your Lordship's attention to the fifth: "The persons who at the time of the passing of this Act shall have been duly admitted pharmaceutical chemists, or shall be chemists and druggists within the meaning of the Act, shall be entitled to be registered under the Act without paying any fee for such registration: provided, however, as regards any such chemist and druggist, that his claim to be registered must be by notice in writing, signed by him, and given to the Registrar, with certificates according to the schedules C and D." And, accordingly, the applicant in this case sent up to the Registrar the certificates C and D, within the meaning of that clause; and, having done that, he was thereupon placed on the register, and his name was printed in the Register of the year 1870. Information after that reached the Council of the Society that he was not really what he professed to be, and thereupon an investigation took place. The certificate under schedule C is one that comes from himself, that being one that is sent from the person in business as a chemist; but the certificate under schedule D is to be in these words, and is to be from a medical practitioner or magistrate: "I declare that I am a duly qualified medical practitioner (or magistrate), and that to my knowledge [blank], residing at [blank], in the county of [blank], was in business as a chemist and druggist, in the keeping of an open shop for the compounding of the prescriptions of duly qualified medical practitioners before the [blank] day of [blank]." That he complied with, undoubtedly, in the first instance; but as soon as the information reached the Society that he was not what he professed to be, they communicated with him, and they also wrote to the gentleman, the magistrate, who had signed that certificate. He happened to be a gentleman named Jones, and a most respectable gentleman, no doubt, he being, at the present time, the High Sheriff of Montgomeryshire. The matter having been brought to his attention, he was asked whether he adhered to the declaration he had made according to the terms of the statute, a copy of the Act of Parliament being sent to him, showing that he must state, within his knowledge, that the person was a person who compounded medicines. As soon as that matter was called to Mr. Jones's attention, and he saw the nature of the certificate which he was expected to give, he wrote a letter, in which he withdrew the certificate, saying that he could not allow his name to be attached to a document upon which a shadow of doubt existed. After that withdrawal, I apprehend this gentleman was not entitled to remain on the register.

After that, a certificate of a gentleman named Brock was sent in, but that was after the name had been erased in the way in which I am going to tell your Lordships.

Then comes the 8th section, which refers to the Registrar: "The Registrar appointed, or to be appointed, under or by virtue of the Pharmacy Act, shall be Registrar for the purposes of the Act."

Then the 9th section says:—"The Council of the Pharmaceutical Society shall, with all convenient speed after the passing of this Act, and from time to time as occasion may require, make orders or regulations for regulating the register to be kept under this Act as nearly as conveniently may be in accordance with the form set forth in the schedule (B) to this Act or to the like effect."

Then comes the 10th section, which is with reference to the Registrar:—"It shall be the duty of the Registrar to make and keep a correct register in accordance with the provisions of this Act of all persons who shall be entitled to be registered under this Act, and to erase the names"—your Lordships see he has power to erase the names—"of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act. To enable the Registrar duly to fulfil the duties imposed upon him, it shall be lawful for the Registrar to write a letter to any registered person, addressed to him according to his address on the register, to inquire whether he had ceased to carry on business or has changed his residence," and so on.

Then there is the important section, section 12, of the Act, and the words are these:—"No name shall be entered in the register except of persons authorized by this Act to be registered, nor unless the Registrar be satisfied by the proper evidence that the person claiming is entitled to be registered; and any appeal from the decision of the Registrar may be decided by the Council of the Pharmaceutical Society, and any entry which shall be proved to the satisfaction of such Council to have been fraudulently or incorrectly made may be erased from or amended in the register by order in writing of such Council."

Then there is a penalty put upon the Registrar by section 14:—"Any Registrar who shall wilfully make or cause to be made any falsification in any matter relating to the said registers, and any person who shall wilfully procure, or attempt to procure, himself to be registered under the Pharmacy Act or under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding or assisting him therein, shall be deemed guilty of a misdemeanour." Then there are certain rights reserved under the 16th section. Now, what happened was this: As soon as this magistrate, Mr. Jones, withdrew his certificate, the matter was brought before the Council of the Society, and a correspondence took place.

Mr. Justice Lush.—Was Mr. Jones himself the person who gave the certificate?

Mr. Quain.—Yes.

Mr. Justice Lush.—That he withdrew?

Mr. Quain.—Yes.

Mr. Justice Lush.—At that time there was no proper evidence.

Mr. Quain.—I suppose so. His name had been on.

Mr. Bullen.—It was actually on at that time.

Mr. Quain.—He was on at the time Mr. Jones withdrew his certificate. On receiving the certificates C. and D., and the application, it was put on as a matter of course. Then being on, and being published in the list, he was on the regular register for 1870, and then this information reaches the Council that he has not been properly put on.

Mr. Justice Lush.—Then you say that it was proved to the satisfaction of the Council that his name had been incorrectly put on?

Mr. Quain.—Yes, my Lord.

Mr. Justice Lush.—And therefore they authorized the erasing it?

Mr. Quain.—Yes.

Mr. Bullen.—I should like to have the letter read which was written by Mr. Jones, if my friend comments on this, at the time he withdrew it.

Mr. Quain.—By all means.

Mr. Bullen.—Your Lordships will see he does not go into the merits at all.

Mr. Quain.—Whether he goes into the merits or not, he withdrew his letter. The correspondence is set out on the affidavit. Mr. Whisken most improperly says that Mr. Jones was threatened. There was no threat or anything of the kind to Mr. Jones. The letter is written to Mr. Jones on the 16th July, and he answers it in this way:—"I thank you very much for your courteous communication respecting Mr. Whisken, veterinary surgeon, Welshpool. On the receipt of your letter I sent to Mr. Whisken, requesting his immediate presence to give a satisfactory explanation. My declaration was founded entirely upon his statement of the facts that he had fully and faithfully complied with the requirements of the Pharmacy Act. I had never seen the Act until you kindly favoured me with a copy. I understand the point is whether Mr. Whisken keeps an open shop or not? I have requested Mr. Whisken, with whom I have had an interview to-day, to write to you full particulars in reply to your inquiries, and shall feel obliged if you will oblige me with a line saying that his explanations are satisfactory."

Mr. Justice Lush.—If that is true, his certificate was contrary to the statute.

Mr. Quain.—Yes.

Mr. Justice Lush.—It requires it to be within the knowledge of the party.

Mr. Quain.—By an oversight he overlooked the point; it was accordingly pointed out to him in the next letter.

Mr. Jones is then written to by the Registrar in these words, "Dear Sir,—I am in receipt of yours of the 16th instant, and also of a letter from Mr. Whisken. The chief point is not as you apprehend, whether or not he kept an open shop, although that is important. The question is this: did Mr. Whisken keep an open chemist's shop to your knowledge for the compounding of the prescriptions of duly qualified medical practitioners? His letter is so illiterate that my informant's statement, that 'he could not read a prescription if any one were rash enough to trust him with one,' would seem to be correct."

We have a *facsimile* of one of his letters, if your Lordships would like to see it.

"As to his having a shop, we must, I suppose, accept his own statement, which is, that he 'had a place sit a part as a shop,' but as to the prescriptions, I should be glad to hear from you further. If you do not feel satisfied that Mr. Whisken is entitled to registration, and you made the declaration, on the faith of which his name was placed on the register, without having at the time a full knowledge of the conditions on which such registration could be effected, I presume you will withdraw your name from the matter altogether; if not, please confirm your adherence to your declaration."

Then the Act of Parliament is sent to that gentleman, and he answers it on the 19th July in these words, "Dear Sir,—Since I was favoured by you with the Pharmacy Act of 1868, I have considered its provisions, and wish to withdraw my declaration relating to Mr. Whisken, of Welshpool, as I cannot allow my name to be attached to a document upon which a shadow of doubt exists."

(*Their Lordships consulted.*)

Mr. Justice Lush.—Does it appear that the Council had decided?

Mr. Quain.—Yes; the resolution of the Council is set out in the affidavit.

The Lord Chief Justice.—I cannot help thinking, Mr. Bullen, that unless you are prepared to show that there has been something altogether exceptional, or something arbitrary in the decision of the Council in the course of the case, we cannot take upon ourselves to review their exercise of the jurisdiction and authority, which is clearly vested in them. They are the proper persons to decide it, and it is within their competency.

Mr. Quain.—I should say that we have offered him a rehearing if he likes, and he has declined it; I can read the letter.

Mr. Bullen.—I am told that is not so.

Mr. Quain.—Don't say that, because I will read, from the affidavit, what we have offered. As the Council was most anxious that justice should be done, this letter was written by Mr. Bremridge, "I am in receipt this morning of a letter from Messrs. Howell, Jones and Howell;" they are his attorneys. "If you like to make an appeal to the Council yourself,"—that is, a second appeal, after the first case has been decided,—"I will lay the matter before them again, in this case. Please let me have your appeal this week, so that it may be presented next Council day. In the meanwhile, as your name does not now appear on the register; if you continue to carry on business, it will be the duty of this Society at once to institute proceedings against you." After that we get an answer from Messrs. Howell, Jones and Howell, the attorneys: "Our client has handed to us your letter of yesterday to reply to. He declines to make any appeal to the Council, and, notwithstanding your communication, intends to continue his business."

Mr. Bullen.—Your Lordships will find from our affidavit, that so late as the 10th February, 1871, in this year, Mr. Whisken went before the President of the Council and had an interview with him about the matter. That letter was written by Messrs. Howell and Jones. How it came to be written I don't know; but he has been before them since.

Mr. Justice Lush.—What did the President say? He is not the Council.

Mr. Bullen.—He is President of the Council. That appears upon my affidavit, on which I moved.

Mr. Justice Lush.—How does that appear?

Mr. Bullen.—I will read it. "On or about the 10th day of February, 1871, I had an interview with Mr. G. W. Sandford, the President of the said Society, who advised me to lay a full statement before the Council by way of appeal, promising that it should be laid before the Council's monthly meeting, held the 1st day of March, 1871, and that I should hear the result of their decision, immediately after, and that all proceedings were stayed against me for the present." If your Lordship remembers, we were being sued in the County Court for penalties. And, "I accordingly, on the 27th of the same month of February, sent a full account of the facts, as also copies of the letters or certificates now produced and shown to me, marked respectively C, D, E, F and G, enclosed in a letter to the said Mr. Sandford, copy whereof is as follows:—'Welshpool, 27th February, 1871. Dear Sir, —I have sent you a copy of statement, also copy of some of the letters that I am in possession of, shall be greatly obliged if you will lay the same before the Council. I think you will see by the enclosed that I have been subjected to the greatest insults, and the conduct of your local secretary here has been most disgraceful; a part of which has been in this place disposed of before the magistrates.'" Now, in one of my affidavits we show that the local secretary and himself had been summoning one another before the magistrate, and were at daggers drawn, and that the whole proceeding has arisen from jealousy. 'I also think it my duty to inform you that every time my name has been appended in the Journal it has been publicly exhibited by your local secretary. Thanking you for the kindness and courtesy shown towards me when last in London. I am,'" etc. Then the affidavit goes on:—"Not having heard either from the said Mr. Sandford or the Registrar, Mr. Elias Bremridge, I, on the 20th day of March, 1871, sent the following letter to the said Mr. Sandford, which I caused to be registered: —'Welshpool, 26th March, 1871. Dear Sir,—I delivered my statement to you before March 1st, 1871, as registered, and this being the 20th, I think I ought to have heard something from you respecting the decision of the Council in my case before now. Will you kindly inform me by return what decision the Council came to, and oblige,' etc.; and on the 24th of the same month of March, received a reply as follows:—'March 22nd, 1871. Dear Sir,—Your statement was laid before the Council at its last sitting, and, as we only meet on the first Wednesday of each month, may be said to be still under consideration. After Wednesday, April 5th, you will, doubtless, hear definitely from the Registrar. In the meantime you know all the proceedings against you are stopped. Faithfully yours, G. W. Sandford.' I then heard nothing more of the matter until the 15th day of May instant, when I was served with the County Court summons now produced and shown to me marked H; and on the 17th day of may instant, I wrote the said Mr. Elias Bremridge as follows:—'Welshpool, 17th of May, 1871. Sir,—Not having heard in reply to the statement forwarded to your President on the 26th February last, to be laid before the Council, and having been served with a County Court summons for the recovery of a penalty of £5, I beg to apply to the Pharmaceutical Society to insert my name on the Register of Chemists and Druggists for the present year, and that on default thereof, I intend to apply for a *mandamus* to the Court of Queen's Bench to compel the insertion of my name, and I have to request an immediate reply to this application. Yours, etc., E. C. Whisken.' And, on the 24th day of the same month of May, I received a reply from Messrs. Flux and Co., Solicitors to the Pharmaceutical Society." So that the answer after we had been sued, only came from Messrs Flux and Co.:—"Sir,—Your letter of the 17th instant, addressed to E. Bremridge, Esq., Registrar, 17, Bloomsbury Square, has been handed, by that gentleman, to us. On reference to the Pharmacy Act, you will find that the action brought against you is by the Registrar of the Pharmaceutical Society with the authority of the Council. You may be sure that the Council did not give authority until after full consideration of your case. We may mention that one of the members of the Council was deputed to visit Welshpool, and made inquiries, and that the Council are fully satisfied that the action brought is proper in all respects."

Mr. Quain.—Now allow me to interpose for a moment. So far from that being the case, as my learned friend has just stated, I have an affidavit in my hand of the President, in which I have got this statement: that they took the trouble of sending one of their own Council to Welshpool, to investigate the matter again. I have the affidavit of the gentleman who went down to Welshpool, and, so far from there being no communication with Mr. Whisken, I have his letters, in the affidavit to the President, on the subject after the statement was sent in. It is in Mr. Sandford's affidavit. He says, "Mr. Whisken called on me on the 10th day of February last. I listened to what he had to say, and told him that his best course was to lay a full statement (by which I meant an accurate statement) before the Council by way of appeal, promising that it should be laid before the Council's monthly meeting to be held on the then next first of March, and that he should hear the result of their decision afterwards, and that I would request the solicitors to hold their hands until further instructed, and I did afterwards accordingly so request the said solicitors. The said E. C. Whisken having sent to me the letter of the 27th February, 1871, set out in his affidavit, together with the documents therein referred to, I laid them before the meeting of the Council which was held on Wednesday, the 1st day of March, and they were considered, and proceedings then took place as expressed in minutes of that meeting in the words following:—'Registration of E. C. Whisken, of Welshpool. An appeal and affidavits in support of Mr. Whisken's claim to registration having been read, it was resolved, That Mr. Abraham be authorized to visit Welshpool, and to make personal inquiry as to the claim of Mr. Whisken to be restored to the register of chemists and druggists, and report to the next Council meeting.' I subsequently received from the said E. C. Whisken his letter of the 20th March, 1871, and replied by mine of March 22nd, 1871, set out in his affidavit. The statement in the said affidavit which immediately follows the copy of my letter dated 22nd March, 1871, and which is in the words following—'I then heard nothing more of the matter until the 15th day of May instant, when I was served with the County Court summons'—is absolutely untrue, so far as it is inconsistent with the following facts, for I say that the said Mr. Abraham did discharge the duty undertaken by him at the Council, and go from Liverpool to Welshpool and investigate the matter, and have an interview with the said E. C. Whisken; and that on March 28th, 1871, the said E. C. Whisken wrote and sent to me a letter which contained clauses as follows:—'I received your letter on the 24th inst., and on the 25th a person called upon me from Liverpool, stating himself to be one of the Council, and giving his name as John Abraham. He said he was in possession of my statement, and also copies of letters, and wished to see the original letters, which I allowed him to do. He then asked me a series of what I thought were impertinent questions, adding insult to injury; he also wished me to read some prescriptions which he had brought with him, but, taking into consideration the facts of the case, I declined to comply with his request. . . . I shall therefore be glad to know whether the Council had authorized Mr. Abraham to call and catechise me in the way he has done, and to hear the result of its meeting on the 5th proximo.' I also received from the said E. C. Whisken another letter, dated April 3rd, 1871, also referring to the said call of Mr. Abraham. Mr. Abraham attended the meeting of the Council on the first Wednesday in April last, and proceedings took place thereat, and produced a report which was considered by the Council, and appeared to be conclusive against the claims of the said E. C. Whisken, and the Council accordingly rejected and referred the documents and evidence in reference to the case to Mr. Flux, with instructions to take such further action in conjunction with the Registrar as might be desirable or necessary. In all the minutes aforesaid the Council of the said Society acted *bonâ fide* and in the exercise of the best of their judgment; they have been anxious to discharge the duty committed to them for the protection of the public in the matter of the sale of poisons, and at the same time most desirous not to act unjustly to the said E. C. Whisken."

The whole thing has been thoroughly investigated.

The Lord Chief Justice.—If we had known all this we should not have granted the rule.

Mr. Bullen.—That is an affidavit that I have not got a copy of. My Lords, what we say is this, that opposition has been got up by Mr. Williams, who is the local secretary to the Society down there.

The Lord Chief Justice.—Whose duty it is to make any communication to them if any one is carrying on business as a chemist and druggist who is not qualified.

Mr. Bullen.—But we say the information that was given to the Society has not been true information.

The Lord Chief Justice.—They were willing to give you an opportunity of being reheard, which I do not know that they are now bound to do, as you have allowed the time to pass. Still they are willing to give you an opportunity of going before the Council again.

Mr. Bullen.—I should have said that your Lordships had power to have this matter inquired into.

The Lord Chief Justice.—So we have, if we see any abuse of the authority of the Council. *The powers given to them are so salutary, and the exercise of them so desirable for the protection of the public, that unless we see a case of manifest injustice and oppression we do not interfere.* So far from seeing anything of that kind here, as far as I can judge, it appears that what has been done by the Council has been properly done. I do not wish to say anything more.

Mr. Bullen.—What I wish to submit to the Court is this, that I have sufficient evidence before the Court, in the shape of affidavits from medical practitioners in the place, for it to be said that the Council has been misinformed.

The Lord Chief Justice.—If they have been misinformed, they can correct anything they have done; that is to say, if you would be so good as to condescend to go to the proper tribunal, that is, the Council, and satisfy the Council that they have acted improvidently in the case.

Mr. Bullen.—I should submit it is rather late in the day for them to say they are ready to hear it again.

Mr. Justice Lush.—A man who declines to satisfy them that he can read a prescription, surely is not entitled to come here for a mandamus.

Mr. Bullen.—We have satisfied them.

Mr. Quain.—On the contrary.

Mr. Justice Lush.—On the contrary, you have not.

Mr. Bullen.—We have the affidavits of several medical practitioners who have examined this man. But there is this difficulty, my Lords, they have put us in the County Court.

Mr. Justice Lush.—You deserve to be there if you have been practising without a qualification. This is an indirect mode of preventing that action being tried.

Mr. Bullen.—No, my Lord, we say "you wrongfully refused to qualify us, and therefore we go to the Court of Queen's Bench to make you do it. We are prepared to say to the Court of Queen's Bench we have satisfied the Act in all respects." That is what I ask your Lordships to do, and to hear the affidavits, and say whether you are not satisfied that we are properly qualified to be put on the register.

The Lord Chief Justice.—What for? However, if you have anything to say we will hear you.

Mr. Bullen.—I do not wish to keep the case up if your Lordships have made up your minds; but I should ask your Lordships to impose, so to say, the rehearing of our case before the Council itself.

The Lord Chief Justice.—They offer that.

Mr. Quain.—We have done that twice.

Mr. Bullen.—Are you ready to do it again? that is the question.

The Lord Chief Justice.—Up to the present time you have declined to avail yourself of that offer. It is not for us, under those circumstances, to impose any condition. The Council will do what they think to be right. If they have thought it right to say they will give you a further hearing, I have no doubt they will continue to say it, without our interfering. I think there is no alternative but to discharge the rule, and to discharge it with costs. If a man will be obstinate, and not submit himself to the proper authority which has been authorized by the Act of Parliament to consider whether he is entitled to practise or not, and will come here, he must pay the expenses.

Poisoning by Arsenic.

An inquiry into the deaths of Mrs. Matilda Harper, wife of Mr. William Harper, farmer, of Linley Hill, near Beverley, and of Lily Marian Taylor, their grandchild, was held on Friday last. On the 25th ult., Mrs. Harper, Miss Harper and the child Taylor, in the absence of the male members of the family, partook of tea, and during the meal the child was taken ill. Mrs. Harper, who for some time previously had been in delicate health, soon afterwards became indisposed, and as they grew worse assistance was sent for. Dr. Calvert, of Brandesburton, ascertained that they were suffering from the effects of poison. Everything possible was done to alleviate their agonies, but medical aid was of no avail, and both Mrs. Harper and her granddaughter died next day. Miss Harper and Hannah Bromby were also taken ill after tea, as was also Henry Dunn, a bricklayer, working at the house, but they were ultimately restored. An inquest was opened on the bodies on the 20th ult., evidence was given to show that red lead had been used by the family during cleaning time, and the hypothesis was entertained that the water used for the tea might have become impregnated with the poison. A pump, which had been for a time disused, was repaired the same day, and the water for the tea was taken from this pump. Other persons, however, who were not affected, drank from the pump spout shortly after it was mended, and this fact tended to show that poison must have been contained in some of the vessels in which the water had been placed from the time of its extraction from the pump to coming on to the table. The kettle, teapot, etc., were carefully taken care of by the police, and the inquest was adjourned in order that the viscera of the child and the contents of the vessels might be analysed.

Miss Mary Anna Harper said: Red lead was used on Thursday. Hannah Bromby filled the kettle on the day of the accident from the pump. No one told her to put the kettle on the first time. She put it on the kitchen fire on her own account. It was her duty to do so. The kettle boiled some time between four and five o'clock. When it boiled, I told her to take it off and refill it from the river. When it boiled over, I saw some stuff of a slate colour come from the kettle, and I told her to fill it from the river. She took it out of the kitchen into the back kitchen, and I suppose into the yard. I had not noticed the kettle boil over in that way before. She was just going out of the kitchen where I was, when I told her to refill it from the river. She could not help hearing me. During the time the pump was disused, about three weeks, we used the water from the river for drinking purposes. We have not lately used soda in the tea, not for three or four months perhaps. Do not remember using it since Hannah Bromby came to us. Did not observe anything the second time the kettle boiled. Do not remember looking. My mother filled the teapot as soon as the kettle boiled a second time. I gave Marian Taylor about a quarter of a mug full of tea first, and about as much milk. It was not a large mug. She did not drink above half of it. She complained of being sick, and mother gave her a drink of her tea in a saucer. She drank about a quarter of a saucer full. She had not been sick before, but only complained. As soon as she got the tea out of the saucer she was sick before she could get out of her chair. I then got some tea and also began to be sick. Bromby at that time was in the back kitchen, and also looking out of the front kitchen door. That morning there had been a disagreement between my mother and the under-girl. There had also been one once before. On the Thursday morning (the day of the occurrence) mother told her to sweep up the back kitchen. I did not hear her say anything in reply. When I came down, the other girl told me that Bromby had been saucy to my mother. I spoke to her and told her I should not have my mother insulted. She did not say anything to me and I told her she should leave. I believe I said she should go at once. My mother was first sick on the lawn.

By Dr. Procter: The substance that boiled up out of the kettle was not like red sand.

Mr. William Procter, of York, deposed: I am a doctor of medicine and Fellow of the Chemical Society, London. I received on Sunday, the 21st of May, from Dr. Calvert, the following articles, viz. No. 1 jar, containing a liver and portion of intestine. In both I found a small quantity of arsenic. Another jar contained a stomach and its contents. That I found, on examination, to be considerably inflamed, and contain a small quantity of stringy mucus, with matter like white of egg, which chemically I found it to be. In this, also, I detected arsenic. No. 3 was a pint bottle, labelled water from the pump. On standing, that deposited a brown matter, which I separated by filtration, and found to consist only of organic matter. In neither the water nor the deposit could I detect any trace of arsenic or lead. No. 4 was a bottle containing about four ounces of water said to be obtained from the kettle. On standing, it deposited a reddish-brown powder. This I separated by filtration. In the first instance I distilled the clear water filtered from the powder. I found nothing in the distillate. I then examined the water, and from the quantity of water given to me, about four ounces, I separated 12 grains of sulphide, or yellow arsenic, which is equivalent to 9½ grains of white arsenic. I then examined the brown powder which I had separated by filtration. That contained very slight traces of arsenic, and I found it to be composed of carbonate of lime and oxide, or rust of iron. (Witness explained that he did not expect to find arsenic in quantities in the powder; it was soluble, and would be found in the water.) No. 5 was a bottle containing Mrs. Harper's last vomit. That contained a large quantity of greenish deposit, which the microscope showed to consist of mucus containing partly digested food, and a few muscular fibres and fat globules. I found, by examination, that the green tinge was due to bile. I detected no mineral poison. No. 6 was Mrs. Harper's fæces. In that I detected no mineral poison. No. 7 was given to me as the under-servant's vomit. It contained some whitish particles floating in it, which the microscope showed to be partly digested food and fat mixed with mucus. This I verified chemically. I detected no arsenic, lead, or other mineral poison in it. No. 8 was given me as the upper-servant's vomit. I found it contained a very large quantity of flaky matter, which was evidently food. I detected no poisonous matter at all. No. 9 was a bottle which contained water, and a reddish powder adhering to the sides and to the bottom of the bottle. This I found to be a mixture of litharge and red lead with some oily matter. I found no arsenic in it. On Tuesday, the 23rd of May, I received from Mr. Calvert the following articles, namely, No. 10, an iron kettle. At the time he brought it to my house it contained about a tea-cup full of water. In his presence, in that water, I showed the presence of arsenic. The kettle is very much furred with oxide of iron. (This, witness said, was only the ordinary fur.) No. 11 was a caddy, containing about a teaspoonful of tea. That contained no poisonous substance. Several other packages I received, but I found no arsenic in them. No. 19 was a red powder, but it contained no arsenic. The packages, from No. 15 to 19, I received from Superintendent Wright, on the 29th of May. The others I received from Dr. Calvert. I received others up to No. 25, which were of no importance. No. 26 was a tin case in which was a sod, on which had been vomited matter. I examined it carefully. It gave no indication of any poisonous matter, except arsenic, which I found in it. No. 27 was a portion of soil, but it contained no arsenic. It has been stated that some soils contained arsenic, but this did not.

In reply to Lieut-Col. Layard, Dr. Procter said he had received communications from large manufacturers of colours, and found that the practice to mix red lead with arsenic to adulterate it was unknown. Since this occurrence he had analysed red lead from nearly all the retail dealers in York, and found no arsenic. With regard to the existence of arsenic in water he might say that cold water would take up a grain or a grain and a half, whilst water which has been boiled and allowed to cool would take up perhaps 12 grains.

Dr. Calvert, of Brandesburton, deposed: On Thursday, the 18th May, about a quarter to eight o'clock p.m., I received a note from Mrs. Harper stating that Megson, from Leven, had been repairing their pump, after which the girl had filled the teakettle. Tea having been made, the family had partaken of it, and were immediately taken ill. The writer requested that I should send them something to do them good. I considered the matter well over, and considered it my duty to proceed to the house, as I suspected it was a case of poisoning. My suspicions were more confirmed on meeting a young man named Watson Dunn, jun., coming for me to visit his brother, who had just arrived from the Harpers, and who was suffering from violent vomiting and other symptoms. His residence being in the way to the Harpers, I first visited him and found him suffering from violent vomiting, attended with pains at the stomach, with heat and burning at the back of the throat, headache, great thirst, drowsiness and general collapse. The skin was cold and clammy and the countenance pale; the pulse small and scarcely perceptible. He had vomited freely on his way home, and had had an emetic administered. I gave him certain directions in the way of treatment, and then proceeded to the Harpers. On my arrival I found Miss Harper and the child reclining on a couch. I at once inquired what was the matter, and Miss Harper told me that after partaking of tea the child, her mother and herself had commenced to vomit. I proceeded to examine Miss Harper and the child, and found them suffering from similar symptoms to those from which Henry Dunn was suffering. I then inquired for Mrs. Harper and found her in bed. She got up and came down to see me. In the meantime Mrs. Harper referred me to the under-girl, Hannah Bromby, who she said was suffering the same way as the rest of the family. I proceeded to the kitchen and found Bromby suffering, as far as I was able to judge at the time, from the same symptoms as the rest of the family. I administered the usual remedies in cases of irritant poison, and, after a space of about three hours and a half, found my patients to a certain extent rallied. I returned to Leven, and finding Dunn somewhat better I went home and forwarded medicine to each patient. About half-past three next morning I was again summoned, and arrived soon after four. I found that the child had died in the meantime. Mrs. Harper was suffering from a great amount of collapse, and I requested Mr. Harper to send for Dr. Boulton. In the meantime I administered stimulants, and had the satisfaction of finding Mrs. Harper gradually rallying. About seven o'clock I was summoned to Leven to a case, and, considering that Mrs. Harper had, to some extent rallied, and expecting the presence of Dr. Boulton shortly, I left. On returning, about eleven, which was as early as I could get, I met Dr. Boulton coming to Leven from Linley Hill. On asking him how Mrs. Harper was, his answer confirmed the opinion I had formed at seven o'clock that she was rallying. He returned with me to Linley Hill, but unfortunately our favourable prognostics was doomed to be fallacious, we found Mrs. Harper gradually dying, and she expired a little before one. We administered stimulants and other remedies applicable to the case. On Saturday morning, by the coroner's orders I proceeded to make a post-mortem examination on the body of the child Marian Taylor. I found oozing from the nostrils a thick brownish matter, and on proceeding to open the abdomen I found the peritoneum in a highly congested state. I exposed the stomach and intestines. I did not open the stomach, but removed it for the purpose of analysing the contents. I also removed the liver and a portion of the smaller intestines, which, with the stomach, I placed in jars. The contents of the abdomen were in a congested condition throughout. I did not examine any other organ. On the Friday morning, early, I inquired for the kettle in which the water had been boiled from which the tea had been made, and of which Mrs. and Miss Harper and Marian Taylor had partaken. It was brought to me by Elizabeth Ash, the upper-girl. I found it to contain a small quantity of water, which I poured into a clean bottle. The kettle and bottle were given over to Superintendent Wright. I procured the fæces and last vomit of Mrs. Harper and locked them up. I took to Dr. Procter, of York, on Sunday, the 21st, in jars, the liver, stomach and portion of small intestines of Lily Marian Taylor, a little bottle containing water from the pump, a bottle containing water taken from the kettle, Mrs. Harper's last vomit, Mrs. Harper's fæces, the under-servant's vomit, the upper-girl's vomit, and a jar containing red lead in suspension. On Tuesday, the 23rd of May, I took to York, to Dr. Procter, the iron kettle, which I received from Superintendent Knight, a teacaddy containing a small portion of tea, a bottle containing water from the foldyard pump, some anti-smut powder, white crystalline powder, and another packet of powder from the bacon-house.

As soon as I arrived at Dr. Procter's, on the Tuesday, he proceeded to show me certain tests applied to about a teaspoonful of water, which was in the kettle, on my delivering it to him. The tests applied indicated fully the presence of arsenic.

Mr. James Douglas Wright, Superintendent of Police at Leven, deposed: On the morning of Friday, the 19th of May, from information I received, I came to Mr. Harper's, where I was shown the dead body of Lily Marian Taylor. It would be between eight and nine o'clock in the morning. I made inquiries, and received from Mr. William Harper a bottle containing water, numbered 4. On a shelf in the front kitchen was a basin containing the vomit of the under-girl, Bromby. In the servants' bedroom I found the vomit of the upper-girl, Elizabeth Ash. A puncheon, containing water and a mixture of red lead, was handed to me by the charwoman, Mrs. Newman. A teakettle was handed to me by Mr. John Harper the same morning. A teacaddy I found on a sideboard in the room. On the 22nd I took a bottle full of water from the foldyard pump. I took possession of a packet of smut powder from the saddle-room on the 19th, also a packet of alum powder from the saddle-room, and some powder taken from the bakehouse. These articles were locked up by me in a closet in the house as well as some ducks. On the 20th I delivered up to Dr. Calvert, by the directions of the coroner, several of those articles, and on the 28th I delivered up others. On the 23rd I made a further search here, and found in a closet, in the front kitchen, a paper containing powder, numbered 16, and a tin canister containing some other powder. I also found a packet of anti-smut powder and other powders, a paper of horse-balls, a bottle containing liquid, a bottle containing consistency like paste, and a teapot containing sundry bottles. The latter I found in a bureau in the room. These I locked up in the kitchen closet, the key of which I have yet. On the 24th, I was shown by Miss Harper the first and second vomits of Mrs. Harper on the lawn. I took up the sods, and placed them in a tin canister. I also, at a distance of eight or ten paces from these vomits, took up some of the sods and earth on the lawn, which I also placed in a tin. On Monday, the 29th May, I handed to Dr. Procter, of York, several of these articles. On Friday morning, the 19th, I searched the female servants' boxes, but found no packages in powder of any description there. I have since made inquiries at Beverley, Driffield, Leven and the neighbourhood of all chemists relative to the sale of any arsenic, but cannot hear that any has been sold at any of these places recently that was likely to have been got by any of the servants about here.

Mr. John Robert Harper stated that on Friday morning, the 19th ult., he gave the kettle, from which the water had been taken for tea, to Superintendent Wright. Witness got it from the boiler top in the front kitchen. He got his tea in the kitchen, on his return with his father from Beverley fair, about eight o'clock on the previous night. He took tea alone, and the water used was from a small kettle. The other kettle was near the fireplace then, and was in the same position the next morning.

Henry Dunn, of Leven, bricklayer, deposed that on Thursday, the 18th of May, he was working at Linley Hill. About a quarter to six o'clock he came from upstairs, where he had been working, into the kitchen, and sat down to tea. The child was sick then. He drank from half to three-quarters of a cup out of a basin, and as it was nasty he did not sup any more. He had not got above two or three hundred yards from the house when he was taken sick, and vomited three or four times before he got to the Hall Garth, where he got a drink of water. He then went to Leven and got two emetics at the druggist's shop. He went home with them and took them both, one about an hour after the other. He vomited until about one o'clock in the morning, when he felt somewhat better, and by the leave of Dr. Calvert, who had attended him twice, went to bed.

By Mr. Harper: Before I started to go home the upper-girl, Ash, asked me when I was near the pump, if I had drunk any tea. I said yes. She then asked me if I thought it was pump water that made it nasty. I said I did not know, but if I had got more I should have been sick then. She appeared to think I was more frightened than hurt.

Thomas Matthew Gilbert deposed that he was shepherd to Mr. Harper. On Thursday night, the 18th ult., he went through the yard to see the sheep, about a quarter to seven o'clock, and saw the under-girl, Bromby, vomiting at the swine tub. Witness asked her what was the matter, and she said she was sick, but she did not know what with. She had only had cold water from the pump. He went into the back kitchen, and the groom said to him that they were all sick, but did not know what with. Witness then went and sat down to his supper in the front kitchen. Miss Harper sat by the fireside, and the charwoman had the little girl on her knee. He asked them what the matter was, and one of them said they were all sick with the tea. Witness told them that if they thought there was any poison in it, they had better send for the doctor. Miss Harper wrote a note, and sent the groom for the doctor.

This concluded the evidence, and the jury, after a short deliberation, returned a verdict of "Wilful Murder" against some person or persons unknown, the deceased having been in their opinion feloniously and with malice aforethought poisoned by the administration of arsenic, but by whom administered there was no evidence to show.

NEW READING OF THE PETROLEUM ACTS.

BY BOVERTON REDWOOD, F.C.S.

Secretary and Consulting Chemist to the Petroleum Association.

Considerable misapprehension appears to prevail in reference to the Judgment recently delivered in the Court of Queen's Bench in an appeal against a conviction under the Petroleum Acts. The judgment in question involves a new reading of the Acts of a somewhat unexpected nature; and a very general impression exists that, whereas a licence has only hitherto been needed for such petroleum as gives off inflammable vapour below 100° F., it is now, in consequence of this judgment, unlawful to keep any description of petroleum, except in pursuance of a licence. This opinion is in fact embodied in the following notice, which has been circulated in the town of Cambridge:—

"Borough of Cambridge. The Court of Queen's Bench having decided that all persons dealing (without a licence) in petroleum or any product thereof, whether it gives off an inflammable vapour at a temperature of less than 100 degrees Fahrenheit or not, are liable to the penalties imposed by the Petroleum Acts. Notice is hereby given, that proceedings will be taken against all persons found dealing therein, contrary to the provisions of the Petroleum Acts, on and after the 15th day of June instant.

"By order, EDMOND FOSTER, Town Clerk.

"*Guildhall, 5th June*, 1871."

It will, however, be evident from a consideration of the facts of the case that such a view is not in accordance with the decision of the Court.

The appellant, an oil merchant, was charged before the Surrey magistrates, under the Petroleum Acts, with keeping, otherwise than for private use, within fifty yards of a dwelling-house, a quantity of petroleum without being licensed in accordance with the said Acts. On the hearing of the information it was admitted by both parties that the petroleum in question did not give off inflammable vapour at a temperature of less than 100° F.; nevertheless, the magistrates convicted the appellant and adjudged him to pay a fine of ten shillings and costs, a case being granted for the Court of Queen's Bench. The case was argued before Mr. Justice Blackburn and Mr. Justice Mellor; Mr. Grantham appearing for the appellant and Mr. Lord for the respondent. Mr. Grantham contended that as the petroleum in question did not give off inflammable vapour below 100° F., it did not come within the following definitions contained in the Acts of 1862 and 1868:—

1862. "'Petroleum,' for the purposes of this Act, shall include any product thereof that gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer."

1868. "For the purposes of the Petroleum Acts, 1862, 1868, including all local acts and bye-laws relating to petroleum or the produce thereof; 'petroleum' shall include all such rock-oil, Rangoon oil, Burmah oil, any product of them, and any oil made from petroleum, coal, schist, shale, peat, or other bituminous substance, and any product of them, as gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer."

The Court, however, held that it was not sufficient to show that the petroleum in question did not give off inflammable vapour below 100° F. in order to prove that it was not "petroleum" within the meaning of the Acts; since the Legislature, by the use of the words "shall include," evidently intended that "petroleum" (legally used) should mean, not only all such products of petroleum and the other substances mentioned in the Act as give off inflammable vapour under 100° F., but also petroleum itself (as distinguished from the products of petroleum) unconditionally. Mr. Grantham argued that the words "shall include" had always been construed in the sense of "shall be confined to," and that, although it was possible that a wrong word might have been used, yet that the intention of the Legislature was in accordance with what he contended for. In this sentiment the Court could not concur, Mr. Justice Blackburn remarking:*—"It is very common in the interpretation clause of an Act of Parliament to say that a parish shall include a township, but it never could be contended with success that a parish is confined to a township." Mr. Grantham was unprepared for this distinction being drawn between petroleum and the products of petroleum, and therefore found himself in a difficulty. The liquid in question had, as is usual in such cases, been spoken of by both sides as petroleum; the term petroleum being, of course, used in its ordinary commercial sense; in fact, it had been admitted by the appellant to be petroleum commercially speaking, though it was denied that it was "petroleum" within the meaning of the Acts. Now, however, it was clear that, according to the definition of the Court, the liquid should have been termed a product of petroleum which, scientifically, it undoubtedly was. This Mr. Grantham explained, and the following argument ensued:—

Mr. Justice Blackburn: "I thought the case had found that it was what is called petroleum."

Mr. Grantham: "The term, as used in the trade, is applied to that which you go into a shop and buy, and at once put in your lamp and burn."

Mr. Justice Blackburn: "I should have inferred that that was a product of petroleum, not petroleum itself."

Mr. Grantham: "It is assumed that that which is the subject of the argument is what is commonly called petroleum."

Mr. Justice Blackburn: "If there has been a mistake, and that this was not petroleum, but the product of petroleum, he has lost his ten shillings; the penalty is nothing; it is the principle."

Mr. Grantham: "If there be any doubt as to that, I should ask that the case may be re-stated."

Mr. Justice Blackburn: "It would cost twenty times as much as it is worth. Assuming this to be petroleum, and not a mere product, it is required that it should be licensed, although it does not throw off this vapour."

The case therefore proceeded on the assumption that the liquid in question was petroleum as distinguished from the products of petroleum, or, in other words, was crude petroleum, Mr. Justice Blackburn remarking: "The only question in this case is, whether that [the interpretation clause] does not include crude petroleum, or natural petroleum, which gives off this vapour or not." The decision of the Court will be evident from the following extracts from the judgment:—

Mr. Justice Blackburn: "I think the object and intention of the Legislature was, that petroleum, as im-

* This quotation and similar ones are from a transcript of the shorthand writer's notes, which Mr. Grantham has assured the writer are substantially correct.

ported in its natural state, should not be stored without a licence." . . . "I have, therefore, come to the conclusion" . . . "that the petroleum, not being a manufactured petroleum but petroleum proper, may not be kept and stored without a licence."

The new reading of the Acts as embodied in this judgment, therefore, amounts to this, that "petroleum" (legally speaking) has a double meaning; it means:—

1. Any product of petroleum or other substance mentioned in the Act of 1868, provided it give off inflammable vapour below 100° F.
2. Petroleum proper (as distinguished from the products of petroleum), or, in other words, crude petroleum, unconditionally.

This new reading, though doubtless at variance with the intention of the Legislature, is, as will be seen, of no practical importance, if it be understood, as crude petroleum is not now imported; it is however a hardship that dealers should be subjected to the unjustifiable annoyance, arising from those in authority being unacquainted with the real meaning of the judgment.

It should be distinctly comprehended that the oil imported from America, known in the wholesale trade as "refined petroleum," and sold in the shops under the names "petroleum," "rock oil," "crystal oil," etc., is, not only scientifically, but also in the eye of the law, "a product of petroleum," and that, as such, no licence is needed for storing it, provided it does not give off inflammable vapour below 100° F. when tested in accordance with the Act.

Note.—Since the above was forwarded to the Editor, a Petroleum Bill, now before the House of Lords, has been printed. This Bill contains a new interpretation clause, which is a great improvement on those of the existing Acts; and although the term "include," which has caused so much trouble, again makes its appearance, there can be no doubt that, should the Bill become law (in which case the Acts of 1862 and 1868 would be repealed), much of the ambiguity which at present attaches to the word "petroleum" would be removed.—B. R.

"*Baltic*," *E.C.*, *June* 19*th*.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

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Hydrargyri Subchloridum.—Mercuric sulphate is first triturated with a quantity of metallic mercury equal to that which it already contains, the combination being assisted by moistening with a few drops of water. A grey powder is thus obtained which is practically mercur*ous* sulphate.

$$HgSO_4 + Hg = Hg_2SO_4.$$

From this equation $HgSO_4$, or 296 parts of the sulphate, require Hg or 200 parts of the metal, forming 496 parts of the mercurous sulphate.

Chloride of sodium is then added and the mixture sublimed with the aid of a pretty strong heat.

$$Hg_2SO_4 + 2NaCl = 2HgCl + Na_2SO_4.$$

If the sublimation is conducted in a small flask or pot, so that the vapour condenses upon a warm surface and but slowly, crystalline masses are obtained, a form which would be unsuitable for administration in medicine. The vapour is therefore driven from the subliming pot into a pretty large brick chamber, in which, in consequence of the sudden cooling effected, the calomel condenses in the form of a fine dust. This is washed with boiling water, to remove from it the traces of corrosive sublimate that are invariably produced.

Calomel, in the pulverulent state, as produced by sublimation, is not a white powder, but has a yellowish tint, which is increased by trituration in a mortar.

[§ Digested with solution of potash, it becomes black; and the clear solution, acidulated with nitric acid, gives a copious white precipitate with nitrate of silver.] The black compound is of course mercurous oxide, chloride of potassium being left in solution.

[§ Contact with hydrocyanic acid also darkens its colour.] The result, however, is not a definite mercurous cyanide, but a mixture of metallic mercury, calomel and a cyanide, or probably a chlorocyanide. [Warm ether, which has been shaken with it in a bottle, leaves, on evaporation, no residue.] This shows the absence of corrosive sublimate.

Calomel may be prepared according to other methods; one which was at one time employed consists in precipitating a solution of mercurous nitrate with common salt.

In undergoing volatilization, there can be no doubt that calomel undergoes decomposition into free mercury and mercuric chloride, recombination ensuing when it again condenses. In consequence of this, the specific gravity of the vapour connot, in this case, be taken as any evidence of molecular weight.

Hydrargyri Sulphas.—Mercury is boiled with strong sulphuric acid, the heat being continued until the metal has disappeared and a dry, white, crystalline powder remains:—

$$Hg + \underbrace{H_2O_2SO_2}_{\text{Sulphuric acid.}} + H_2SO_4$$

$$= \underbrace{HgSO_4}_{\text{Mercuric sulphate.}} + \underbrace{H_2O}_{\text{Water.}} + H_2O + \underbrace{SO_2}_{\text{Sulphurous acid gas.}}.$$

Mercuric sulphate is decomposed by water with formation of "turpeth mineral," a mercuric oxysulphate:—

$$3HgSO_4 + 2H_2O = Hg_3SO_4O_2 + 2H_2SO_4.$$

Hydrargyrum.—This important metal is obtained almost exclusively from the native sulphide, HgS or cinnabar, by one of two processes. Either the mineral is roasted in a current of air, which oxidizes the sulphur into the permanently gaseous SO_2, the mercury being simultaneously carried in the state of vapour through a series of earthen pipes, where it condenses to the liquid state and runs into a reservoir; or the powdered mineral is distilled with lime, when a mixture of sulphide and sulphate of calcium remains behind with the excess of lime and the gangue, and metallic mercury distils over.

The impurities contained in the mercury of commerce are principally traces of lead, zinc, tin and bismuth. Mercury so contaminated does not form bright spheroidal globules, but each one leaves a trail behind it. These impurities are best removed by redistillation, but the mercury may also be rendered sufficiently pure for ordinary purposes by agitation with a small quantity of nitrate of mercury and subsequent straining. Pure mercury is entirely volatilized by heat and leaves no residue. It boils at 680° F. Specific gravity, 13·596.

HYDRARGYRUM AMMONIATUM.—A solution of perchloride of mercury in water is poured into solution of ammonia, and the precipitate collected, washed free from sal-ammoniac and dried at 212°:—

$$HgCl_2 + \underset{\text{Ammonia.}}{NH_2H} + \underset{\text{Ammonia.}}{NH_3}$$

$$= \underset{\text{Amido-chloride of mercury.}}{HgNH_2Cl} + \underset{\text{Sal-ammoniac.}}{NH_3HCl.}$$

Ammoniated mercury is an opaque white powder, which often has a slight yellowish tinge, which is increased by prolonged washing.

[§ Digested with caustic potash, it evolves ammonia, acquiring a pale yellow colour, and the fluid filtered and acidulated with nitric acid gives a white precipitate with nitrate of silver.]

$$Hg''NH_2Cl + \underset{\text{Potash.}}{KHO}$$

$$= \underset{\text{Yellow mercuric oxide.}}{HgO} + \underset{\text{Ammonia.}}{NH_3} + \underset{\text{Chloride of potassium.}}{KCl.}$$

[§ Boiled with a solution of chloride of tin, it becomes grey and affords globules of metallic mercury.]

$$HgNH_2Cl + \underset{\text{Stannous chloride.}}{Sn''Cl_2} + \underset{\text{Hydrochloric acid.}}{2HCl}$$

$$= \underset{\text{Metallic mercury.}}{Hg} + \underset{\text{Sal-ammoniac.}}{NH_4Cl} + \underset{\text{Stannic chloride.}}{Sn^{iv}Cl_4.}$$

[§ Entirely volatilized by a heat under redness.] To this should be added the words "*without fusing.*"

Much of the white precipitate of commerce melts before volatilizing, in consequence either of consisting of "fusible white precipitate,"

$$HgH_2NCl, NH_4Cl,$$

which contains a smaller proportion of mercury; or in consequence of deficient washing whereby it retains some sal-ammoniac. (See PHARM. JOURN. s. s. Vol. X. p. 515.)

White precipitate is represented by most chemists as a compound formed from sal-ammoniac by the replacement of two atoms of hydrogen by one atom of mercury.

$$\underset{\text{Sal-ammoniac.}}{H_4NCl.} \qquad \underset{\text{White precipitate.}}{HgH_2NCl.}$$

By others it is regarded as an amido-chloride or chlor-amide of mercury; that is to say, as a compound in which the bivalent atom mercury is united to the two univalent atoms Cl and amidogen NH_2. In reality, however, these two views are identical, as an examination of the formulæ will show:—

First view. Second view.

$$\left.\begin{matrix}Hg''\\H_2\end{matrix}\right\}NCl \qquad Hg\left\{\begin{matrix}NH_2\\Cl\end{matrix}\right.$$

$$\text{or } HgH_2NCl. \qquad \text{or } HgNH_2Cl.$$

The univalent radicle NH_2 results from the removal of one atom of H from ammonia NH_3, just as the univalent radicle Cl is left on the removal of H from HCl:—

$$NH_3 - H = (NH_2)'.$$
$$ClH - H = Cl'.$$

HYDRARGYRUM CUM CRETA.—Grey powder, when kept for a long time, is apt to contain traces of mercuric oxide, formed by gradual oxidation of the mercury by contact, in a finely divided state, with the air. To detect this, the test is given in the Pharmacopœia. [§ The solution formed with hydrochloric acid is not precipitated by the addition of chloride of tin.]

DETECTION OF TURMERIC IN POWDERED RHUBARB AND YELLOW MUSTARD.

BY J. M. MAISCH.

Rhubarb root which has been attacked by insects or deteriorated in consequence of dampness and heat, is by some dealers sent to the mills and ground together with some sound rhubarb, or, if the colour is not sufficiently bright, turmeric is added, and the powdered rhubarb finds its way afterwards into the hands of the unsuspicious as a prime article. The fraud may be detected in a few minutes in the following manner:—

A small quantity of the suspected rhubarb is agitated for a minute or two with strong alcohol and then filtered. Chrysophanic acid being sparingly soluble in this menstruum, the brown yellow colour of the filtrate is due to the resinous principles of rhubarb mainly; if adulterated with turmeric, the tincture will be of a brighter yellow shade. A strong solution of borax produces in both tinctures a deep red-brown colour. If now pure muriatic acid be added in large excess, the tincture of pure rhubarb will instantly assume a light yellow colour, while the tincture of the adulterated powder will change merely to a lighter shade of brown red. The test is a very delicate one, and is based on the liberation of boracic acid, which imparts to curcumin a colour similar to that produced by alkalies, while all the soluble principles of rhubarb yield pale yellow solutions in acid liquids.

The same test, applied in the same manner, is also applicable to ground mustard seed. The seeds of *Sinapis alba* yield a powder of a yellow-grey colour, entirely distinct from the colour of yellow mustard met with in the market. Agitated with alcohol and filtered, a turbid solution is obtained, which assumes a bright yellow on the addition of the borax solution, and becomes colourless or whitish again on being supersaturated with muriatic acid. If the mustard be coloured with turmeric, the filtrate has a yellow tint, becomes brown-red by borax and retains the colour on the addition of muriatic acid. All the so-called yellow mustard of our commerce which I have had occasion to examine, whether ground in England or in the United States, contains turmeric. This practice ought to be discountenanced; for, under the yellow colour imparted by curcuma, adulteration of mustard may be carried on to an almost indefinite extent, if *strength* be supplied by the addition of a little capsicum.—*Amer. Journ. of Pharmacy.*

GLYCEROLE OF LUPULIN.

BY EMMET KANNAL.

Take of Lupulin, one troy ounce
Alcohol, six fluid ounces
Glycerin, nine fluid ounces
Curaçao cordial, one fluid ounce.

Mix the alcohol with two fluid ounces of glycerine, moisten the lupulin with the mixture, pack into a cylindrical percolator, and continue to add this mixture until eight fluid ounces of the percolate has passed; to this add the remainder of glycerine, previously mixed with the curaçao, and thoroughly mix the whole together. This will afford, by careful manipulation, a very fine preparation, miscible with any of the officinal syrups or tinctures, and possessing all the medicinal properties of lupulin. Dose, for an adult, one teaspoonful, representing $7\frac{1}{2}$ grains of lupulin.—*Amer. Journ. of Pharmacy.*

THE CHEMISTRY OF CALICO PRINTING.

BY JAMES BLAIR.

(*Continued from page* 1010.)

Clearing has for its object the removing of any taint or soiling contracted in the former operations, and also has a brightening action on some colours. It consists in padding the goods in a solution of bleaching powder at $\frac{1}{8}°$ to $\frac{3}{4}°$ Tw. (the less whites the stronger the liquor), then passing the goods through blue liquor, *i. e.* ultramarine and HO. The ultramarine may be mixed with the bleaching liquor. The goods on passing from the bleaching and bluing liquor are dried by passing over steam cylinders, then starched with solution of fine wheat starch and dried (if muslins tentered), calendered, folded, pressed.

Mordanted or Dyed Colours.—In these colours various metallic salts are printed on the cloth, and means adopted for rendering their base permanently fixed. This being accomplished, the goods are immersed in a bath containing the colouring principle, which in the operation of dyeing combines with the mordant in the cloth, forming a lake or other chemical compound with it. The principal styles of this class are:—1, Chrome oranges and yellows. 2, Logwood blacks. 3, Madder work. 4, Garancine work.

The first are, of course, produced by a lead salt and a soluble chromate. The other styles involve the use of madder, logwood, garancine, alizarine, Lima wood, bark, sumac, quercitron, galls, flavine, Persian berries, in the dye bath; salts of iron, alumina and tin, individually or mixed, constituting the mordants.

Chrome Orange.—The cloth is padded with solution of $MgOSO_3$ at 12 oz. per gallon and dried. The orange mordant, the basis of which is acetate of lead, is printed on, and by the $MgOSO_3$ converted into the insoluble sulphate of lead in the fibre of the cloth.

The cloth is then passed through a *cold* bath of 35 lbs. bichrome + 112 lbs. salt + HO till 26° Tw., which produces the yellow and insoluble chromate of lead.

The cloth is then worked in a vat of bichrome at 40° Tw. and CaO, boiling, which changes the yellow chromate into the orange chromate of lead; then cooled by rinsing in cold water, and then rinsed in lime water, rinsed in water, and dried.

Chrome Yellows are produced in the same way as the orange, but the treatment in the hot chrome and lime vat and the washing in lime water is omitted.

The operations of printing and dyeing madder, garancine and logwood are in some degree analogous, so may be conveniently described together. The mordants required for this style are acetate of iron and alumina, and chloride of tin, catechu, nitrate of copper, chloride of iron; the dyes—logwood, Lima wood, bark, sumac, quercitron, galls, flavine and Persian berries.

Mordants.—Acetate of iron, supplied to the printer in concentrated solution at 32° Tw., is made by passing the crude pyroligneous acid obtained from wood distillation direct from the still over iron turnings in the condenser. It invariably contains tarry impurities, which, however, in no way interfere with its usefulness; diluted less or more with HO it furnishes all the shades of black, purple and lilac produced by dyeing with madder, logwood, garancine, alizarine or mixtures of these dyes; thus black—1 volume FeOA and 1 volume HO = FeOA at 16°, thickened by boiling with flour + 2 oz. ASO_3; purple, weaker according to shade wanted; purple standard, FeOA, at 12° F., from 1 of purple standard to 8 of gum water to 1 to 36; covers 1 to 6 to 1 to 22; pads 1 to 24 to 1 to 54, figure thick with black gum; covers and pads boiled with flour. The solutions of acetate of iron are thickened for printing by flour or British gum.

Acetate of alumina is made by neutralizing sulphate of alumina solution with solution of acetate of lime, and is used neutral, or with a trace of free alum. Acetate of lime is made by saturating slaked lime with the crude acetic acid from wood distillation; it always contains tarry matters, which, for most work, are harmless. Cake alum supplied in slabs is nearly pure $Al_2O_3SO_3$, and must be free from iron.

This mordant, more or less diluted, furnishes all shades of red and pink with madder, garancine or alizarine. Where a very bright red is wanted, chloride of tin is mixed with the alumina mordant.

For pinks, the tin is sometimes omitted. The mordants are prepared for printing by thickening with starch or British gum.

Mixtures of alumina mord. and iron mord. give all shades of chocolate from madder, garancine and alizarine.

Catechu.—The valuable colouring principle of this substance is catechin, $C_7H_6O_3$, which bears a resemblance to tannin.

This substance furnishes, with small proportions of $CuONO_5$ and acetate of alumina, the various shades of brown.

A standard solution is made of catechu in HO, with NH_3Cl and acetic acid; this is thickened with gum gedda, and $CuONO_5 + Al_2O_3SO_3$ added just before printing.

The same colours, with FeCl substituted for Al_2O_3 acetate, furnish shades of drab.

Dyes.

Logwood contains hematoxyline $C_{15}H_{14}O_6$; it is soluble in HO and alcohol, and crystallizes with three atoms of water in colourless crystals. Air or oxygen do not act upon it, but *in presence* of NH_3 it is converted into hematein, $C_{16}H_{10}O_5$, which combines with the NH_3, forming hemateate of ammonia, thus $C_{16}H_{14}O_6 + O + NH_3 = C_{16}H_9(NH_4)O_5 + 2H_2O$; hematein, the actual colour is soluble in HO. It is an amorphous brown-red body, and forms crystallized salts with the alkalies and insoluble lakes with many metallic salts, thus, the lead lake is blue, the copper violet, tin violet, iron black,—these lakes have considerable stability.

Madder (*Rubia tinctoria*).—The valuable constituents of madder-roots are—rubian, $C_{28}H_{34}O_{15}$; alizarine, $C_{10}H_6O_3$; purpurine, $C_{30}H_{20}O_{10}$; and erythrosyme, a nitrogenous body.

Rubian, $C_{28}H_{34}O_{15}$, is regarded as the primary source of the valuable colouring-matters in the madder root. It is soluble in cold water and in alcohol, yielding yellow-coloured solutions having a bitter taste. By fermentation produced by the action of erythrosyme, and also by sulphuric acid, rubian is converted into alizarine and purpurine, glucose and resinous matters being also formed at the same time.

Alizarine, $C_{10}H_6O_3$.—This is the valuable colouring-principle of madder. It does not exist to any great extent in the root, but is a product resulting from the decomposition of the rubian by fermentation. Alizarine is insoluble in cold water, but soluble in boiling water, bisulphide of carbon, naphtha, etc. It sublimes at 228° F., and is obtained in golden-yellow needles. It forms stable compounds with alumina, iron and tin, and these lakes are insoluble in water and even in solutions of soap.

Purpurine, $C_{30}H_{20}O_{10}$, is another colouring-matter resulting from the decomposition of rubian. It forms definite compounds with alumina, iron and tin. These lakes are redder in shade than the corresponding alizarine compounds. They are insoluble in water, but are distinguished from the alizarine lakes by their solubility in solutions of soap and also in hot solutions of alum.

Garancine.—This is prepared by boiling ground madder roots with sulphuric acid and water. The acid is then removed by washing with water. By this treatment the rubian of the madder is converted into alizarine and purpurine, while the pecten and resinous matters are in great measure destroyed.

Bark, Sumac, Galls.—The valuable constituent of these substances is the tannin which they contain.

Persian Berries, Quercitron, Flavin.—The colouring principle of these substances is quercitrine, $C_{23}H_{10}O_{10}$, which forms lakes with several metallic bases. Its combinations with alumina and oxide of tin are yellow.

Lima Wood contains a colouring principle called braziline, $C_{20}H_{20}O_7$, which also forms lakes with many metallic salts.

The dye-stuffs are mostly used in conjunction with garancine, for the production of various shades of chocolate, red, orange, brown and drab.

The style of goods dyed direct from madder roots are black, purple, lilacs, red and pinks, and sometimes orange.

The goods are printed in the same manner as pigment or steam colours, but instead of colouring-matter, the ferrous or alumina mordants, already described, are printed on and the goods are dried. Simple figures are printed once, covers twice, and pads three times.

Ageing.—The dried goods are then aged. This operation is conducted in a building called a stove. This building is open from ceiling to floor; on the floor is an iron frame with light tin rollers about 9 feet long, and near the top of the building is a similar frame, but to every six tin rollers is a massive wooden roller (covered with flannel), propelled by gearing, and forming the traction-power for drawing the cloth through the machine. The cloth is passed in a continual line through this machine, entering at the bottom, ascending to the top, and descending again, after passing over each roller; and as the rollers are closely set, a great length of cloth may be in the machine at a time; and although moving rapidly, the time it is in the building is considerable. The stove is usually made so wide as to have two frames in the width; parallel with each frame is a 6-inch steam-pipe, along the entire length of which are many openings, expanding into wide tin funnels, hooded in such a way as not to project the steam which issues from them against the cloth. During the passing of the goods through the stove, volumes of steam are being thrown from the tin funnels into the chamber, and this steam is rapidly absorbed by the dry goods. The object is to keep the atmosphere as nearly saturated as possible without condensing into water. If the supply of steam is inadequate, the ageing will be ineffective; if too much steam, the dew-point will be reached, and water-drops falling on the goods will cause stains or blanks in the dyeing. The temperature is kept at about 80° F., the degree of saturation is regulated by observation of a wet and dry bulb hygrometer; dry bulb, 80°, wet 76°. The goods are then further aged by being loosely piled in a warm and moist room for 48 hours. In the ageing the action that takes place is as follows:—The greater part (but never the whole) of the acetic acid is volatilized, leaving behind the oxides of iron and alumina; in the case of the former, it is partly changed into sesquioxide, the result being partly ferrous and partly ferric oxide.

After ageing, the goods are submitted to the operation of *Dunging*, or *Cleansing*.—This has for its object the removal of the thickening and sightenings and from the excess of mordant used in the printing, secondly, from the excess of acid, and it has also been found to make the colours brighter and faster than they would otherwise be; it also has a remarkable influence in permanently fixing the mordants, and bringing them into the condition most favourable for the dyeing. For many years this process consisted in passing the goods through a bath of cow-dung in warm water, the insoluble and fibrous matters of it removing the excess of mordant and thickening, thereby preventing the staining of the whites, whilst its alkalinity neutralized the excess of acid in the mordant. The peculiar green colouring principle has also been thought to be efficacious in producing brighter and faster shades, either by combining with the mordant or by deoxidizing it. But perhaps the most valuable constituent of the dung was its phosphates, which rendered the mordants more permanent. Since the value of the phosphates has been ascertained, several chemical compounds have been substituted for the cow-dung; the principal of these are phosphates, silicates, arsenites and arseniates of soda and lime, or mixtures of these substances.

Dunging of Pink Pads.—The vat is charged with 2000 gallons of HO and 4 gallons of arseniate of soda at 74° Tw., and heated to 150° F., and the goods are passed through this solution. The strength of the liquor is maintained by addition of AsO_5NaO. The goods are then thoroughly washed in a washing machine.

Pink Plates.—Same as for pads, but a mixture of silicate of soda with $NaO\,AsO_5$.

Purple Pads.—These are run successively through three baths, all consisting of water and $CaO\,SiO_3$ in suspension, the first bath being strongest, the second weaker, and the third weakest; temperature 180° F.

Purple Plates.—Same bath as for pads, but heated only to 140°.

Chocolate Pads and Acid Garancines.—Three baths; first, with cow-dung and chalk; the others with cow-dung alone (chocolate, temp. 80°; acid garancine, 150°), all well washed afterwards.

Garancines.—Three baths, $NaO\,AsO_5 + NaO\,AsO_3$. Heat 150°.

Logwood Blacks.—Same dunging as garancines.

The goods having been dunged, and then thoroughly well washed, are ready for the next process.

Dyeing.—The dye-bath is usually made of iron, sometimes of wood, and is a rectangular cistern from 10 to 15 feet long by 4 to 5 feet wide and 4 to 7 feet deep; sometimes it is narrower towards the bottom. It is heated by a perforated steam pipe, which is placed along the bottom of the bath. There is usually a diaphragm in the middle of the bath, but which does not extend the full depth. This is to prevent the goods getting entwined, while at the same time it allows of their passing below the bottom of the diaphragm. Along the top of the bath is a winch or reel, which during the dyeing is kept revolving. The bath having been filled with the proper quantity of cold water, the goods are then entered; one end of each piece being passed over the reel, down the back of the diaphragm, below it, and then brought up in the front of it, is sewn to the other end. In this way twenty-five to fifty pieces may be placed in the bath. The proper quantity of ground madder-root is then thrown in, and if necessary a little $CaO\,CO_2$. The winch is then set in motion, and when the dye-stuff is thoroughly mixed in the bath, steam is turned on, and the temperature gradually and steadily raised to 200° or 180° F. in three hours. The chemical changes in the bath have already been described in speaking of alizarine. The rubian is converted into alizarine and purpurine, and these combine with the mordants; the pecten combines with the lime.

Garancines are dyed in a similar manner, but, owing to the colour all existing as alizarine and purpurine, the temperature can be raised more rapidly, and the dyeing is usually completed in two hours.

After dyeing madder, the cloth, besides alizarate of iron, Al_2O_3, and tin, contains purpurates of these bases, also sometimes pectates of the colouring matter and resinous matters, mechanically adhering to the surface of the cloth. These latter have all to be removed; and to effect this the goods are first washed in boiling water, then in cold water, and are then soaped. Black and purples are cleansed best in a bath of soap, and boiling HO, the treatment lasting one hour. Pinks one hour; commence cold, raised gradually to 212°; from 4 oz. to 10 oz. of soap are required for each piece, according to cloth and colours. The soaping dissolves the purpurates, but any impurities still remaining are removed by clearing. This consists in passing the goods through a vat at 190° F. of weak $NaOCO_2$ and bleaching powder. If pinks are of a bluish hue, it is removed by a weak bath of SnCl and sulphuric acid cold, washing, and then cleansing as above. Garancines are not regarded as so fast as madder work, arising from the fact that garancine usually contains a larger proportion of purpurine; and as this class of work is usually done at a cheaper rate than madder or alizarine, they are only very slightly soaped, so as to get the full advantage of the coloured purpurates. The combinations alizarine and purpurates form with the catechu mordants (producing brown and drab colours) are less stable than their combinations with FeO and Al_2O_3, and therefore brown and drab work is not soaped, but after dyeing is simply well washed in boiling and cold water, then dried, and cleared in the same way as steam colours, *i. e.* by padding with weak bleaching liquor and ultramarine blue. They are next dried, then finished. This consists in starching, calendering, folding and pressing.

I have thus endeavoured very briefly to give you the general outline of the operations involved in calico printing, an industry which must always be peculiarly interesting to chemists, as its rapid progress and present high degree of perfection arises, in no small degree, from the study and intelligent application of the science of chemistry. Nor can it be doubted that a clearer knowledge of the nature and properties of the various colouring matters will be accompanied by corresponding progress of this industry.

UNGUENTUM ACIDI CARBOLICI, LIQUOR SEDATIVUS AND EXTRACTUM FABÆ CALABARIENSIS.

The following formulæ for the preparation of Unguentum Acidi Carbolici, Liquor Sedativus and Extractum Fabæ Calabariensis have been furnished to the Chicago *Pharmacist* by Mr. C. Eredigke:—

Unguentum Acidi Carbolici.

Simple Ointment, benzoated, 4 pounds troy.
Carbolic Acid, crystallized, 3 ounces 96 grains.

Liquefy the acid by immersing the vessel containing it in hot water, and when the ointment is about congealing, add the acid, stirring well with a strong wooden spatula.

Each drachm contains three grains.

This ointment has been of excellent service in treating large superficial wounds, and ulcerating surfaces caused by burns, and in cutaneous eruptions of a parasitic nature.

Liquor Sedativus.

Tinct. Opii Camphor.
Spts. Æth. Nit. dulc.
Spts. Mindereri.
Syr. Simpl.
Aq. Camphoræ, ana part. æq.
M. et ft. solutio. Dose: A teaspoonful.

To increase the therapeutic effect of this mixture, 2 fl. ʒ of tinct. gelsemini, or 1 fl. ʒ of tinct. verat. vir. are often added to four ounces, to meet particular indications. This is a combination often prescribed in diseases complicated with febrile symptoms.

Extractum Fabæ Calabariensis.

Calabar Beans, 1000 grammes.
Alcohol of 0·864, 5000 grammes.

Reduce the beans to a fine powder, digest with a litre of alcohol over a water-bath, which must be maintained at a gentle heat for two hours. Then introduce the mixture into a displacement cylinder, and when the liquor, which results from this digestion, ceases to run, pour over the powder a second litre of boiling alcohol, and continue in this manner till the liquor passes off colourless. Mix the solutions, distil off the greater portion of the alcohol, and evaporate over a water-bath to the consistence of an extract. It is necessary to stir constantly towards the close of the operation, in order to render the product homogeneous.

1000 grammes of Calabar beans furnish from 25 to 30 grammes of extract, having a pilular consistence.

The above is the process for the preparation of this extract adopted by the French Pharmacopœia.

THE PHARMACY BILL.

MEETING OF MEMBERS OF THE PHARMACEUTICAL SOCIETY AT LIVERPOOL.

At a Meeting of the local members of the Pharmaceutical Society of Great Britain, held at the Royal Institution, Liverpool, on the 19th June, 1871, convened to consider the Bill before Parliament for amending the Pharmacy Act; Mr. John Abraham in the chair,—

It was moved by Mr. SHAW, and seconded by Mr. HORTON—

"That this meeting oppose the Bill now before the House of Commons, entitled an Act to Amend the Pharmacy Act of 1868."

It was moved as an amendment by Mr. ALPASS, seconded by Mr. PARKINSON—

"That this meeting is of opinion that the exemption of medical men, keeping open shops for the retailing, dispensing and compounding of medicines, from any regulations approved by the Privy Council, should be abrogated."

After a discussion, the amendment was withdrawn, and the motion having been put was negatived.

It was moved by Mr. ALPASS, and seconded by Mr. BARBER, "That this meeting approve of the action of the Council of the Pharmaceutical Society in the appointment of a Committee to watch the progress of the Bill, with a view to prevent the introduction of obnoxious clauses."

The motion was carried unanimously.

MEETING OF CHEMISTS AND DRUGGISTS AT LEEDS.

A Meeting of the Registered Pharmaceutical Chemists and Chemists and Druggists of Leeds was held at the Philosophical Hall on Monday, June 19; Mr. WILLIAM SMEETON, President of the Leeds Chemists' Association, in the chair.

Nearly forty chemists carrying on business in Leeds were present, and representatives from Bradford and Wakefield.

The following resolutions were carried unanimously:—

Moved by Mr. Edward Thompson, seconded by Mr. Edward Brown,—

1st. That this meeting, having carefully considered what would be the effect of the passing of a Bill now before Parliament, intituled "A Bill to Amend the Pharmacy Act, 1868," expresses its strong disapproval of the Bill, and indignation at the attempt being made to force it hastily through Parliament.

Moved by Mr. J. B. Stead, seconded by Mr. E. Yewdall,—

2nd. That a petition be presented to the House of Commons against the passing of the Pharmacy Bill and forwarded to Mr. Baines for presentation, and that the other Members for the borough, as well as those for the West Riding, be requested to support the prayer of the petition.

Moved by Mr. S. Taylor, seconded by Mr. P. Jefferson,—

3rd. That the following be appointed a delegation from this meeting to join a deputation to the Right Hon. W. E. Forster, in order to represent to him the strong reasons existing why this unnecessary, oppressive and unfair measure should not be passed,—

Delegation—Messrs. Smeeton, Brown, Thompson, Reynolds and Yewdall.

The meeting was unanimous in feeling, and on no previous occasion has any subject excited so much interest among the chemists of the town. Numerous speakers denounced the injustice and impolicy of the Bill, and deprecated the position brought about by those leaders of the Pharmaceutical Society who had misrepresented to the Government the views of their constituents.

A vote of thanks to the Chairman closed the proceedings.

MEETING AT GLASGOW.

At a Special Meeting of Chemists of Glasgow and surrounding towns (convened by circular), held in Anderson's University, 204, George Street, Glasgow, on Tuesday the 20th inst., the "Pharmacy Act Amendment Bill" was discussed, and the following resolutions unanimously agreed to:—

Proposed by Mr. T. Davison, seconded by Mr. John Jaap—

1. In the opinion of this Meeting, the conduct of Dr. Simon, Medical Officer of the Privy Council, towards the Pharmaceutical Society and the trade generally, has been marked by an arbitrariness and want of courtesy, which deserves our severest censure, in so far as Dr. Simon assumes that the Pharmaceutical Society is bound by the Act, 1868, to make regulations for the keeping, etc., of poisons,—an assumption which is not warranted by the fact, and also for the unseemly haste with which his Amended Act was forced through the House of Lords,—it having passed the third reading before the trade were made aware of its nature.

Proposed by Mr. H. Hart, seconded by Mr. A. Kinninmont—

2. That this measure, placing as it does, the interests of an entire trade at the mercy, virtually, of a single individual, from whose decision there is no appeal, is unjust, oppressive, and unworthy of the legislation of this country.

Proposed by Mr. Harvie, Airdrie, seconded by Mr Sinclair—

3. That the safety of the public is best secured by the proper education of the dispenser, and that this is ensured by the provision of the Pharmacy Act, 1868, —the only amendment necessary being an explanation or interpretation that its clauses, as to the sale and dispensing of poisons, extends alike to all shops, whether kept by surgeons or registered chemists.

Proposed by Mr. Black, seconded by Mr. Greig—

4. That a deputation be appointed by this meeting to wait upon the Vice-President of the Privy Council, in conjunction with other deputations from various parts of the country; and also, on account of the absence of Mr. Frazer, a deputy wait on Mr. Mackay before he leaves to attend the Council Meeting in London on Thursday.

Proposed by Mr. Carr, seconded by Mr. Fairlie—.

5. That an earnest appeal be made to the chemists throughout Glasgow and West of Scotland, to raise funds sufficient to carry out a thorough opposition to the Bill about to be brought before the House of Commons, and to defray the expenses of a deputation to London to explain and express the true opinions of the trade; and that the Secretary and Treasurer be appointed to carry out the same.

Proposed by Mr. James White, seconded by Mr. Lockhart (Maryhill)—

6. That the following petition be signed by all chemists in Glasgow and surrounding towns, and sent to Mr. Graham, M.P., for presentation to Parliament.

To the Honourable the Commons of Great Britain and Ireland in Parliament assembled.

The humble petition of the undersigned pharmaceutical chemists, chemists and druggists and others, inhabitants of Glasgow and surrounding towns, Scotland, carrying on business and duly registered under the provisions of the Pharmacy Act, 1868,

Sheweth:

That, whereas a Bill, intituled "An Act to Amend the Pharmacy Act, 1868," has been introduced into the House of Lords, has been rapidly passed through the various stages, and is now before your honourable House, that the said Act contains provisions which will inflict grievous annoyance and injury on your petitioners and others, and that such provisions are in nowise necessary, either for the safety of the public, or for the due carrying out of the provisions of the Pharmacy Act, 1868.

Your petitioners, therefore, humbly pray that your honourable House will refuse its sanction to the said amended Act, or postpone, for a reasonable time, its consideration, to enable evidence to be presented by which your petitioners will be able to satisfy your honourable House that the said amended Act is unnecessary and unjust.

And your petitioners will ever pray.

MEETING AT NEWCASTLE.

Copy of resolutions passed at a meeting of the Chemists and Druggists of Newcastle and Gateshead, held at the College of Medicine, Newcastle-upon-Tyne, June 20th, 1871; Jos. W. Swan, Esq., in the chair.

Moved by Mr. Buckett, seconded by Mr. Owen, and resolved—

That this meeting, having carefully considered a Bill now before Parliament, entitled "An Act to Amend the Pharmacy Act of 1868," protests against its provisions on the following grounds:—

1st. That the Bill, if passed, would, without reason, deprive the Pharmaceutical Society of rights carefully reserved to it in the Pharmacy Act of 1868.

2nd. That it would place in the hands of the Privy Council the power of making petty regulations for the storage of poisons, which, to be of any practical value, must be devised by those who know by daily experience the requirements of the case.

3rd. That as by far the largest proportion of the dispensing of poisons in England and Scotland—and in many parts of the kingdom a considerable portion of their retail sale—is undertaken in the surgeries of medical practitioners whom this Act would not affect, its provisions, whilst they would afford no material protection to the public, would involve a manifest injustice to the whole body of chemists and druggists.

4th. That the Pharmacy Acts now in force afford a better guarantee to the public that only really useful regulations respecting the keeping, dispensing and selling of poisons will be sanctioned than if the existing Acts were amended in the manner proposed by the said Bill.

Moved by Mr. Dobson, seconded by Mr. Alfred Brady, and resolved—

That this meeting adopt a petition to the House of Commons against the Bill, the same to be forwarded to the Right Hon. T. E. Headlam, with a request that he will present it and support its prayer, and that this meeting at the same time expresses its grateful acknowledgment to the Right Hon. T. E. Headlam for his services in promoting useful Pharmaceutical legislation.

Moved by Mr. H. B. Brady, seconded by Mr. Owen, and resolved—

That the Chairman (Mr. Swan) and the Secretary (Mr. B. S. Proctor) be requested to join the deputations from Leeds and other places in representing to Mr. Forster and such Members of Parliament as it may seem desirable to communicate with *personally* the views of the chemists of this district respecting the measure.

MEETING AT NOTTINGHAM.

At a large Meeting of chemists, held on Tuesday, June 20th, at the rooms of the Nottingham and Nottinghamshire Chemists' Association, the following resolutions were proposed and unanimously carried:—

That this meeting entirely disapproves of the Bill now before Parliament, entitled, "An Act to Amend the Pharmacy Act, 1868," and resolves that a petition be forwarded to the local representatives to be presented to Parliament, and would respectfully urge them to support the prayer thereof.

That this meeting, recognizing the necessity, at the present crisis, of united action in opposing the Pharmacy Bill, 1871, now before Parliament, would respectfully urge the Council of the Pharmaceutical Society to ask for delay, in order that its provisions may be fully considered.

That three delegates—Mr. Atherton, Mr. Rayner and Mr. W. Smith—from this meeting be appointed to attend the deputation to the Right Hon. W. E. Forster, at the House of Commons, on Thursday next.

MEETING OF THE HALIFAX CHEMISTS' ASSOCIATION.*

Mr. Stott, President, in the chair.

The meeting was called to consider the amended Pharmacy Bill of the Government. The Secretary stated that immediately on receipt of the Act he had entered into correspondence with the Manchester Defence Association and also with the borough members. Replies were read from both, stating that ample time would be allowed for chemists to become acquainted with the Bill.

The President stated that during the Annual Meeting he learned a good deal on the poison question, and found that the medical officer of the Privy Council was a most indefatigable servant, and had fully determined that something should be done; still he did not see what we could do otherwise than offer a strenuous opposition to the Bill. He doubted if the Council, being so divided, would pass any compulsory regulations, and then the sole power would be vested in Dr. Simon.

Messrs. Dyer, Farr, Jessop, Hebden, all spoke against the measure; and on the motion of Mr. Brook, seconded by Mr. Dyer, a petition against the Bill as read was adopted by the meeting, and ordered to be sent to the Right Hon. James Stansfeld for presentation to the House of Commons, and that Col. Akroyd be requested to support its prayer.

It was thought highly important that each individual chemist should correspond with the borough and county members, asking them to oppose the Bill, and that a deputation should join the Manchester one, to confer with Mr. Forster, the Vice-President of the Council.

* The report of this meeting was received without any date affixed.

DEPUTATION TO THE PRIVY COUNCIL.

A Deputation of Pharmaceutical Chemists and Chemists and Druggists from various parts of the kingdom had an interview with the Right Hon. W. E. Forster, Vice-President of the Council, at his official residence in Downing Street, on Thursday last. The Medical Officer of the Privy Council was present. Mr. Jacob Bright introduced the deputation. The following members of Parliament were present on behalf of the deputation:—Mr. Jacob Bright, the Right Hon. T. E. Headlam, Mr. Edward Baines, Mr. James Clay, Mr. S. A. Beaumont, Mr. Christopher Sykes, Mr. T. W. Mellor, Mr. Graham, Mr. A. O. Ewing, Mr. Pease and Mr. W. St. J. Wheelhouse. There were also present six members of the Council of the Pharmaceutical Society, the Secretary and the Solicitor to the Society.

Mr. Schacht, of Bristol, stated the object of the deputation, and the objections of the chemists and druggists throughout the kingdom to the proposed amendment of the Pharmacy Act were urged by Mr. Kinninmont, of Glasgow, Mr. Vizer, of London, and Mr. Brown, of Manchester, who spoke at considerable length.

Mr. Flux (Solicitor) then read a resolution which had been passed by the Council of the Pharmaceutical Society.*

Mr. Forster, in reference to the remarks of Mr. Schacht, pointed out that the figures produced showed that, exclusive of medical practitioners, only one-fourth of the persons keeping open shop as chemists and druggists were members of the Pharmaceutical Society, and it might be presumed that the remaining three-fourths comprised many who did not possess the educational qualifications which had been relied upon by the speaker as being all that were required for the protection of the public. Also that the remarks of a member of the Government quoted in favour of leaving railway companies and others free of restraint—while, perhaps, well founded as general rules for conduct—were subject to exceptions, and that the restraints imposed on railway companies respecting the carriage of gunpowder and other especially dangerous articles were a precedent for restraints on dealings in especially dangerous poisons.

In reference to the remarks of Mr. Vizer and Mr. Brown respecting the feeling of the trade and the absence of public opinion on the subject of compulsory regulations, he said that Parliament had already considered the matter and passed the existing Act, which, according to his reading of it, required that regulations should be framed and become compulsory; that the course pursued by the Society had been brought under his notice, and he thought it a duty, as a member of the Government, to see that, so long as the Act remained unrepealed, it should be carried out; that the Government had not been hasty either in framing the Bill now before the House of Commons or in passing it through the House of Lords,—that, in fact, the course of the Bill in the upper house was usual; and with regard to the future, he was quite prepared to afford every opportunity for discussion, and should be happy to give his most careful consideration to any suggestions which may be made for improvement of the Bill, but that he could not encourage the idea that the Bill would be withdrawn or postponed until next session; and then, with especial reference to remarks by Mr. Kinninmont, said that he individually thought that a *primâ facie* case existed for placing all persons keeping open shop for the retailing of poisons on an equal footing with respect to formalities, and he should be glad to consider any clause which might be framed with that object.

The deputation then thanked the Right Honourable gentleman for his courteous reception, and withdrew.

* See p. 1035.

The Pharmaceutical Journal.

SATURDAY, JUNE 24, 1871.

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

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

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

METHYLATED FINISH.

WE have frequently called attention to the difficulties experienced by chemists and others keeping methylated finish for sale, in obtaining *legal* finish from the makers, and not methylated spirit containing a small proportion of gum, and which legally is nothing but methylated spirit. The fact may not be known to many in the trade, but it is nevertheless a fact, that nearly all the so-called finish now sold contains in solution not more than one-tenth the required amount of gum resin. In proof of this we may state that of ten samples of finish recently examined, one only contained the proper proportion of gum, viz. three ounces in the gallon. The consequence is, that those persons who have no licence for the sale of methylated spirit, but who sell this spurious finish, are liable to a penalty of £50.

Why the makers of finish are so chary of adding the full proportion of gum, it is not difficult to explain. In the first place gum, though very cheap, adds to the price of methylated spirit, and its presence also prevents the dilution with water of spirit below a certain strength, and in the second place, as finish can be kept on any premises and sold in any quantity without being accompanied by certificate, the maker is not subject to the restrictions upon him as in the case of methylated spirit. It is well known to the makers that the so-called finish would be liable to seizure if kept by them in any place except in rooms allowed for storing methylated spirits.

They therefore are careful to keep the finish and methylated spirit together, and thus the excise authorities are compelled to recognize all as methylated spirit so long as it is on the trader's premises. As soon, however, as such finish comes into the possession of a person not licensed to keep methylated spirit, he is liable to a penalty for keeping methylated spirit without licence, and thus it is we constantly hear of chemists and others being prosecuted, whilst the makers, who are the actual offenders, escape punishment.

Even in a good cause there is always a certain amount of obloquy attaching to a man prosecuted in a police-court, and in cases like those now under review, the annoyance of so appearing is increased by the fact that though legally guilty, the defendant is morally innocent. Only recently a case of this kind was heard at Bow Street,* but Messrs. TAYLOR and CULVER, the defendants, were bold enough to go into court, in order to be able to take proceedings against the person who supplied them with this illegal finish. The magistrate, while compelled to convict, could not refrain from expressing his opinion that the defendants had been imposed upon. Now while one man may be found to have sufficient courage to go into court, there are scores, especially in country towns, where publicity of this kind is ruinous, who would pay any moderate sum rather than defend such a case, and this is a main reason why the manufacture of finish is carried on in such a loose manner.

To propose a remedy for this state of things which would be completely effectual, would be difficult indeed, but we venture to suggest that the excise authorities might, at certain fixed periods, have examinations made of the finish made by all the different manufacturers, and also more frequently cause the so-called finish to be examined after it has left the premises of the maker. By these two simple precautions the Board of Inland Revenue would become acquainted with those who did not comply with the law, and also be able to detect the maker sending out this spurious finish without certificates. This increased vigilance would, we are sure, do much to put a stop to the present practice, by causing manufacturers to exercise more care in complying with the excise regulations. The expense incurred in such supervision would be merely nominal, as there are less than a dozen makers of methylated spirit in the United Kingdom, and although there is no record in the official reports of the number of finish makers, we are strongly of opinion that the number does not exceed twenty.

Whilst suggesting increased vigilance on the part of the Excise, it is only fair to say that every needful precaution should be taken by the purchasers of finish, that they get the proper article supplied to them. The finish they buy should therefore be tested, and a simple mode of examination is based on the fact that gum resin is insoluble in water, although soluble in spirit. Thus, if to a small quantity of finish in a test-tube there be added about three times its bulk of water, it will be found that if the finish be properly made, the mixture becomes milky, and a curdy precipitate falls; but if the mixture remains transparent, or only slightly turbid, it does not contain the proper proportion of gum.

In cases like the present, great advantages would be obtained if those interested would combine to suppress such an illegal trade as that we have endeavoured to expose; and if the pharmaceutical chemists of the United Kingdom would take the trouble to turn their chemical knowledge to account for the protection of their own interests, prosecutions like

* See p. 1040.

those we have named would be few indeed; and wholesale houses would in this case, as in others, find very speedily, that the only satisfactory mode of doing business is to supply legitimate and proper articles to their customers.

THE HARVEIAN ORATION.

On Wednesday, in the Royal College of Physicians, Dr. Thomas King Chambers delivered the Harveian oration on the "Progress of Therapeutics," a subject on which few men have a better right to speak than the author of 'Digestion and its Derangements,' the 'Renewal of Life,' and of 'Indigestion Functionally Treated.' The accomplished lecturer gave a rapid survey of the history of medicine, showing the gradual liberation of medical practice from the doctrine that disease is something external to the body — something to be expelled from it by various kinds of treatment. Disease, he said, was now regarded as a condition,—a lowered one, indeed, but still a condition—of vitality. Towards the restoration of life to its normal standard, therapeutic aid was now directed; and the profession was becoming more successful in this undertaking from the teachings of "designed experiment" on the lower animals, and from the aid supplied by such instruments as the sphygmograph. With the multiplication of those aids, the lecturer anticipated a much more certain and satisfactory means of diagnosis, suggesting much more successful plans and treatment than had hitherto been adopted. Dr. Chambers brought his oration, amid loud applause, to an effective close; after which the President, in the name of himself and the Council, proceeded to award the "Baly medal" to the most distinguished cultivator of physiological science within the year. After a few appropriate observations in compliment to its late founder, and in reference to the encouragement it was calculated to give to scientific medicine, the medal, twenty guineas in value, was awarded to Dr. Lionel Beale.

AMERICAN REGULATION OF TRADE.

Now that "regulations" affecting trade are a matter of so much interest, the following account, given by Mr. T. Hughes, M.P., of the regulations in reference to the sale of alcoholic liquors in Massachusetts is worth notice:—

"As regards the 'liquor laws,' he did not stop to discuss the question of absolute prohibition, but spoke favourably of the stringent laws of Massachusetts, where a strict and direct legal supervision over the sale of liquor was exercised. A State Commissioner, appointed every year, controlled the sale of alcoholic liquors, which were vended by a small number of authorized agents—only four for the city of Boston. The agents could only obtain their supplies from the State Commissioner, and they were bound to record all their sales. All liquor had to be tested and certified by the public assayer. Persons known as confirmed drinkers might be reported by their friends or guardians, and it was a penal offence for the agents to sell to them, damages being also, in addition, recoverable from them by action. The practical result of these stringent laws was that a drunken man was nowhere to be seen, and that a thirsty one might have to travel through many streets before he came to a liquor shop."

SPECTROSCOPIC TEST FOR BLOOD.

We call our readers' attention to the letter on this subject by Mr. Stoddart, of Bristol, for, as an experienced observer, his opinion carries much weight with it, more especially since his remarks are free from any exaggeration.

The Managers of the London Institution, in accordance with the recommendation of the Annual Meeting of Proprietors, have resolved to afford opportunities during the ensuing season for the reading and discussion of communications on subjects of special interest in science, literature, commerce and the arts, provided they receive such offers as will ensure an adequate succession of suitable papers. It is believed that this proposed extension of the use of the commodious lecture theatre in Finsbury Circus will produce a series of attractive meetings, similar in character to those of the Society of Arts, but representing directly the business and thought of the City. It is not intended to restrict the reading and discussion of papers to the proprietors of the Institution, or to limit the range of subjects otherwise than by the provisions of the Royal Charter, which preclude theology and politics.

The Newark (New Jersey) Pharmaceutical Association has published a formulary of elixirs and unofficinal preparations, and issued it to the medical profession of that city, together with a circular in which they deprecate the prescribing of such fancy preparations of particular manufacturers, since many of them cannot contain the constituents they profess to contain. The members of the Association propose in all cases to dispense those made according to the formulæ agreed upon, unless a special preparation is indicated.

Mr. Robert Howard, whose death we chronicle this week, was the head of the well-known firm of Howard and Sons. He was a son of the celebrated meteorologist Luke Howard. Mr. Robert Howard had been in delicate health for some time, and died at his estate in Dorsetshire. He was buried in Abney Park Cemetery on the 8th instant.

We much regret to learn that Mr. Francis Sutton, of Norwich, has been suffering from a severe attack of pleurisy, which has left him in a very weak state.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

June 22nd, 1871.

MR. A. F. HASELDEN, PRESIDENT, IN THE CHAIR.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Greenish, Groves, Haselden, Hills, Mackay, Reynolds, Sandford, Savage, Shaw, Stoddart, Williams and Woolley:—

Deputations in reference to the proposed Pharmacy Bill from various parts of the country and London were received:—

A deputation of delegates to the Pharmaceutical Council upon their action with regard to the Amended Pharmacy Act, consisting of Messrs. Edwin B. Vizer, Pimlico; John Owen, Islington; Jas. Baynes, Hull; Atkinson Pickering, Hull; Chas. B. Bell, Hull; John Unthank, Wakefield; John Wade, London; Joseph W. Swan, Newcastle-on-Tyne; Robert Hampson, Manchester; Barnard S. Proctor, Newcastle; Thos. S. Johnson, Manchester; Thomas D'Aubney, London; Jabez Waterhouse, Ashton-under-Lyne; G. F. Schacht, Clifton; John Pitman, Bristol; W. W. Urwick, London; W. H. Waterhouse, Ashton; Job Preston, Sheffield; Edward Taylor, Rochdale.

Also a deputation from Glasgow, consisting of Mr. Alexander Kinninmont, Mr. Davison and Mr. Fairlie.

A Memorial from Pharmaceutical Chemists and Chemists and Druggists, requesting a Special General Meeting to be convened, was received, but, being informal, the request could not be complied with.

Moved by Mr. Reynolds, seconded by Mr. Greenish—

That the result of the interview of the Parliamentary Committee with the Right Hon. W. E. Forster is not satisfactory, and that considering the widely-felt objection to the proposed amended Pharmacy Bill, this Council determines to oppose the passing of such a measure in the House of Commons.

Amendment, moved by Mr. Sandford, seconded by Mr. Groves,—

That it is undesirable that this Council should commit itself to such decided opposition to the Bill; and that the course, proposed at the last special meeting of Council, of watching the progress of the measure and preventing the passing of obnoxious clauses, should be continued, the more especially as this course affords an opportunity of obtaining advantages for chemists generally.

For the Amendment—

Messrs. Groves, Haselden, Hills, Mackay, Sandford, Stoddart and Williams.

Against—

Messrs. Atherton, Betty, Bottle, Brown, Greenish, Reynolds, Savage, Shaw and Woolley.

The Amendment was therefore lost.

Mr. Carr was not present at the division.

On the original motion being again put, the following Amendment was moved by Mr. Groves, seconded by Mr. Hills:—

That any decided opposition to the Bill is unadvisable at the present time, as the appointment with Mr. Forster on Saturday might furnish reasons for viewing the Bill in a more favourable light.

For the Amendment—

Messrs. Groves, Haselden, Hills, Sandford, Stoddart and Williams.

Against—

Messrs. Atherton, Betty, Bottle, Brown, Greenish, Reynolds, Savage, Shaw and Woolley.

The Amendment was therefore lost.

Mr. Mackay did not vote and Mr. Carr was not present at the division.

On the original motion being again put, it was moved by Mr. Brown and seconded by Mr. Bottle:—

Resolved—That the words "during this Session of Parliament" be added to the original motion.

The original motion, with the addition of those words, was then put.

For the Motion—

Messrs. Atherton, Betty, Bottle, Brown, Greenish, Mackay, Reynolds, Savage, Shaw and Woolley.

Against—

Messrs. Groves, Haselden and Sandford.

The motion was therefore carried.

Messrs. Hills, Stoddart and Williams were present, but did not vote. Mr. Carr was not present at the division.

Moved by Mr. Savage, seconded by Mr. Bottle, and

Resolved—That the Secretary of this Society do attend with the deputation of chemists appointed to wait upon the Right Hon. W. E. Forster, at three o'clock to-day, and take with him a copy of the Resolution of this Meeting of Council and leave the same with Mr. Forster; and that the Society's Solicitor do also attend.

The Council then adjourned until five o'clock.

On the reassembling of the Council—

Moved by Mr. Brown, seconded by Mr. Shaw—

Resolved—That a memorial be drawn up by the Council of the Pharmaceutical Society and forwarded to the Vice-President of the Privy Council, urging the withdrawal or postponement of the Amended Pharmacy Bill.

It was then proposed by Mr. Woolley, and seconded by Mr. Betty,—

That this Council do petition the House of Commons not to pass the Bill now before it, intituled "An Act to Amend the Pharmacy Act, 1868," the seal of the Society being attached to the petition.

For—

Messrs. Betty, Brown, Greenish, Mackay, Reynolds, Shaw and Woolley.

Against—

Messrs. Haselden and Sandford. Messrs. Hills and Williams did not vote.

Moved by Mr. Shaw, seconded by Mr. Woolley,—

Resolved—That Messrs. Betty, Brown, Greenish and Reynolds be appointed a Committee to direct the operations of the Society in communicating with the Local Secretaries and members upon the subject of opposing the Bill.

The Council then adjourned till Saturday at 10.30 P.M.

Provincial Transactions.

NOTTINGHAM AND NOTTINGHAMSHIRE CHEMISTS' ASSOCIATION.

The Second Annual Meeting of this Society was held at the rooms, Britannia Chambers, Pelham Street, on Tuesday, the 30th of May.

The President, Mr. J. H. ATHERTON, who occupied the chair, alluded, in the course of a short address, to the satisfactory position of the Society, and complimented the members on the importance of the work of the past session, more especially in its educational efforts. The classes on chemistry, materia medica and pharmacy had been well attended by the associates, and with encouraging results. The increase in the number of members during the past year, and the unanimity of their meetings, were a source of congratulation to the Council. The President then mentioned the progress made in the formation of the museum, and expressed a belief that, at the commencement of the next session, a very fair number of specimens would be classified and arranged. After referring to the poison regulations proposed by the Pharmaceutical Society at the request of the Privy Council, the assistance to provincial associations by the parent society and other matters of special interest to the profession, he concluded by thanking the members for the invariable courtesy and kindness he had always received at their hands during the three years he had held the position as president of their society.

The Annual Report of the Council was then read and adopted.

A special vote of thanks was accorded to the lecturers, more especially to Mr. Mayfield, who conducted the class on materia medica and pharmacy.

The following officers were elected for the ensuing year:—*President:* Mr. J. H. Atherton, F.C.S. *Vice-President:* Mr. W. H. Parker. *Treasurer:* Mr. John Rayner. *Hon. Secretary:* Mr. R. Fitzhugh, F.C.S. *Council:* Messrs. Woodward, Jackson, Mayfield, W. Smith, Whitworth, F. White, Lewis and J. Jenkins.

Parliamentary and Law Proceedings.

A BILL INTITULED AN ACT FOR THE SAFE KEEPING OF PETROLEUM AND OTHER SUBSTANCES OF A LIKE NATURE.

Whereas it is expedient to consolidate and amend the law relating to the safe keeping of petroleum and other substances of a like nature:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited as "The Petroleum Act, 1871."

2. In this Act, if not inconsistent with the context, the following terms have the meanings hereinafter assigned to them; that is to say,

The term "borough" means—

In England any place for the time being subject to the provisions of the Act of the session of the fifth and sixth years of the reign of King William the Fourth, chapter seventy-six, "to provide for the regulation of municipal corporations in England and Wales," and the Acts amending the same;

In Scotland any royal burgh and any burgh or town returning or contributing to return a member or members to serve in Parliament;

In Ireland any place for the time being subject to the provisions of the Act of the session of the third and fourth years of the reign of her present Majesty, chapter one hundred and eight, "for the regulation of municipal corporations in Ireland, and the Acts amending the same;"

The term "person" includes a body corporate:

The term "Secretary of State" means one of her Majesty's Principal Secretaries of State:

The term "Lord Lieutenant" means the Lord Lieutenant of Ireland or the lords justices or other chief governors or governor of Ireland for the time being:

The term "harbour" means any harbour properly so called, whether natural or artificial, and any port, haven, estuary, navigable river, dock, pier, jetty, or other works in or at which ships do or can ship or unship goods or passengers:

The term "harbour authority" includes any persons or person being or claiming to be proprietors or proprietor of or intrusted with the duty or invested with the power of improving, maintaining, or managing any harbour:

The term "ship" includes every description of vessel used in navigation, whether propelled by oars or otherwise:

The term "Summary Jurisdiction Acts" means, as follows:

As to England, the Act of the session of the eleventh and twelfth years of the reign of her present Majesty, chapter forty-three, intituled "An Act to facilitate the performance of the duties of justices of the peace out of sessions within England and Wales with respect to summary convictions and orders," and any Acts amending the same:

As to Scotland, "The Summary Procedure Act, 1864:"

As to Ireland, within the police district of Dublin metropolis, the Acts regulating the powers and duties of justices of the peace for such district, or of the police of such district; and elsewhere in Ireland, "The Petty Sessions (Ireland) Act, 1851," and any Act amending the same:

The term "Court of Summary Jurisdiction" means and includes any justice or justices of the peace, sheriff or sheriff substitute, metropolitan police magistrate, stipendiary or other magistrate, or officer, by whatever name called, to whom jurisdiction is given by The Summary Jurisdiction Acts or any Acts therein referred to, or to proceedings before whom the provisions of the Summary Jurisdiction Acts are or may be made applicable:

The term "county rate" means as regards Scotland the county general assessment leviable in pursuance of "The County General Assessment (Scotland) Act, 1868."

3. For the purposes of this Act the term "petroleum" includes any rock oil, Rangoon oil, Burmah oil, oil made from petroleum, coal, schist, shale, peat, or other bituminous substance, and any products of petroleum, or any of the above-mentioned oils; and the term "petroleum, to which this Act applies," means such of the petroleum so defined, as, when tested in manner set forth in schedule one to this Act, gives off an inflammable vapour at a temperature of less than eighty-five degrees of Fahrenheit's thermometer.

4. Every harbour authority shall frame and submit for confirmation to the Board of Trade bye-laws for regulating the place or places at which ships carrying petroleum to which this Act applies are to be moored in the harbour over which such authority has jurisdiction, and are to land their cargo, and for regulating the time and mode of, and the precautions to be taken on, such landing. The harbour authority shall publish the bye-laws so framed with a notice of the intention of such authority to apply for the confirmation thereof. The Board of Trade may confirm such bye-laws with or without any omission, addition or alteration, or may disallow the same.

Every such bye-law when confirmed shall be published by the harbour authority, and may be from time to time altered or repealed by a bye-law made in like manner. Bye-laws under this section shall be published in such manner as the Board of Trade may from time to time direct.

If at any time it appears to the Board of Trade that there is no bye-law for the time being in force under this section in any harbour the Board of Trade may, by notice, require the harbour authority of such harbour to frame and submit to them a bye-law for the purposes of this section, and if such harbour authority make default in framing a bye-law and obtaining the confirmation thereof within the time limited by such notice, the Board of Trade may make a bye-law for the purposes of this section, and such bye-law shall have the same effect as if it had been framed by the harbour authority and confirmed by the Board of Trade.

Where any ship or cargo is moored, landed or otherwise dealt with in contravention of any bye-law for the time being in force under this Act in any harbour, the owner and master of such ship, or the owner of such cargo, as the case may be, shall each incur a penalty not exceeding fifty pounds for each day during which such contravention continues, and it shall be lawful for the harbour master or any other person acting under the orders of the harbour authority of such harbour to cause such ship or cargo to be removed, at the expense of the owner thereof, to such place as may be in conformity with the said bye-law, and all expenses incurred in such removal may be recovered in the same manner in which penalties are by this Act made recoverable.

5. The owner or master of every ship carrying a cargo consisting wholly or in part of petroleum to which this Act applies, on entering any harbour within the United Kingdom, shall give notice of the nature of such cargo to the harbour authority having jurisdiction over such harbour.

If such notice is not given, the owner and master of such ship shall each incur a penalty not exceeding the value of such ship and cargo.

6. Where any petroleum to which this Act applies—

(a) Is kept at any place except during the seven days next after it has been imported; or

(b) Is sent or conveyed by land or water between any two places in the United Kingdom; or

(c) Is sold or exposed for sale;

the vessel containing such petroleum shall have attached thereto a label in conspicuous characters, stating the description of the petroleum, with the addition of the words "dangerously inflammable," and with the addition,—

(a) In the case of a vessel kept, of the name and address of the consignee or owner:

(b) In the case of a vessel sent or conveyed, of the name and address of the sender:

(c) In the case of a vessel sold or exposed for sale, of the name and address of the vendor.

All petroleum to which this Act applies which is kept, sent, conveyed, sold or exposed for sale, in contravention of this section, shall, together with the vessel containing the same, be forfeited, and in addition thereto, the person keeping, sending, selling or exposing for sale the same, shall for each offence be liable to a penalty not exceeding five pounds.

7. Save as hereinafter mentioned, after the passing of this Act petroleum to which this Act applies shall not be kept, except in pursuance of a licence given by such local authority as is in this Act mentioned.

All petroleum kept in contravention of this section shall, together with the vessel containing the same, be forfeited, and in addition thereto, the occupier of the place in which such petroleum is so kept shall be liable to a penalty not exceeding twenty pounds a day for each day during which such petroleum is so kept.

This section shall not apply to any petroleum kept either for private use or for sale, provided the following conditions are complied with:—

(1) *That it is kept in separate glass, earthenware, or metal vessels, each of which contains not more than half a pint, and is securely stopped:*

(2) *That the aggregate amount kept, supposing the whole contents of the vessels to be in bulk, does not exceed three gallons.*

8. The following bodies shall respectively be the local authority to grant licences under this Act in the districts hereinafter mentioned; (this is to say,)

(1) In the city of London, except as hereafter in this section mentioned, the Court of the Lord Mayor and aldermen of the said city:

(2) In the metropolis (that is in places for the time being within the jurisdiction of the Metropolitan Board of Works under "The Metropolis Management Act, 1855"), except the City of London, and except as hereafter in this section mentioned, the Metropolitan Board of Works:

(3) In any borough in England or Ireland, except as hereafter in this section mentioned, the mayor, aldermen, and burgesses acting by the Council:

(4) In any place in England or Ireland, except as hereafter in this section mentioned, within the jurisdiction of any trustees or improvement commissioners appointed under the provisions of any local or general Act of Parliament, and not being a borough or comprising any part of a borough, the trustees or commissioners:

(5) In any borough in Scotland, except as hereafter in this section mentioned, the town council;

(6) In any place in Scotland, except as hereafter in this section mentioned, within the jurisdiction of police commissioners or trustees exercising the functions of police commissioners under any general or local Act, and not being a borough or comprising any part of a borough, the police commissioners or trustees:

(7) In any harbour within the jurisdiction of a harbour authority, whether situate or not within the jurisdiction of any local authority before in this section mentioned, the harbour authority, to the exclusion of any other local authority:

(8) In any place in which there is no local authority as before in this section defined, in England or Ireland, the justices in petty sessions assembled, and in Scotland any two or more justices of the peace for the county sitting as judges in the justice of peace court.

9. Licences in pursuance of this Act shall be valid if signed by two or more of the persons constituting the local authority, or executed in any other way in which other licences, if any, granted by such authority are executed. Licences may be granted for a limited time, and may be subject to renewal or not in such manner as the local authority think necessary.

There may be annexed to any such licence such conditions as to the mode of storage, the nature and situation of the premises in which, and the nature of the goods with which petroleum to which this Act applies is to be stored, the facilities for the testing of such petroleum from time to time, the mode of carrying such petroleum within the district of the licensing authority, and generally as to the safe keeping of such petroleum as may seem expedient to the local authority.

Any licensee violating any of the conditions of his licence shall be deemed to be an unlicensed person. There may be charged in respect of each licence granted in pursuance of this Act such sum, not exceeding five shillings, as the local authority may think fit to charge.

10. If on any application for a licence under this Act the local authority refuse the licence, or grant the same only on conditions with which the applicant is dissatisfied, the local authority shall, if required by the applicant, deliver to him in writing under the hand or hands of one or more of the persons constituting the local authority, a certificate of the grounds on which they refused the licence or annexed conditions to the grant thereof.

The applicant within ten days from the time of the delivery of the certificate may transmit the same to a Secretary of State if the application is for a licence in England or Scotland, and to the Lord Lieutenant if the application is for a licence in Ireland, together with a memorial, praying that notwithstanding such refusal the licence may be granted, or that the conditions may not be imposed, or may be altered or modified in such manner and to such extent as may be set forth in such memorial.

It shall be lawful for the Secretary of State, or the Lord Lieutenant, if he think fit, on consideration of such memorial and certificate, and, if he think it necessary or desirable, after due inquiry and a report by such person as he may appoint for that purpose, to grant the licence prayed for, either absolutely or with such conditions as he thinks fit, or to alter or modify the conditions imposed by the local authority; and the licence so granted, or altered and modified, as the case may be, when certified under the hand of a Secretary of State, or the Lord Lieutenant, shall be to all intents as valid as if granted by the local authority.

11. Any officer authorized by the local authority may purchase any petroleum from any dealer in it, or may, on producing a copy of his appointment, purporting to be certified by the clerk or some member of the local authority, or producing some other sufficient authority, require the dealer to show him every or any place, and all or any of the vessels in which any petroleum in his possession is kept, and to give him samples of such petroleum on payment of the value of such samples.

When the officer has by either of the means aforesaid taken samples of petroleum, he may declare in writing to the dealer that he is about to test the same, or cause the same to be tested, in manner provided by this Act, and it shall be lawful for him to test the same or cause the same to be tested, at any convenient place at such reasonable time as he may appoint, and the dealer or any person appointed by him may be present at the testing, and if it appear to the officer or other person so testing that the petroleum from which such samples have been taken is petroleum to which this Act applies, such officer or other person may certify such fact, and the certificate so given shall be receivable as evidence in any proceedings that may be taken against a dealer in petroleum in pursuance of this Act; but it shall be lawful for a dealer proceeded against to give evidence in proof that such certificate is incorrect, and thereupon the court before which any such proceedings may be taken may, if such court think fit, appoint some person skilled in testing petroleum to examine the samples to which such certificate relates, and to declare whether such certificate is correct or incorrect.

Any expenses incurred in testing any petroleum of such dealer in pursuance of this section shall, if such dealer be convicted of keeping, sending, conveying, selling, or exposing for sale, petroleum in contravention of this Act, be deemed to be a portion of the costs of the proceedings against him, and shall be paid by him accordingly. In any other event such expenses shall be paid by the local authority out of any funds for the time being in their hands, and in case the local authority are the justices out of the county rate as part of the expenses of such justices.

12. Any dealer who refuses to show to any officer authorized by the local authority every or any place or all or any of the vessels in which petroleum in his possession is kept, or to give him such assistance as he may require for examining the same, or to give to such officer samples of such petroleum on payment of the value of such samples, or who wilfully obstructs the local authority, or any officer of the local authority, in the execution of this Act, shall incur a penalty not exceeding twenty pounds.

13. Where any court of summary jurisdiction is satisfied by information on oath that there is reasonable ground to believe that any petroleum to which this Act applies is being kept, sent, conveyed, or exposed for sale within the jurisdiction of such court in contravention of this Act, at any place, whether a building or not, or in any ship or vehicle, such court shall grant a warrant by virtue whereof it shall be lawful for any person named in such warrant to enter the place, ship, or vehicle named in such warrant, and every part thereof, and examine the same and search for petroleum therein, and take samples of any petroleum found therein, and if any petroleum to which this Act applies be found therein, which is kept, sent, conveyed, or exposed for sale, in contravention of this Act, to seize and remove such petroleum and the vessel containing the same, and to detain such petroleum and vessel until some court of summary jurisdiction has determined whether the same are or not forfeited, the proceedings for which forfeiture shall be commenced forthwith after the seizure.

Any person seizing any petroleum to which this Act applies in pursuance of this section shall not be liable to any suit for detaining the same, or for any loss or damage incurred in respect of such petroleum, otherwise than by any wilful act or neglect while the same is so detained.

If any petroleum to which this Act applies is seized in pursuance of this section in any ship or vehicle, the person seizing the same may use for the purposes of the removal thereof, during twenty-four hours after the seizure, the said ship or vehicle, with the tackle, beasts, and accoutrements belonging thereto, and, if he do so, shall pay to tho owner thereof a reasonable recompense for the use thereof, and the amount of such recompense shall, in case of dispute, be settled by the court of summary jurisdiction before whom proceedings for the forfeiture are taken, and may be recovered in like manner as penalties under this Act may be recovered.

Any person who, by himself or by any one in his employ or acting by his direction or with his consent, refuses or fails to admit into any place occupied by or under the control of such person, any person demanding to enter in pursuance of this section, or in any way obstructs or prevents any person in or from making any such search, examination, or seizure, or taking any such samples as authorized by this section, shall be liable to pay a penalty not exceeding twenty pounds, and to forfeit all petroleum to which this Act applies which is found in his possession or under his control.

14. Her Majesty may from time to time make, revoke and vary Orders in Council directing this Act or any part thereof to apply to any substance, and this Act, or the part thereof specified in the Order shall, during the continuance of the Order, apply to such substance, and shall be construed and have effect as if throughout it such substance had been included in the definition of petroleum to which this Act applies, subject to the following qualifications:

(1) The quantity of any substance to which this Act is directed by Order in Council to apply, which may be kept without a licence, shall be such quantity only as is specified in that behalf in such order, or if no such quantity is specified no quantity may be kept without a licence;

(2) The label on the vessel containing such substance shall be such as may be specified in that behalf in the order.

15. All offences and penalties under this Act, and all money and expenses by this Act directed to be recovered as penalties, shall be prosecuted and recovered under the provisions of the Summary Jurisdiction Acts before a court of summary jurisdiction, and all necessary powers and jurisdictions are hereby conferred on such court in Scotland.

Provided as follows:

1. A court of summary jurisdiction shall not impose a penalty exceeding fifty pounds, but any such court may impose that or any less penalty for any one offence, notwithstanding the offence involves a penalty of higher amount.
2. The "Court of Summary Jurisdiction," when hearing and determining an information or complaint, shall be constituted in some one of the following manners; that is to say,—

(*a*) In England, either of two or more justices of the peace in petty sessions sitting at a place appointed for holding petty sessions, or of one of the magistrates hereinafter mentioned, sitting alone or with others at some court or other place appointed for the administration of justice; that is to say, the Lord Mayor or any alderman of the city of London, a metropolitan police magistrate, a stipendiary magistrate, or some other officer or officers for the time being empowered by law to do alone or with others any act authorized to be done by more than one justice of the peace:

(*b*) In Scotland, of two or more justices of the peace sitting as judges in a justice of the peace court, or of one of the magistrates hereinafter mentioned sitting alone or with others at some court or other place appointed for the administration of justice; that is to say, the sheriff of the county or his substitute, or the provost or other magistrate of a royal burgh, or some other officer or officers for the time being empowered by law to do alone or with others any act authorized to be done by more than one justice of the peace:

(c) In Ireland, within the police district of Dublin metropolis, one of the divisional justices of the police district of Dublin metropolis, and elsewhere of two or more justices of the peace in petty sessions, sitting at a place appointed for holding petty sessions.

3. The description of any offence under this Act in the words of such Act shall be sufficient in law.

4. Any exception, exemption, proviso, excuse or qualification, whether it does or not accompany the description of the offence in this Act, may be proved by the defendant, but need not be specified or negatived in the information; and if so specified or negatived, no proof in relation to the matters so specified or negatived shall be required on the part of the informant or prosecutor.

5. No conviction or order made in pursuance of this Act shall be quashed for want of form or be removed by certiorari or otherwise, either at the instance of the crown or of any private party, into any superior court. Moreover, no warrant of commitment shall be held void by reason of any defect therein, provided that there is a valid conviction to maintain such warrant, and it is alleged in the warrant that the party has been convicted.

6. All forfeitures may be sold or otherwise disposed of in such manner as the court may direct.

16. All powers given by this Act shall be deemed to be in addition to and not in derogation of any other powers conferred on any local or harbour authority by Act of Parliament, law, or custom, and every local authority and harbour authority may exercise such other powers in the same manner as if this Act had not passed; and nothing in this Act contained shall be deemed to exempt any person from any penalty to which he would otherwise be subject in respect of a nuisance.

17. The Acts mentioned in schedule two to this Act are hereby repealed to the extent in that schedule mentioned.

Provided that such repeal shall not affect any Order in Council made, or any licence granted, under any Act hereby repealed or any liability or penalty incurred in respect of any offence committed before the passing of this Act, or any remedy or proceeding for enforcing such liability or penalty, and every such order, so far as relates to the matters provided for by this Act, and every such licence shall have effect as if it had been made or granted under this Act.

SCHEDULES.

SCHEDULE ONE.

Directions for Testing Petroleum to Ascertain the Temperature at which it Gives Off Inflammable Vapour.

The apparatus to be employed in this test shall consist of:—

(*a*) An outer vessel of metal to contain water, about four inches in diameter and four inches deep, so contrived that some source of heat, such as a spirit-lamp or gas-burner, can be applied to it to heat the water which it contains:—

(*b*) An inner vessel of thin metal to contain the petroleum to be tested, about two inches in diameter and two inches deep, provided with an external rim or flange, above which the edge of the vessel shall rise about one-fourth of an inch, and by which it may be supported in the outer vessel so that its contents may be heated through the medium of the water.

The inner vessel for the petroleum shall be provided with a cover of thin metal fitting to the edge which rises above the rim or flange already described. This cover shall be about half an inch deep, so that its top may be half an inch above the surface of the petroleum to be tested. In the cover there must be fitted a Fahrenheit thermometer with a spherical bulb, in the scale of which ten degrees shall occupy at least half an inch in length; the thermometer must be placed in such a position that the bulb shall be just covered by the petroleum.

Near the front edge of the cover there shall be a circular opening, and through this the petroleum is to be tested. This opening is to be provided with a small moveable cover.

In making the experiment with this apparatus, the water in the outer vessel shall in every case be heated to eighty degrees Fahrenheit before the petroleum is put into the inner vessel. When the temperature of the water has reached eighty degrees, the source of heat must be withdrawn, the inner vessel must then be filled with the petroleum to be tested up to the level of the outer rim or flange, which must be indicated by a mark on the inside, and the cover with the thermometer must be put in its place. The source of heat must now be again placed beneath the vessel containing the water, and when the temperature of the petroleum in the inner vessel has reached eighty degrees, a small light should be applied to the circular opening in the cover; if the vapour be not ignited, that is if no pale blue flash or flicker of light be produced, the application of the light should be repeated at about every two degrees of increase of temperature until the flash of the ignited vapour be observed, and the temperature at which the first flash takes place is the temperature at which that sample of petroleum gives off an inflammable vapour.

In every case a second experiment shall be made to check the results obtained in the first.

A model of the apparatus described above is deposited with the warden of the standards, and reference shall be made to it in case of any difficulty or dispute as to the meaning of the terms employed in this description.

SCHEDULE TWO.

Year and Chapter.	Title.	Extent of Repeal.
25 & 26 Vict. c. 66.	An Act for the Safe Keeping of Petroleum.	The whole Act.
29 & 30 Vict. c. 69.	The Carriage and Deposit of Dangerous Goods Act, 1866.	Sections eight and nine.
31 & 32 Vict. c. 56.	The Petroleum Act, 1868.	The whole Act.

HOUSE OF LORDS.

Petroleum Bill.—*June* 16.—A Bill for the safe keeping of petroleum and other substances of a like nature was presented by the Earl of Morley, and read a first time.

June 20.—The Earl of Morley, in moving the second reading of the Petroleum Bill, explained that it consolidated the former Acts on the subject, and the existing regulations as to the landing, storage, etc.

HOUSE OF COMMONS.

Pharmacy Bill.—*June* 19.—The Pharmacy Bill, having passed the House of Lords, was brought in and read a first time. Ordered to be read a second time on Monday, June 26.

Weights and Measures (Metric System) Bill.—*June* 21.—The second reading of this Bill was deferred till Wednesday, July 26.

Illegal Sale of Methylated Spirit.

On the 8th instant, Messrs. Taylor and Culver, 173 and 175, High Street, St. Pancras, were prosecuted at Bow Street, before Mr. Vaughan, for selling methylated spirit without licence. They pleaded "Guilty," but wished the case to be heard on its merits, for the purpose of giving them power to take legal proceedings against the firm who supplied them with the article. It was proved in evidence that the sample sold to the Inland Revenue officer was part of a gallon of what had been purchased by the defendants as "Finish." The stone bottle containing the so-called "Finish" was produced, and a large gummed label having on it "Methylated Finish" was pasted on the bottle.

It was proved by Mr. Bannister, of the Inland Revenue Laboratory, that the sample purchased contained only 57 grains of gum in the gallon, instead of 1312½ grains. The magistrate said, that from the invoice handed in, and from the bottle produced, labelled as it was, he was of opinion the defendants had been imposed upon, but his duty was to fine the defendants in the mitigated penalty of £12. 10*s*., as the offence, had been fully proved. Mr. Dwelly, the Crown Solicitor, informed the magistrate he hoped to be able to prosecute the person who had supplied the illegal article, but at present there were certain difficulties in the way which he would not then name, but which, however, he hoped to remove in order to bring the proper person to punishment.

Sheffield County Court.—*Thursday, June 15th*, 1871.

(*Before* T. Ellison, Esq., *Judge.*)

Claim against a Chemist.

Thomas Ingall, saw carpenter, Oak Street, Heeley, sought to recover from Joseph John Riding, chemist and druggist, Devonshire Street, the sum of £50, damages alleged to have been sustained through the administration of improper medicine. Mr. Sugg appeared for the plaintiff, and Mr. Whitfield for the defendant, the case being tried before a jury.

In opening the case, Mr. Sugg said that the defendant had a branch establishment at Heeley, near to where the plaintiff resided. On December 17th, the plaintiff was passing along the street when the defendant, who was near his shop door, asked him how he was. Plaintiff replied that he was not very well, upon which the defendant recommended him to have a pennyworth of his pills. He took the pills as advised, but received no benefit from them, and he informed the defendant of this as he passed his shop the day but one afterwards. The defendant thereupon said that plaintiff's liver was out of order, and told him he had better take some of his liver pills, supplying him with a box containing twenty, and instructing him to take six per day. This he did for three days, and on the fourth morning he took the remaining two. After commencing work on the fourth day he was taken very ill while at work; he became very weak, his tongue was swollen, his teeth loose, and salivation set in. Up to that time he had been strong and healthy, and had never before required the aid of a medical man. So ill, however, did he become on that occasion, that he fell down and had to be taken home. Mr. Harrison, surgeon, who was sent for, attended him at his home for nearly a fortnight, and gave it as his opinion that his illness was the effect of extreme salivation. He then went into the Sheffield Hospital, where he was under the care of Mr. Taylor. For sixteen weeks the plaintiff was unable to work, and his health was not yet quite restored. Mr. Sugg contended that the defendant, if he represented himself as skilled in diseases such as he said the plaintiff was suffering from, ought to have given him proper directions in reference to the medicine, and in a case where salivation was deemed necessary, he should have called to see the plaintiff to ascertain how he was progressing. Instead of doing this, however, he sold him twenty mercurial pills, and never visited him, the result being the fearful illness to which he had referred.

The plaintiff was then called, and in his evidence bore out Mr. Sugg's opening statement. He said that during his illness he went to the Buxton Hospital, where his expenses were £1 per week; but in cross-examination by Mr. Whitfield, he admitted that he was a free patient at that institution, and explained that but for this fact he would have had to pay the amount named. On the fourth day of taking the pills he saw the defendant, who, on observing his state, said, "Oh dear! You must not take any more." He would not take any more for £100,000. He had lost twenty-six pounds of flesh in a month and four or five days. His earnings were £1. 11*s*. 7½*d*. per week.

Mr. Harrison, surgeon, said that when he was called in to attend the plaintiff he found him suffering from general debility and mercurial salivation. It was dangerous to take cold while salivation was going on. Medical men seldom administered mercury to salivation, but when they did so they looked carefully after the patient.

Mr. A. Taylor, house surgeon, Sheffield Public Hospital, said that when he first saw the plaintiff he was suffering from salivation, but rheumatism subsequently set in. Taking cold while under salivation would very likely lead to rheumatism.

Evidence was also given proving the plaintiff's absence from work and his previous good health.

Mr. Whitfield submitted that there was no case to go to the jury. The defendant did not hold himself out as capable of curing these diseases, but simply said, "Try my pills."

His Honour said that the law now was that every person who held himself out as following any skilful employment was bound to bring to the exercise of it a reasonable amount of skill. This applied to medical men, but not to chemists and druggists, who were simply sellers of drugs. There was a case in which a person went to a blacksmith to have a tooth drawn, and the latter broke his jaw. He sued for damages, and the Court held that there was no cause of action, because the man should not have gone to a blacksmith under such circumstances.

Mr. Sugg contended that in the present case the defendant had voluntarily placed himself in the position of a skilful practitioner.

His Honour said that a chemist and druggist could not administer medicines for profit. *If a man would be so great a fool as to go to a chemist* and take any pills that he might give him, it was his own fault. The matter having been argued at some length, his Honour decided that there was no case for the jury. If it had been a case in which a surgeon or qualified practitioner had done an injury to any one through not bringing to the performance of his duties that amount of reasonable skill which the law required, the action would have lain; but the defendant was merely a chemist and druggist, and held himself out to the world as simply a seller of drugs. *The ordinary practice of mankind was not to go to chemists and druggists as if they were medical men, but to go to a medical man first, obtain his advice, and then go to the chemist and druggist for the drugs that had been prescribed.* In the present case the plaintiff first went to the chemist and druggist, and took the pills which he recommended. It might be that the plaintiff had been injured by the pills, but in his opinion that made no case for the jury. *There was no skill required by a chemist and druggist*, who did not hold himself out as a possessor of skill. It was the same as if the plaintiff had taken pills which he (the Judge) had recommended as very valuable for his complaint. He (the Judge) would not be liable under such circumstances. He should therefore hold that there was no case to go to a jury, so that unless the plaintiff elected to be nonsuited, he should direct the jury to find a verdict for the defendant.

Mr. Sugg preferred a verdict for the defendant, in order that he might be in a position to appeal.

A verdict for the defendant was then entered.

LAMBETH POLICE COURT, *June* 16.

CHARGE AGAINST A "MEDICAL BOTANIST."

Charles de Badderley, 41, of Exeter Villas, Kennington Oval, described as a medical botanist, and Sarah de Badderley, 37, said to be his wife, were charged before Mr. Ellison on a warrant with having supplied ergot of rye with intent to cause the miscarriage of a woman. Mr. Poland appeared on the part of the Government to prosecute; Mr. Fullager was for the prisoners.

Counsel, in opening the case, said the attention of the police authorities had been directed to the parties, and their notice was called to the following advertisement in a publication called the *Medium*:—"Clairvoyance.—Madame de Badderley, the celebrated clairvoyante, at home for consultation from 2 to 7 daily. Communications by letter, stating age, etc. Morning consultations by appointment. Address 4, Exeter Villas, Kennington Oval, London, S.E."

Mrs. Hansard, a widow, who had acted under the direction of Mr. Inspector Clark, of the detective department of Scotland Yard, said that according to instructions she went on the 16th of March to 4, Exeter Villas, with the letter produced and a sovereign he gave her. She told the servant who opened the door that she wanted to see Madame de Badderley privately. The male prisoner came forward and said he was "Mr. de Badderley." The woman came, and he left for a time. Witness told the female prisoner that she was in great trouble through a niece, who was pregnant, and was in a situation in the country. The prisoner said she could do nothing until put into a state of clairvoyance; and the male prisoner, who came in, said he would perform the operation. He stared at her and made passes, and when she nodded that she was in a proper state of clairvoyance, he blindfolded her, and told witness to hold her hand while asking her any question, or her power would be gone. Witness took her hand and held it the whole time. She read the letter to her which had been given by Inspector Clark, and which was written as if it came from the niece to the aunt. Witness asked the female prisoner if she could do anything, and she said she would, when out of the clairvoyant state, give her some herbs to procure abortion. Witness rang the bell, and the male prisoner came into the room, took off the bandage from the eyes of the woman, who appeared to wake up. Witness then told her what she had said, and the woman requested the man to give her two bundles of herbs and also a box of the strongest pills. He went out of the room and shortly came back with a bundle of herbs. The female prisoner said the fee was usually a guinea, but as the girl was a servant it would be 10*s*. Witness handed to her the sovereign she had from Inspector Clark, and she gave it to the male prisoner, and he gave witness 10*s*. in change. The woman said that in case what she had given her did not act she was to call on the 21st of March, and then she would give her something stronger. Witness took the articles to the Horns Tavern, where she had appointed to meet the inspector, and gave them to him. On the 21st of March she met Sergeant Freeman at Kennington, and from him received a second letter and another sovereign. She went to the house of the prisoners. She again saw both prisoners together. She told the woman that the medicine had not acted. The woman was again put in a state of clairvoyance. Witness read a second letter, and asked her if she could give her the powders promised. She said she would, and they were to be taken in warm bitter beer before going to bed. The powders would be very strong, and she described what they could perform. She said, if required, she would make up a mixture, and her fee would be £5. Witness said the price was high, and the woman said she had great difficulty in getting the herbs. She afterwards told witness not to come before three weeks, as it was a critical case. Witness was also to write a note a day before she came, without giving any name, which was to be addressed to her as Madame de Badderley, as Mr. de Badderley had nothing to do with such cases, and she made up the medicine herself. When she had asked her all questions on her state she rang the bell, and the male prisoner brought her out of her state of clairvoyance, and after going out of the room he returned with four powders. Witness handed her the sovereign given to her and received 10*s*. in change. She gave, on leaving, the powder to Sergeant Freeman. On the 19th of April witness wrote a letter as directed, addressed to "Madame de Badderley," and on the next day called. Inspector Clark gave her a £5 note, of which he took the number, and the male prisoner told her a letter had been received, and madame would be ready in a few minutes. The female prisoner came in, and at her own request was put into a state of clairvoyance. While in that supposed state the woman startled her, and said a gentleman was passing her vision who frequently consulted her. She added that she did not know what she had to do with the witness's young friend who then came up before her. There was, she continued to say, life in the child, and it was a very critical case. She would give her the mixture, and advised that the girl should get away from her place, as it would make her cry out, and that would cause the domestics to become alarmed; a doctor would be sent for, and they would all be in a pretty plight. She said how powerful the mixture was, and what was left must at once be destroyed. The girl, she said, was to have every comfort, and to be careful not to take cold. Witness produced the £5 note, and she said to witness, "You stupid; why didn't you bring gold?" The other prisoner got change, and the woman put one guinea aside, she said, for his consultation fee.

Inspector Clark was called to confirm the last witness. He had planned the interview, and took the prisoners on Thursday morning into custody at the house.

Mr. Fullager reserved his cross-examination, and Mr. Poland asked for an adjournment. Mr. Ellison said there must be a remand.

Mr. Fullager asked that bail might be accepted, and produced a letter, he said, from a member of Parliament. Mr. Ellison said the case was far too serious for him to take bail. Mr. Poland said he should complete the case on the next occasion.

Review.

DR. DOBELL'S REPORTS ON THE PROGRESS OF PRACTICAL AND SCIENTIFIC MEDICINE IN DIFFERENT PARTS OF THE WORLD. Contributed by numerous and distinguished Coadjutors. Vol. II. London: 1871.

In spite of his somewhat unprofessional title-page, (if coadjutors are "distinguished'," there is surely no necessity for publishing the fact!) Dr. Dobell has carried out a good idea so satisfactorily as to make us regret that this, his second, volume will also be his last. As medicine advances, it becomes more and more requisite to record the net results of each successive year's observation and experience; otherwise, the fellow-workers in the same mighty field will be kept in ignorance of each other's achievements, and much time will be wasted in the solution of problems already solved.

As might have been expected, the report of the contributions made to medical knowledge in the United Kingdom is fuller and more satisfactory than those transmitted from other parts of the globe; Dr. Dobell having laboured under disadvantages similar to those of the compilers of our Army and Navy Blue-books, which are generally a year or two behindhand, owing to the distance of the several stations from headquarters. Among the most interesting papers in this section are those of Dr. W. W. Ireland (of Fisher Row, near Edinburgh), on the "Prevention of Disease;" the author being very instructive in the matter of disinfectants; of Dr. Adolphus Wahltuch (of Manchester), on "Materia Medica and Therapeutics," in which a good account is given of chloral hydrate; and of Mr. R. Brudenell Carter (Ophthalmic Surgeon to St. George's Hospital) on "Ophthalmology," in which he enounces Mr. Jonathan Hutchinson's doctrine that the hurtful effects of tobacco upon the optic nerves are most frequently seen in persons who abstain from alcohol; Mr. Hutchinson being "decidedly of opinion that the injurious influence of tobacco is, to some extent, counteracted by alcohol."

Of the contributions from abroad, undoubtedly the best, as well as most interesting, is that of Professor Villemin, of the Val-de-Grâce Hospital (translated by Dr. Ireland), on the progress of medical science in France. Surrounded by wounded, and beset by every kind of distraction during the latter part of 1870, Dr. Villemin has succeeded in composing a very instructive picture of what France has achieved in medicine during that eventful year. Germany is well represented by Dr. Julius Althaus; and Italy by Dr. Sammut, of Naples. Of the colonies, perhaps Australia, in spite of the fragmentary nature of its reports, appears in the most entertaining, if not instructive, light; a considerable portion of its contribution being occupied by a vindication of Professor Halford's mythical (and slightly dangerous) "cure for snake-bite." There is also a paper on the prevalence of consumption in Australia,—a subject on which there is no better authority than the writer, Dr. William Thomson, of Melbourne.

This volume is a great improvement on its predecessor. Dr. Dobell, indeed, as often happens, seems to have abandoned his undertaking just when he was acquiring that familiarity with its subject-matter and *modus operandi* which makes after-success not only certain but progressive.

Obituary.

On the 2nd of June, Mr. Robert Howard, F.C.S., Pharmaceutical Chemist, of Tottenham. Aged 70.

On the 4th of June, Dr. Frederic Holst, Ex-Professor of Medicine in the University of Christiania, and Honorary Member of the Pharmaceutical Society of Great Britain. Aged 79¾ years.

On the 9th of June, at his residence, Sloane Street, Chelsea, Charles Rowett Quiller, Pharmaceutical Chemist. Aged 42 years.

MEETINGS FOR THE ENSUING WEEK.

Tuesday ......*Royal Medical and Chirurgical Society*, at June 27. 8.30 p.m.

Wednesday ...*Society of Arts*, at 4 p.m.—Anniversary.

Friday ....*Royal Botanic Society*, at 4 p.m.—"Economic June 30. Botany." By Professor Bentley.

The following journals have been received:—The 'British Medical Journal,' June 17; the 'Medical Times and Gazette,' June 17; the 'Lancet,' June 17; the 'Medical Press and Circular,' June 21; 'Nature,' June 15; the 'Chemical News,' June 17; 'Gardeners' Chronicle,' June 17; 'Journal of the Society of Arts,' June 17; the 'Grocer,' June 17; 'Produce Markets Review,' June 17; the 'English Mechanic,' June 17; the 'Chicago Pharmacist' for May; the 'American Journal of Pharmacy' for June; the 'New York Druggists' Circular' for June; the 'Florist and Pomologist,' the 'Brewer's Guardian,' June 19; 'Bulletin de la Société Botanique de France,' vol. xviii. part 2; 'Neues Repertorium für Pharmacie,' vol. xx. part 5.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[256.]—LIQUID COCHINEAL.

R. Cocci Caeti,
Potass. Carbon.,
Potass. Tart. Acid.,
Pulv. Aluminis, aa ℥j
Aquæ ℥viij

Boil the cochineal, carbonate of potassium and water together, then add the alum and acid tartrate of potassium; when cold add half a drachm of rectified spirits of wine to each ounce and filter.

I have tried the above, and find that it keeps well.—H. J. B.

R. Carmine ℈j
Sp. Vini Rect. ʒvj
Aq. ℥iss
Liq. Potassæ ʒij
Syrupi ad ℥vj

Misce. C. S. S.

[259.]—DRYING SALVE.

R. Alum. Pulv.
Adipis Ppt. aa ℥iv
Ol. Origani ʒss
Ft. Ung.

[260.]—"PATE DE GUIMAUVE.

Take of Decorticated Marshmallow Root ℥iss
Distilled Water Oiss.

Macerate for twenty-four hours and strain. To this, add
Picked Gum Arabic, and
Finest White Sugar, of each ℥xv

Dissolve, and stirring constantly, evaporate to the consistency of thick syrup, add gradually the whites of 5 eggs well beaten up with
Orange Flower Water ℥iss

Evaporate (with constant stirring) until the "paste" is firm enough to be cut into tablets of the required shape.—J. T. C.

[261.]—"EXTRACT OF MALACCA BEAN."—Would any reader kindly oblige me with some information respecting the above extract? I was asked for it a few days ago, and my customer said that he had got it before. Would it be the St. Ignatius bean he meant?—G. S. Highmoor.

[262.]—TINCT. FERRI PERCHLORIDI.—I wish to elicit an opinion from some of your readers as to the advisability of substituting liq. ferri perchlor. for the tincture of the same, in dispensing, as during warm weather the latter will not keep without undergoing decomposition. In nine prescriptions out of ten the liquors may be used without causing the slightest difference from what would be the case were tincture used, and it has the advantage of being a stable preparation under all ordinary circumstances. I am convinced that medical men order the tincture solely as a matter of habit, and not from any superior therapeutical effect it may have.—H.

[263.]—DISPENSING PRICES.—A prescription was lately brought to me as follows:—

R. Tr. Veratriæ Virid. ʒij
Sumat guttæ iij ter die ex aqua.

Will some of your correspondents kindly favour me with their opinion as to what would be a reasonable price for the same?—H.

ORANGE FLOWER WATER.—It is a matter of daily experience that this water frequently becomes unsightly from the formation in it of flocculent vegetable matter, and sometimes this turbidity is accompanied by an unpleasant odour. I recently tried the experiment of adding to such a sample a crystal or two of permanganate of potassium, and was much gratified by the result. After standing for a few hours, the confervoid matter and the precipitated manganic oxide were easily removed by filtration, leaving the water colourless, bright and of faultless odour. The alkaline reaction produced in it was very slight, and would not, I think, interfere with the uses to which this water is applied.—J. F. BROWN, *Dover.*

NEW FIBRE FROM THE BARK OF THE MULBERRY TREE.—In reference to the paragraph on the above subject, on p. 995, a correspondent sends us an extract from a little biographical work by Alphonse Karr, in which the discovery is said to have been made by Serres more than three centuries ago, and asks whether it has lain dormant ever since. The authority for our statement, as mentioned at the time, was the *Journal of the Society of Arts*, but we shall be glad to receive any further information on the subject. The extract is as follows;—"Serres (naquit près Viviers en 1539) est le premier qui ait introduit en France la culture de cet arbre utile et annonça qu'on pouvait faire de belles étoffes avec l'écorce des arbres qu'on en retranche à la taille."

SAUCES.—As we have received several inquiries from correspondents concerning sauces, we extract the following formulæ from the *New York Druggists' Circular*, though we are unaware upon what authority they are given:—

No. 1.

White Vinegar 15 gallons
Walnut Catsup 10 gallons
Madeira Wine 5 gallons
Mushroom Catsup 10 gallons
Table Salt 25 pounds
Canton Soy 4 gallons
Powdered Capsicum 2 pounds
Allspice, powdered,
Coriander, powdered, aa 1 pound
Cloves,
Mace,
Cinnamon, aa ½ pound
Assafœtida ¼ pound, dissolved in Brandy 1 gallon.

20 pounds of hogs' liver is boiled for twelve hours with 10 gallons of water, renewing the water from time to time. Take out the liver, chop it, mix with water, and work it through a sieve; mix with the sauce.

No. 2.

White Vinegar 240 gallons
Canton Soy 36 gallons
Sugarhouse Syrup 30 gallons
Walnut Catsup 50 gallons
Mushroom Catsup 50 gallons
Table Salt, 120 pounds
Powdered Capsicum 15 pounds
Allspice,
Coriander, of each 7 pounds
Cloves,
Mace,
Cinnamon, of each, 4 pounds
Assafœtida 2½ pounds, dissolved in St. Croix Rum 1 gallon.

No. 3.

White Vinegar 1 gallon
Canton Soy,
Molasses, of each 1 pint
Walnut Catsup 1½ pint
Table Salt 4 ounces
Powdered Capsicum,
Allspice, of each 1 ounce
Coriander ½ ounce
Cloves,
Mace, of each ½ ounce
Cinnamon 6 drachms
Assafœtida ¼ ounce, in 4 ounces Rum.

M.

PINEAPPLE ESSENCE.

Chloroform 1 part (by volume)
Aldehyde 1 part
Butyrate of Ethyl 5 parts
Butyrate of Amyl 10 parts
Glycerine 3 parts
Alcohol 100 parts.

RASPBERRY ESSENCE.

Nitric Ether 1 part
Aldehyde 1 part
Acetate of Ethyl 5 parts
Formiate of Ethyl 1 part
Butyrate of Ethyl 1 part
Benzoate of Ethyl 1 part
Enanthylate of Ethyl 1 part
Sebacic Ether 1 part
Salicylate of Methyl 1 part
Acetate of Amyl 1 part
Butyrate of Amyl 1 part
Tartaric Acid 5 parts
Succinic Acid 1 part
Glycerine 4 parts
Alcohol 100 parts.

STRAWBERRY ESSENCE.

Nitric Ether 1 part
Acetate of Ethyl 5 parts
Formiate of Ethyl 1 part
Butyrate of Ethyl 5 parts
Salicylate of Methyl 1 part
Acetate of Amyl 3 parts
Butyrate of Amyl 2 parts
Glycerine 2 parts
Alcohol 100 parts.

AROMATIC ESSENCE OF GINGER.—Mr. W. R. Jones recommends the following as yielding a very agreeable form of tincture of ginger:—

℞. Ginger . . . . ℥xij
Cinnamon . . . . ℥j
Cardamoms . . . . ℥ss
Cloves . . . . ʒiij
Capsicum . . . . ʒij
All in moderately-coarse powder.
Alcohol . . . . Oiv.

Moisten the powder with a small portion of the alcohol, pack firmly into a percolator, and gradually pour on the remainder of the alcohol.—*American Journal of Pharmacy.*

ADULTERATION OF LARD.—A case of adulteration of lard, for the sake of obtaining a good colour, is reported in the *Canadian Pharmaceutical Journal* by Mr. E. B. Shuttleworth. Having purchased some beautifully white lard, he proceeded to use it for the preparation of ointment of nitrate of mercury. Upon adding the mercurial solution, instead of a citrine a decidedly saturnine colour was produced, developing in a short time to a full slate colour. The lard was consequently examined, and found to contain a large proportion of lime. Mr. Shuttleworth was afterwards told by a lard renderer that it was a common practice among lard dealers to mix from 2 to 5 per cent. of milk of lime with the melted lard. A saponaceous compound is thus formed that is not only pearly white, but will allow of the stirring in, during cooling, of 25 per cent. of water.

TINCTURA OPII CAMPHORATA (U.S.).—The following formula for the extemporaneous preparation of tinctura opii camphorata is published by Mr. W. Bamstead Jones, of Mount Airy, Philadelphia, in the *American Journal of Pharmacy*:—

Take of Tinct. Opii . . . . . . ℥iij ʒijss
Sp. Camphoræ . . . . . ℥j ʒiij
Ol. Anisi . . . . ʒij
Acid. Benzoic. . . . . . ʒij
Alcoholis, q. s. ft. . . . . Oij.
Mix.
Mel. Despumat. . . . . . ℥iv (troy)
Aquæ, q. s. ft. . . . . . Oij.

Mix the two solutions together, and filter through paper.

Correspondence.

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

The Lancet and the Spectroscope.

Sir,—All who are in the habit of reading the *Lancet* must have remarked the article in a recent number, containing some rather caustic reflections on the value of part of Dr. Letheby's evidence, in which he refers to the valuable aid afforded by the micro-spectroscope. Either the author of that article must have been misled, or not much accustomed to the use of that instrument.

The bands produced by the blood-spectrum are by no means "dim," but, on the contrary, well defined when observed by a properly-constructed instrument. The micro-spectroscopes generally sold differ greatly; most of them give rectangular fields, but all are not equally adapted for observing the spectra of coloured solutions. The prisms of one kind are so arranged that the colours run parallel to the short side, and are much diffused. The others are so arranged that the colours run parallel to the long side of the rectangle. The former arrangement is the best for observing the spectra of incandescent metals, and showing what the Editor of the *Lancet* terms "the China ribbon" lines. It will, however, give very inferior results with the absorption bands of coloured liquids. The latter arrangement, or that with the colours running parallel with the longest side of the field, will show them well defined, even when a very diluted solution of blood is used.

Moreover, this is not the chief point to be observed in micro-spectroscopy. It is not so much whether the bands are well defined, but their position in the spectrum. It must have constantly occurred to every observer that there are numerous examples that, when placed on the stage of the microscope one after another, appear identical even to the most practised eye and the closest scrutiny. But when two spectra are placed side by side by means of the auxiliary prism, the question of their identity is instantly decided. If the spectra be from the same substance, they will fit exactly one on the other; but if not, there would be what the geologist would term "a fault." Mr. Sorby and Dr. Letheby are quite correct when they say that no other known spectrum is like that of blood. If the spectrum of blood be observed by the terminal prism of the spectroscope, the spectrum of no other known substance, placed in juxtaposition by means of the side prism, will exactly match it.

The jargonium fallacy has nothing whatever to do with the question; and, before taunting Mr. Sorby, the Editor of the *Lancet* would do great service in the cause of medical jurisprudence if he would name any substance that would give a spectrum coincident with that of blood.

W. W. Stoddart.

"Orders" in Council.

Sir,—What have the Council been doing to Mr. Brown, that Mr. Brown should so rebuke the Council? Has it proved such a bear-garden since he joined it, that his rooted aversion to "regulations" has been forced to give way to the necessity of prescribing standing orders for its better government?

I can assure Mr. Brown that before he enjoyed the distinction of a seat at the Council, business was conducted there with the decorum and regularity to be expected from gentlemen and men of business. There was in those days no necessity to codify the very A B C of public affairs.

But "nous avons changé tout cela." The Council is now distracted by party feeling, its unity of action sadly impaired, its influence abated; and these new "standing orders" give token of still further disorganization.

As we read clauses 6, 7 and 8, we wonder if the object be to impeach the late President or to affront his successor, and a horrible apprehension takes hold of us that the next clause will follow—

"9. To prevent confusion, no two members will in future be allowed to speak at once, without express permission from the chair."

But seriously these exhibitions are calculated to bring the Council and the Society into contempt. How could the President have accepted a proposition imputing to him total incompetence for the duties of his office?

It is time that the better sense of the Society rose against the factious proceedings by which elections of Council have recently been dominated, and that our members should recollect that the Council which they appoint is not a parliament but a government.

Ex-Councillor.

Poison Regulations.

Sir,—I am surprised to find so much opposition to the "Poison Regulations;" however inconvenient and unpleasant it may be to submit to those regulations, my belief is that the more we have of Government inspection the better it will be for the *bonâ fide* chemist. The Pharmaceutical Council deserves the thanks of the community for swelling the tide of that progress which, in my belief, is gradually carrying us to the adoption of the continental system of Government appointment and supervision. That system, while making the number of pharmacists less, would place those left in a position to do without debasing the trade by dealing in farthing dips and methylated tincture of rhubarb.

A Country Chemist.

The Preliminary Examination.

Sir,—If "*B. S.*" intended his letter of the 13th ult. to be a reply to mine of the 29th April, I fail to see that he has answered one point in it. I urged two objections to the Modified men being admitted to the Minor.

1st. In justice to those who were not of age at the time of the passing of the Pharmacy Act, many of whom had been longer in the trade than some of those eligible for the Modified.

2nd. That no advantage would be gained by being admitted to the Minor without the Preliminary, as to a considerable extent the same knowledge requisite in the Preliminary is requisite in the Minor, in the translation of prescriptions.

"*B. S.*" is perfectly correct in saying that the Modified does "test the practical capabilities of the candidate," so far as it goes, but as to its being a "delusion and snare," it can neither be the one nor the other, as all who avail themselves of the Modified know, or ought to know what to expect.

To take the Modified with all its privileges (which "*B. S.*" admits to be as great as those enjoyed by pharmaceutical chemists), and then to cry out because they cannot skip the Preliminary, seems to me selfish in the extreme.

If in the words of "*Another Associate*" men desire pharmaceutical honours, they ought not to shrink from the conditions under which they are conferred.

June 7th, 1871. Minor Associate.

"*Live and Let Live.*"—The evils of the system are obvious, but at present it seems as if it must be left to work its own cure. If our correspondent can suggest any method of advantageously dealing with the subject, we should be glad to receive such communication from him.

"*Ice Cream Soda.*"—One of the ingredients in your mixture might raise the question whether you would not require to take out a spirit licence.

"*Kappa.*"—Articles on the subject of the removal of hydrocyanic acid from oil of bitter almonds will be found in the Pharm. Journ. 1st Ser. Vol. XIII. p. 277, and 2nd Ser. Vol. VI. p. 407.

F. W. Steel.—Our attention has been drawn to the same practice before, but it is one that we do not see that there is any possibility of interfering with.

"*Spes.*"—Boiled linseed oil is generally used for the purpose.

"*Country Druggist.*"—(1.) The mixture should be sent out in an ℥viij bottle, not filled up. (2.) We believe a perfumed carbolic acid has been advertised by several manufacturers.

[*** Carbolic acid readily dissolves essential oils, and it may be made aromatic in this way at discretion.—Ed. Pharm. Journ.]

Communications, Letters, etc., have been received from Mr. R. Palmer, Mr. E. Agnew, Mr. T. Perkins, Mr. Pardoe, Mr. W. Grey, Mr. R. Owen, Mr. Pollard, Mr. Procter, Messrs. Schoetensack, Mr. J. M'Innes, Mr. W. Wilkinson, Mr. J. Smith, Mr. H. B. Brady, Mr. Woolley, Mr. Coles, Mr. W. Hills, Mr. H. B. Poland, N. E. L. K., J. T. C., R. G. H., S. R., A. P. S., A. B. C., R. H. C. M., W. J. S., "Phyto," "Chemicus," "Ignotus," "Chemist."

INDEX TO VOL. I.

(THIRD SERIES.)

All Letters to the Editor will be found arranged under the head of "Correspondence;" Leading Articles, etc., under the head of "Editorial Articles and Notes."